ASME 2017
INTERNATIONAL DESIGN ENGINEERING TECHNICAL CONFERENCES & COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE

CONFERENCE
August 6–9, 2017

Cleveland, Ohio

Program

19TH INTERNATIONAL CONFERENCE ON ADVANCED VEHICLE TECHNOLOGIES (AVT)

37TH COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE (CIE)

43ND DESIGN AUTOMATION CONFERENCE (DAC)

14TH INTERNATIONAL CONFERENCE ON DESIGN EDUCATION (DEC)

22ND DESIGN FOR MANUFACTURING AND THE LIFE CYCLE CONFERENCE (DFMLC)

29TH INTERNATIONAL CONFERENCE ON DESIGN THEORY AND METHODOLOGY (DTM)

13TH ASME/IEEE INTERNATIONAL CONFERENCE ON MECHATRONIC & EMBEDDED SYSTEMS & APPLICATIONS (MESA)

41ST MECHANISMS AND ROBOTICS CONFERENCE (MR)

11TH INTERNATIONAL CONFERENCE ON MICRO- AND NANOSYSTEMS (MNS)

13TH INTERNATIONAL CONFERENCE ON MULTIBODY SYSTEMS, NONLINEAR DYNAMICS, AND CONTROL (MSNDC)

2017 ASME INTERNATIONAL POWER TRANSMISSION AND GEARING CONFERENCE (PTG)

29TH CONFERENCE ON MECHANICAL VIBRATION AND NOISE (VIB)

10TH FRONTIERS IN BIOMEDICAL DEVICES (BIOMED)

ASME
SETTING THE STANDARD

The American Society of Mechanical Engineers (ASME)

IDETC/CIE 2017 Chairs' Welcome

IDETC/CIE/

We are pleased to welcome everyone to the 2017 ASME International Design Engineering Technical Conferences and Information in Engineering Conference (IDETC/CIE) in Cleveland, Ohio, USA, August 6-9, 2017. This flagship meeting for the ASME Design Engineering Division and the Computers and Information in Engineering Division consists of the following 13 conferences:

- 19th International Conference on Advanced Vehicle Technologies (AVT)
- 37th Computers and Information in Engineering Conference (CIE)
- 43rd Design Automation Conference (DAC)
- 14th International Conference on Design Education (DEC)
- 22nd Design for Manufacturing and the Life Cycle Conference (DFMLC)
- 29th International Conference on Design Theory and Methodology (DTM)
- 13th ASME/IEEE International Conference on Mechatronic & Embedded Systems & Applications (MESA)
- 41st Mechanisms and Robotics Conference (MR)
- 11th International Conference on Micro- and Nanosystems (MNS)
- 13th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC)
- 2017 ASME International Power Transmission and Gearing Conference (PTG)
- 29th Conference on Mechanical Vibration and Noise (VIB)
- 10th Frontiers in Biomedical Devices (BIOMED)

Drawing largely from more than 1,100 abstracts submitted, the conference will encompass over 900 presentations, of which 780 are scheduled to be published post conference. This year's program will cover a wide range of session topics, complemented by plenary and keynote lectures, lively panel discussions, industry sessions, and informational tutorials and workshops addressing a rich spectrum of cutting-edge topics related to design, analysis, computation, and academic/professional success. IDETC/CIE will serve as a unique forum for sharing knowledge as well as for networking within academia, government, funding agencies, and industry.

A successful technical program depends on the many volunteers who serve as conference and program chairs, symposium and session chairs, and other organizational roles, as well as those who fill committee leadership positions, not to mention the authors and reviewers. We would like to warmly thank all who contributed to the success of this event, and give particular thanks to ASME staff whose hard work behind the scenes is greatly appreciated.

In addition to the excellent technical program, IDETC/CIE 2017 will offer a rich social program which features a reception in the Rock & Roll Hall of Fame.

We hope you will enjoy IDETC/CIE and your stay in Cleveland and that you find the experience rewarding.

General Co-Chair

Dumitru Caruntu

University of Texas Rio Grande Valley

General Co-Chair

Bogdan Epureanu

University of Michigan

Technical Program Co-Chair

Stefano Lenci

Polytechnic University of Marche

Technical Program Co-Chair

Matthew Brake

Rice University

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IDETC/CIE/

ACKNOWLEDGEMENT

ASME is a not-for-profit membership organization that enables collaboration, knowledge sharing, career enrichment, and skills development across all engineering disciplines, toward a goal of helping the global engineering community develop solutions to benefit lives and livelihoods. Founded in 1880 by a small group of leading industrialists, ASME has grown through the decades to include more than 140,000 members in 151 countries.

The Computers and Information in Engineering Division (CIE) covers a broad spectrum of resources relating directly to the use of computers, computing methods, software and information management in engineering by providing a forum for understanding the application of emerging technologies that impact critical engineering issues of representation, product design and product development, exchange, management and integration of information throughout the entire engineering product and process life-cycle.

The Design Engineering Division (DED) was founded in 1945, as the "Machine Design Division", part of the General Engineering Department of ASME. The objectives and function of this division are to promote the art and science of mechanical engineering design in the conception, evolution, and design of machinery and products, as well as mechanical design aspects of other phases of engineering. The division encourages and provides a forum for the interchange of ideas relative to design engineering through publications, presentations, discussion of technical papers, technical conferences and awards for outstanding achievement by individuals in the field of design engineering.

HAVE QUESTIONS ABOUT THE MEETING?

If you have any questions or need assistance, an ASME representative will be located at the registration area.

REGISTRANTS WITH DISABILITIES

Whenever possible, we are pleased to make arrangements for registrants with disabilities. Advance notice may be required for certain requests. For on-site assistance, please visit the registration area and ask to speak with a conference representative.

CLEVELAND

A guy named Moses Cleaveland, a surveyor from Connecticut, ventured west along Lake Erie many years ago and eventually landed in a forested area with the Cuyahoga River on one side and Lake Erie on another. He thought, "Yes, this would make a great place for a city!" And so, in 1796, Cleveland was officially born. (The "a" disappeared later.)

Cleveland isn't a place for people who follow the herd, it is for those who know how to have a good time. It's what happens when grit meets sophistication; a town where you can browse modern art inside a turn-of-the-century transformer station, hear the orchestra perform live inside the local hot dog joint and immerse yourself in the James Beard award winning cuisine. While you're here, nerd out among legendary artifacts like Michael Jackson's glove, at the Rock and Roll Hall of Fame or admire the 4,500 masterpieces displayed at the Cleveland Museum of Art. No matter what you do, be sure to enjoy Cleveland's world-class experiences without the world-class ego.

HOTEL / CONVENTION CENTER

All conference activities for this year's IDETC/CIE will be held in the Huntington Convention Center of Cleveland, located at 300 W Lakeside Avenue Cleveland, OH 44113. ASME has secured a block of sleeping rooms at the Hilton Cleveland Downtown which is adjacent to the convention center.

NAME BADGES

Please wear your name badge at all times. Admission to all conference functions will be approved by either a code on your badge or a ticket. Your badge also provides a helpful introduction to other attendees.

TICKETED FUNCTIONS

Access to workshops, tutorials, receptions and awards luncheons will be confirmed by tickets included in your registration packets. If you wish to bring a guest to an awards luncheon or reception, you must purchase an additional ticket accordingly. Guests are NOT permitted to attend technical sessions, workshops, tutorials or committee meetings. For questions regarding any possible ticketed items, you can ask a conference representative located in the registration area.

CONFERENCE PRESENTATIONS

Registered attendees will receive an email from ASME Publications prior to the start of the conference. This email includes a link to the online access for all scheduled presentations for IDETC/CIE. The official 2017 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference proceedings will be produced at the conclusion of the conference. Papers that are not presented on-site in Cleveland will be removed and not be published.

AUTHORS PRACTICE ROOM

Room 2 located on the Concourse Level will serve as the author practice room from 7:00am–5:00pm on Monday and Tuesday and from 7:00am–3:00pm on Wednesday. An LCD projector and screen will be available for authors to practice their presentations.

REGISTRATION

Registration will be located on the Exhibit level. On Site hours of operation are:

Sunday, August 6
7:00am–6:00pm

Monday, August 7
7:00am–6:00pm

Tuesday, August 8
8:00am–6:00pm

Wednesday, August 9
8:00am–3:00pm

Food Functions & Networking Activities

IDETC/CIE

BREAKFASTS

Please join our sponsors, conference organizers and division leadership each morning at 7:00am near the "Registration Foyer" for lite refreshments. Network with you fellow attendees and discuss new ideas, programs and activities.

Badges Required. Guests not permitted.

COFFEE BREAKS

All coffee breaks will take place according to the follow schedule:

	Morning Breaks	Afternoon Breaks
Monday, August 7	9:00am–10:00am 10:50am–11:00am	3:40pm–4:00pm
Tuesday, August 8	9:00am–10:00am 10:50am–11:00am	3:40pm–4:00pm
Wednesday, August 9	9:40am–10:00am	2:55pm–3:10pm

AWARDS LUNCHEONS

*One Division Awards Luncheon is included in each Full Conference Registration. Attendees have pre-selected a specific luncheon during the registration process. For those who would like to attend both luncheons, additional tickets may be purchased at the registration desk.

COMPUTERS & INFORMATION IN ENGINEERING (CIE) AWARDS LUNCHEON

Monday, 12:00pm–2:00pm
Location: Grand Ballroom B

Tickets Required.

Additional or Guest Tickets may be purchased for $50

DESIGN ENGINEERING DIVISION (DED) AWARDS LUNCHEON

Tuesday, 12:00pm–2:00pm
Location: Grand Ballroom B&C

Tickets Required.

Additional or Guest Tickets may be purchased for $50

RECEPTIONS

FUTURE-ME SOCIAL MEETUP FEATURING BEST PRACTICES FOR NETWORKING

Sunday, 5:30pm–7:00pm
Location: Room 26 A&B

Badges Required. Guests not permitted.

JUMP START your Conference Experience and Expand Your Professional Network! Join the ECE Programming Committee for a special 1 ½ hour networking experience of fun and socializing! Make new connections with other early career engineers sharing similar interests and/or catch-up with old friends to renew your friendships.

See page 38 for full details.

CONFERENCE RECEPTION AT THE ROCK & ROLL HALL OF FAME

Monday at 7:00pm–9:00pm
Busses will begin departing from the Lakeside Ave. entrance of convention center at 6:15pm

Tickets Required. Included in each Full Conference Registration.

Additional or Guest Tickets may be purchased for $75.

Enjoy yourself at this year's Conference Reception. Located on the shore of Lake Erie in downtown Cleveland, The Rock & Roll Hall of Fame recognizes and archives the history of the best-known and most influential artists, producers, engineers, and other notable figures who have had some major influence on the development of rock and roll. This year's reception will also include live music from Ohio's very own Roxxymoron.

STUDENT NETWORKING SOCIAL AND TEAM DESIGN COMPETITION

Tuesday, 5:40pm–7:00pm
Location: Grand Ballroom A&B or B&C

Badges Required. Guests not permitted.
This function is for student attendees only.

After a busy day of attending technical presentations, please join us for the Student Mixer and Team Design Competition. Meet old and new friends while engaging in a 30 minute competitive design experience. Exercise your creativity in a team setting to win a gift card so that you can continue your conversations over dinner. Refreshments will be provided and prizes are graciously sponsored by ASME's Design Engineering Division.

**It is with great appreciation that we acknowledge this year's sponsors.
Their support, generosity and collaboration allows this conference to maintain its high standards of excellence.**

SILVER SPONSORS

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ASME EXHIBITORS

ASME will be hosting an exhibit this year at IDETC/CIE! Please stop by and view our Journals and Standards, and also find out information about our Learning and Development courses and Membership. Also make sure to enter for your chance to win a 3D Pen. Sculpt 3D models by hand with this cordless 3D pen that utilizes built-in LED's to harden the ink as you draw! We look forward to seeing you!

ASME E-FESTS are three-day, two-night events that enable engineering students to expand their knowledge, test and showcase new skills and inspire innovation. E-Fests include a variety of elements such as ASME competitions (Student Design Competition, Human Powered Vehicle Competition, Innovative Additive Manufacturing 3D Competition, & Old Guard – oral & poster – Competitions), Lighting & Keynote Talks, Career & Professional Development Workshops, lots of networking opportunities, and most of all .... lots of fun! For more information and to see our video gallery, please visit: http://efests.asme.org/

19TH INTERNATIONAL CONFERENCE ON ADVANCED VEHICLE TECHNOLOGIES (AVT)

The Vehicle Design Committee (VDC) promotes innovative analytical, computational, and experimental investigations in the dynamics, control, and design of full vehicle systems, subsystems, and components. With the ever increasing demands on driving safety and autonomy, the human-vehicle interaction, advanced driver assistance systems, and connected vehicles are included also in the technical spectrum of topics addressed by the VDC. Our members perform fundamental and applied research, and implement technology for light/heavy vehicle design, modeling, and validation.

The VDC is pleased to welcome you to the 19th International Conference on Advanced Vehicle Technologies (AVT) held as part of the 2017 ASME-IDETC/CIE. This year, the AVT conference will consist of 5 symposia for a total of seven sessions in the areas of: vehicle systems dynamics and control; vehicle safety and ergonomics; vehicle design and development; vehicle electrification and powertrain; light vehicle and weight reduction; military and commercial ground vehicle development. We sincerely appreciate the time and services of these symposium organizers.

This year, the VDC is especially honored to host Mr. Martin Jones, Motorsport Market Manager of Moog Industrial Group, in the UK for the William Milliken Lecture. His lecture is entitled: “Tracing the Origins of the Automated ‘fly-by-wire’ Technology Used in Contemporary Formula 1 Cars”. We are also pleased to have Professor Xin Guan of Jilin University, who holds several key positions in the automotive sector of China including Vice President of the SAE of China and is Director of the Automotive Dynamics Branch of the National Automobile Standardization Committee. As the AVT Keynote Speaker, he will present: “Cyber-Proving-Ground for Intelligent Vehicles on Driving Simulator.”

Two awards with $500 cash prizes each are selected based on peer reviews and award committee’s ranking from the paper submissions in this year’s conference for the AVT Conference Best Paper and Best Student Paper. This year’s winners of the 2017 AVT Conference Best Paper and Best Student Paper Awards are, respectively: IDETC2017-67730, “A Semi-Analytical Tire Model for the Study of Tire/Rim Interaction on a Road Vehicle,” by Federico Ballo, Giorgio Previati, Massimiliano Gobbi, and Gianpiero Mastinu; and IDETC2017-67301, "Improvement of Harvesters for Tires by Means of Multi-Physics Simulation,” by Alberto Doria, Cristian Mede, Daniele Desideri, Alvise Maschio, and Frederico Moro.

We hope you all enjoy this year’s AVT Conference!

Chair

Lei Zuo

Virginia Tech

Program Chair

Schalk Els

University of Pretoria

Program Co-Chair

Alan Mayton

National Institute for Occupational Safety and Health Centers for Disease Control and Prevention

37TH COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE (CIE)

The Computers and Information in Engineering Division of ASME welcomes all IDETC/CIE Conference participants to the 37th Annual Computers and Information in Engineering Conference (CIE). This conference is a premier formal for international exchange of technical, scientific, and application knowledge related to the theory and practice of computing to support engineering activities. As such, this broad conference is organized around the four Technical Committees of the CIE Division:

- Advanced Modeling and Simulation (AMS)
  - Seung Ki Moon, Chair
  - Krishnanand Kaipa, Vice Chair
- Computer Aided Product and Process Design (CAPPD)
  - Chi Zhou, Chair
  - John Stueben, Vice Chair
- Systems Engineering and Information Knowledge Management (SEIKM)
  - Ashis Banerjee, Chair
  - David Jensen, Vice Chair
- Virtual Environments and Systems (VES)
  - Robert Wendrich, Chair
  - Pramita Mitra, Vice Chair

We welcome conference participants to become involved with our technical committees. Please contact the TC chair or vice chair or feel free to attend the TC committee meeting which will be held 6:00–7:00pm Tuesday evening. These meetings will be immediately followed by the CIE Division meeting which is also an open meeting. Room locations are announced in the program.

This conference provides a forum for researchers, practitioners, educators, and students from industry, academe, and government research labs to share their latest findings and challenges with the broader research community, foster collaborations, and build a sustainable research community.

The conference organizing team is pleased to report that there are 103 accepted papers from 136 submitted full papers. A total of 95 papers

- Advanced Modeling and Simulation (AMS) General
- Computer-Aided Product and Process Development (CAPPD) General
- Virtual Environments and System (VES) General
- Systems Engineering, Information and Knowledge Management (SEIKM) General
- AMS: Simulation in Advanced Manufacturing
- AMS: Uncertainty Quantification in Simulation and Model Verification & Validation
- AMS: Computational Multiphysics Applications
- AMS/SEIKM/CAPPD: Design, Simulation and Optimization for Additive Manufacturing
- CAPPD: Emotional Engineering
- CAPPD: Human Modeling: Methods and Applications in Engineering
- Design for Resilience and Failure Recovery (with Design Automation Conference)
- SEIKM: Design Informatics
- SEIKM: Knowledge Capture, Reuse, and Management
- SEIKM: Systems Engineering
- SEIKM: Smart Manufacturing Infomatics
- VES: Methods, Processes and Strategies

were ultimately submitted and accepted which are organized into 15 symposiums consisting of 25 total sessions:

Additionally, we have organized five panels of leading experts in their respective fields to provide discussions and forums for current topics of relevance:

- VES Panel: Advancement in Digital Technology Systems, Usage of VR and Tools for Design Engineering
- AMS Panel: Additive Manufacturing in Aerospace, Defense and Automotive Industries: Status and Promises
- SEIKM Panel: Smart and Connected Vehicles – Coming Soon to a Place Near You!
- CIE Panel: From a Researcher/Technology Developer to an Advanced Technology Visionary/Facilitator – A Perspective
- CIE Panel: Manufacturing Today

We are also delighted to offer an Industry Presentation session entitled Computer and Information Technology Trends, as well as a poster session for graduate students to afford them the opportunity to present their current work to the research community and get their feedback on Tuesday Afternoon. The graduate student posters also will be on display throughout the conference, so please feel free to stop by and talk with our future colleagues.

(Continued on next page)

Welcome Letters

IDETC/CIE

We are pleased to offer Dr Gahl Berkooz as the CIE keynote speaker on Monday, August 7 at 11:00am immediately before the CIE luncheon. Dr. Berkooz is the Chief Data and Analytics Officer for Acorns, whose mission is to make Americans financially empowered by financial literacy, saving, and investing. He has prepared a fascinating talk on Data, Analytics, and Internet of Things: the perfect storm and some Grand Challenges.

On Monday afternoon, we will hold our annual awards luncheon at which we will present the conference best paper awards and the Division research, leadership, service, lifetime achievement, and best dissertation awards.

We would like to thank all the authors for submitting papers to share their work. We would like to thank the reviewers for providing valuable feedback to help improve the reporting and the quality of the conference and the session chairs and co-chairs that worked on coordinating the paper review process. It is impressive to note that well over 400 reviews were submitted this year.

As always, all participants are encouraged to join the technical committees and the Division meetings on Tuesday evening. Our community will continue to grow and flourish with your active participation as we work to define our future vision this coming year.

We welcome you to the 37th Computers and Information in Engineering Conference.

Chair

Ian Grosse

University of Massachusetts

Program Chair

Cameron Turner

Clemson University

43RD DESIGN AUTOMATION CONFERENCE (DAC)

Welcome to the 43rd ASME Design Automation Conference (DAC)!

The DAC technical program spans the breadth and depth of design automation research. After a rigorous peer review process, 113 papers in 19 active research areas were accepted this year to the conference (approximate acceptance rate of 73%).

In addition to our technical sessions, we will be hosting a keynote symposium under the theme "Data-Driven Design." Co-organized by Kemper Lewis and Scott Ferguson, the symposium will feature internationally recognized keynote speakers in a mix of seminars and lightning talks, followed by an interactive Q&A session, focusing on the engineering design challenges associated with data-driven design and design analytics.

We will also be presenting the Ford Best Paper Award of the DAC at the beginning of the symposium; this year's winner is DETC2017-67643: "Bayesian Network Structure Optimization for Improved Design Space Mapping for Design Exploration with Materials Design Applications," by Conner Sharpe, Clinton Morris, Benjamin Goldsberry, Carolyn Seepersad and Michael Haberman (DAC 11-1).

Also, please join us for our DAC committee meeting on Tuesday evening. This year, we will feature a warm dinner buffet during our meeting, so please do not make any other dinner plans! We look forward to having our community come together, meet old friends and make new ones.

From the accepted papers, nine were identified as "Papers of Distinction." These papers of distinction (excluding the paper that won the Best Paper Award) are listed below (ordered by paper number and including the assigned session):

- DETC2017-67319: "Design of a Reconfigurable Dynamic Testbed for Co-Design Method Validation," by A. Deshmukh, D. Lohan and J. Allison (DAC 2-1)
- DETC2017-67500: "Product Family and Product Platfrom Bench-marking with Commonality and Variety Indices," by T. Simpson (DAC 17-1)
- DETC2017-67909: "Iterative Most Probable Point Search Method for Problems with Mixture of Random and Interval Variables," by H. Cho and K. Choi (DAC 19-1)
- DETC2017-67976: "Enhanced Gaussian Process Metamodeling and Collaborative Optimization for Vehicle Suspension Design Optimization," by S. Tao, K. Shintani, R. Bostanabad, Y. Chan, G. Yang, H. Meingast and W. Chen (DAC 16-1)
- DETC2017-68173: "Exploration of Solution Space to Study Thermo-mechanical Behavior of AA5083 Al-Alloy During Hot Rolling Process," by A. Nellippallil, R. Shukla, S. Ardham, G. Goh, J. Allen and F. Mistree (DAC 19-2)
- DETC2017-68302: "A Design Methodology for a Flexible Wind Turbine Blade with an Actively Variable Twist Distribution to Increase Region 2 Efficiency," by H. Nejadkhaki and J. Hall (DAC 5-1)
- DETC2017-68309: "Modeling Shear Performance of High-Speed Ridged Nail In Aluminum Joints," by S. Siripurapu and A. Luscher (DAC 11-2)
- DETC2017-68373: "Concept Drift and Evolution Detection in Fusion Diagnosis With Evolving Data Streams," by A. Abdolsamadi and P. Wang (DAC 8-2)

Authors from our community will present these and many other excellent papers throughout the conference. We encourage you to support your colleagues by attending the presentations and joining in the discourse!

Last, but surely not least: organizing the conference requires the assistance of a number of individuals. We are particularly grateful to all session organizers and paper review coordinators:

James Allison, Diego Andrade, Jesse Austin-Breneman, Amy Bilton, Mark Bryden, Matt Campbell, Wei Chen, Shikui Chen, Seung-Kyum Choi, Souma Chowdhury, Charlotte deVries, Guang Dong, Xiaoping Du, Bryony DuPont, Georges Fadel, Scott Ferguson, Wentao Fu, Paul Grogan, James Guest, John Hall, Babak Heydari, Chris Hoyle, Chao Hu, Zhen Hu, Horea Ilies, Nathan Johnson, Ritesh Khire, Ikjin Lee, Kemper Lewis, Mian Li, Po Ting Lin, Matt Lynch, Nordica MacCarthy, Erin Macdonald, Christopher Mattson, Ali Mehmani, Seung Ki Moon, Beshoy Morkos, Zissimos Mourelatos, Saigopal Necaturi, Julian Norato, Andrew Olewnik, Jitesh Panchal, Matt Parkinson, Rahul Renu, Carolyn Seepersad, Daniel Selva, Kristi Shea, Tim Simpson, Andres Tovar, Conrad Tucker, Cameron Turner, Christopher Vermillion, Krishna Vijayaragharan, Pingfeng Wang, Yan Wang, Katie Whitefoot, Christopher Williams, Zhimin Xi, Hongyi Xu, Nita Yodo, Jie Zhang

On behalf of the entire DAC community, we welcome you to Cleveland and another enjoyable and thought-provoking Design Automation Conference.

Chair

Harrison Kim

University of Illinois

Program Chair

Christopher Mattson

Brigham Young University

14TH INTERNATIONAL CONFERENCE ON DESIGN EDUCATION (DEC)

On behalf of the Design Education Committee we welcome you to the 14th annual International Conference on Design Education. The focus of this conference is on design education among educators, practitioners and researchers.

We have three special events this year. Our first keynote presentation is by Dr. Sunand Bhattacharya from Autodesk, Inc. He will present "Radical Collaboration by Design in Engineering Education." He is planning to discuss the future of making and learning things which exists at the nexus of (1) design, make, use; (2) infinite computing, digital manufacturing, and internet of things; and (3) creating places, things, and media convergences. He will talk about the importance of successful integration of this curricular effort into disciplines of engineering and design for bridging the gap between education and industry expectations. This presentation is scheduled for Monday morning at 11:00am; please check the Technical Program for the location.

Our second keynote presentation is by Dr. Karen E. Crosby an NSF/DUE Program Director. She will speak on "Overview of Undergraduate STEM Education Research and Related NSF Funding Opportunities." She will present various funding opportunities to support STEM education projects offered through the Division of Undergraduate Education (DUE) at the National Science Foundation (NSF). She will also culminate with helpful hints and fatal flaws to consider when developing proposals. The keynote will be Tuesday morning at 9:10am; please check the Technical Program for the location.

Our third special event is a panel session organized by Dr. Daniela Faas on "To Be a Makerspace or Not to be: Panel on Maker Space and Machine Shop Synergies." This panel will examine maker spaces as a learning environment and how they are integrated across the fabrication continuum at universities. The panel will address questions such as "Can traditional shops and maker spaces mutually co-exist?" and "What is the maker space beyond making?" The panel session will be Monday at 4:00pm; please check the Technical Program for the location.

The emphasis of DEC's technical sessions is on "Design Education in the Undergraduate Curriculum," "Research Methods in Design Education," "Evaluations and Assessment in Design Education," and "Fabrication and Making Things in Design Education." This year's DEC Program consists of four technical sessions. This year we received 23 submissions. The acceptance rate is about 85%. Refer to the conference Technical Program for the times and locations for the sessions.

A Best Paper has been selected for the 2017 DEC Conference: it is DETC2017- 67339 "Quantifying the Mismatch Between Course Content and Students' Dialogue in Online Learning Environments" by Sunghoon Lim, Conrad S. Tucker, Kathryn Jablokow and Bart Pursel. It is scheduled at 2:00pm on Tuesday, August 8.

We extend special appreciation to our technical session Review Coordinators: Janet Allen, Zhenghui Sha, Beshoy Morkos, Zahed Siddique, Anne Lucietto, Daniela Fass and Zahra Shahbazi. We also give our sincerest thanks to all the reviewers of technical papers; they have insured the quality of this year's conference.

The DEC technical committee meeting will be held on Tuesday, August 8, at 4:00pm, where we present many of the DEC Awards and plan for next year's conference. Everyone is welcome to attend. Our meeting is streamlined to respect members' participation on other committees.

We welcome you to ASME's 14th International Conference on Design Education, which has been designed for you to have a successful and useful conference in Cleveland.

Chair

Zahra Shahbazi

Manhattan College

Program Chair

Daniela Faas

Olin College of Engineering

22ND DESIGN FOR MANUFACTURING AND THE LIFE CYCLE CONFERENCE (DFMLC)

The Design for Manufacturing and the Life Cycle Committee in the Design Engineering Division of the American Society of Mechanical Engineers welcomes IDETC participants to the 22nd Annual Design for Manufacturing and the Life Cycle (DFMLC) Conference. The ASME Design for Manufacturing and the Life Cycle Conference is the main international forum for the exchange of technical and scientific information on the theory and practice of Integrated Product and Process Development, Sustainable Design and Manufacturing, Product Lifecycle Management (PLM), and Design for X (DFX) Methods. This conference provides a forum for researchers, practitioners, and educators from academia, government organizations and industry to share their latest results and challenges with the research community.

We are happy to report that this conference continues to feature many new and exciting results and methods to be presented as part of the conference technical sessions. This year's DFMLC conference includes 49 technical papers in 11 sessions, as well as one workshop session, one special session, and one student poster competition session, as follows:

- Sustainable Design and Manufacturing (two sessions)
- Life Cycle Decision-Making (two sessions)
- Design for Manufacturing and Assembly (two sessions)
- Design for Sustainable Additive Manufacturing
- Emerging Design for X (Quality, Reliability, Cost, Maintainability)
- Conceptual Design and Manufacturing Analysis
- Design of Sustainable Energy Systems
- Engineering for Global Development
- NSF Workshop
- Special Session: Lightning Talks on the Sustainable Design Frontier
- Student Poster Competition: Data-Driven X for the Life Cycle

We would like to thank all the authors for submitting papers, the paper reviewers for sharing their time and expertise, and the session chairs/co-chairs for their participation. Special thanks go to the DFMLC Special Session Chair, William Bernstein, and the paper review coordinators/co-coordinators for managing the papers through the review process:

Ryo Amano, Sara Behdad, William Bernstein, Jesse Austin-Breneman, Jun-Ki Choi, Marcos Esterman, Romain Farel, Wentao Fu, Ashwani Gupta, Karl Haapala, Gul Kremer, Amin Mirkouei, Yayue Pan, Qingjin Peng, Devarajan Ramanujan, Jeremy Rickli, Cassandra Telenko, Deborah Thurston, Qing Wang, Fu Zhao, Yaoyao Fiona Zhao, and Hao Zheng. Your participation and hard work have made DFMLC a successful conference!

This year, we will have a keynote presentation by Dr. David K. Harrison, Professor of Design and Manufacturing in Glasgow Caledonian University, U.K. who will speak on "Sustaining Small Scale Research over the Long Term." He will discuss the changing societal priorities and the typical supporting infrastructure that seeks to influence and support new research work.

We have a special session on "Lightning Talks on the Sustainable Design Frontier" on Monday afternoon. On Wednesday morning, two DFMLC sessions will feature an NSF workshop on proposal writing for senior Ph.D. students and early career researchers. We also have a Student Poster Competition on "Data-Driven X for the Life Cycle" on Tuesday morning.

On Tuesday afternoon, the Kos Ishii-Toshiba and best paper awards will be presented during the DFMLC technical committee meeting. We invite the IDETC community to attend the awards ceremony to congratulate the award recipients and to participate in the technical committee meeting.

On behalf of the entire DFMLC community, we welcome you to the 22nd Design for Manufacturing and the Life Cycle Conference in Cleveland, OH!

Chair

Qing Wang

Durham University

Program Chair

Sara Behdad

University at Buffalo

29TH INTERNATIONAL CONFERENCE ON DESIGN THEORY AND METHODOLOGY (DTM)

On behalf of the ASME Design Theory and Methodology Committee, we would like to welcome you to the 29th International Conference on Design Theory and Methodology (DTM). Our conference focuses on fundamental design theory and methodologies, and to apply them in an engineering context, with contributions provided by both researchers and practitioners. This 2017 DTM conference includes 46 technical papers and 8 technical presentations presented in 12 sessions across eight topics areas below:

- DTM-1 Creativity Ideation
- DTM-3 User Preferences
- DTM-5 Human Behavior in Design
- DTM-6 Sustainability in Design - (Design and Energy)
- DTM-10 Prototyping and Design Representation
- DTM-11 Design of Complex Systems
- DTM-12 Entrepreneurship and teams in design
- DTM-14 New and Emerging Trends in Design Theory

We would like to thank the authors for submitting their research to the conference. There were 74 full length technical papers submitted to the DTM Conference for peer review, of which 46 were selected for publication in the conference proceedings. The paper review process is essential to the success of the conference, and this year we are indebted to an excellent group of reviewers for committing their time and considerable expertise. As always, this peer review process was successfully managed by several DTM Review Coordinators: Alice Agogino, Saeema Ahmed-Kristensen, James Allison, Marco Aurisicchio, Jesse Austin-Breneman, Jon Cagan, Amaresh Chakrabarti, Claudia Eckert, Scott Ferguson, Katherine Fu, Dan Jensen, Barry Kudrowitz, Julie Linsey, Erin MacDonald, Scarlett Miller, Jitesh Panchal, Li Shu, Deborah Thurston, Christine Toh, Douglas Van Bossuyt, Noe Vargas Hernandez, Vimal Viswanathan, and Kristin Wood. We sincerely appreciate the time and effort these individuals contributed to maintaining the high quality of this DTM conference.

This year, five papers were nominated for the DTM Best Paper Award:

- IDETC2017-67261: Divergent Thinking Ability + Interest = Creative Ideas: Exploring the Relationships between Cognitive Creativity Assessments and Product Design Idea Generation by Jieun Kwon, Luke Bromback, and Barry Kudrowitz.
- IDETC2017-67369: Product Performance Evolution Prediction by Lotka-Volterra Equations by Guanglu Zhang, Daniel A. McAdams, Milad Mohammadi Darani, and Venkatesh Shankar.
- IDETC2017-67513: Object Reorientation and Creative Performance by A. M. Olteţeanu and L. H. Shu.
- IDETC2017-68127: The Design of the Crowd: Organizing Mass Collaboration Efforts by Zachary Ball and Kemper Lewis.
- IDETC2017-68366: Design Preference Prediction with Data Privacy Safeguards: A Preliminary Study by Alexander Burnap and Panos Papalambros.

Each one of these papers is of the highest quality, but the committee selected IDETC2017-67369 Product Performance Evolution Prediction by Lotka-Volterra Equations by Guanglu Zhang, Daniel A. McAdams, Milad Mohammadi Darani, and Venkatesh Shankar as the DTM Best Paper. The Best Paper will be presented on Tuesday afternoon at 4pm in DTM 11-1: Design of Complex Systems.

On Wednesday at 1:15pm, there will be a new type of session featuring technical presentations, or short “lightning talks”, about visions for future research in design theory and methodology. These technical presentations will not appear in the proceedings, so the only opportunity to learn about them will be during this session. Finally, we invite you to participate in the DTM Technical Committee Meeting on Tuesday evening. This year, the ASME Design Theory and Methodology Award will be presented to Dr. Alice Agogino.

We welcome you to Cleveland, Ohio and the 29th International Conference on Design Theory and Methodology!

Chair
Greg Mocko
Clemson University

Program Chair
Maria Yang
MIT

13TH ASME/IEEE INTERNATIONAL CONFERENCE ON MECHATRONIC & EMBEDDED SYSTEMS & APPLICATIONS (MESA)

The 2017 ASME/IEEE International Conference on Mechatronic and Embedded Systems and Applications (MESA 2017) is sponsored by ASME Division of Design Engineering and IEEE Intelligent Transportation Systems Society. On behalf of the Organizing Committee, we would like to extend to you our warmest welcome to the MESA 2017.

MESA was the first and so far the only conference that aims to bring mechatronic and embedded system designs and applications together. MESA provides a unique opportunity for professionals and students from different fields to meet and exchange ideas and experiences on research and development in mechatronic and embedded systems. MESA also represents a fruitful collaboration model between ASME and IEEE. Currently, MESA is organized by ASME and IEEE alternatively each year. Last year edition in August 2016, MESA was held in Auckland, New Zealand, organized mainly by IEEE.

This year we received 90 initial paper submissions. A majority of the submitted papers were reviewed by three reviewers. Only papers with at least two positive reviews were accepted. Through a rigorous review process by the Program Committee finally 65 papers are included in the conference program for presentations in 19 technical sessions. In addition, there is one excellent keynote speech.

The success of MESA 2017 would be impossible without the tireless effort and dedicated work of the Members of the Organizing Committees. In particular, we would like to express our sincere thanks to Symposium Chairs for their wisdom and hard work in coordinating the review of all submitted papers. We are grateful for Members of the International Program Committee and reviewers for their thorough review of the papers.

We would like to thank the Members of the Awards Committee for selecting papers for Best Paper Awards and Best Student Paper Awards. Our appreciation also goes to Members of the Advisory Committee for their guidance and to the keynote and plenary speakers who graciously agreed to share their vision of future challenges in mechatronic and embedded systems and applications. Above all, special thanks go to all the authors who have contributed their research works at the conference.

Finally, we sincerely hope you will enjoy the conference and have a great time in Cleveland and in Ohio.

Chair

Emanuele Frontoni

Marche Polytechnic University

Program Chair

Tapio Heikklla

VTT – Technical Research Centre of Finland Ltd.

41ST MECHANISMS AND ROBOTICS CONFERENCE (MR)

The Mechanisms and Robotics Technical Committee of the ASME Design Engineering Division welcomes you to the 41st Mechanisms and Robotics conference, the premier international forum for the exchange of technical and scientific information on the theory and application of mechanical systems, mechanisms, and robotics. Since 1952, the ASME Mechanisms and Robotics conference has provided an international forum for the exchange of technical and scientific information on the theory and practice of mechanical and robotic systems.

We have assembled an exciting conference program and slate of activities for the attendees, with more than 150 peer-reviewed technical papers organized into 8 technical symposia, a keynote speech, and the Student Mechanisms and Robotics Design Competition. Paper topics range throughout areas central to the design of mechanical, mechatronic, and robotic systems including kinematics, dynamics, design, analysis and validation, reconfigurable mechanisms, novel mechanisms and robots, software systems, educational practices, and various applications. This year, we launched two joint symposia: one on Micro/Nano-Scale Robotics & Manufacturing, and one on Motion Planning, Dynamics & Control that are jointly organized with the MNS and MSNDC conferences, respectively.

On Monday, our Keynote Address will be given by Dr. Roger D. Quinn, the Arthur P. Armington Professor of Engineering at Case Western Reserve University. Dr. Quinn has directed CWRU Biologically Inspired Robotics since its inception in 1990. His biology-engineering collaborative work on behavior-based distributed control, robot autonomy, human-machine interfacing, soft robots, and neural control systems have each earned awards.

Submitted papers were eligible for several awards, including the Mechanisms and Robotics Best Paper award, Freudenstein Young Investigator award, the A.T Yang Memorial award, and Compliant Mechanisms award. The authors of the best papers of the Mechanisms and Robotics Conference are invited to submit enhanced archival versions of their papers to an IDETC Special Issue of the Journal of Mechanisms and Robotics. We would like to thank Drew Murray, Chair of the Awards Committee, for coordinating the selection of the awards. Please attend our Tuesday award session for the presentation of these and the awards to the winners of the Student Mechanism and Robot Design Competition.

The conference and program chairs would like to extend special thanks to all the volunteers who participated in the peer-review process to produce this high-quality program, especially the symposium organizers who coordinated the process:

- MR-1 Mechanism Synthesis & Analysis: Dave Myszka, Feng Gao
- MR-2 Theoretical & Computational Kinematics: Guimin Chen, Leila Notash
- MR-3 Compliant Mechanisms: Charles Kim, Girish Krishnan
- MR-4 Origami-Based Engineering Design: Mary Frecker, Zhong You, James Joo
- MR/MNS-5 Micro/Nano-Scale Robotics & Manufacturing: Dave Cappelleri, Gloria Wiens
- MR/MSNDC-6 Motion Planning, Dynamics & Control: Hao Wang, Phil Voglewede
- MR-7 Medical & Rehabilitation Robots: Jason Moore, Ketao Zhang
- MR-8 Novel Mechanisms, Robots & Applications: Nina Robson, Amos Winter
- MR-9 Student Mechanisms and Robotics Design Competition: Brian Trease, Joshua Bishop-Moser

Special thanks is owed to all the authors, reviewers, presenters, symposium organizers, session-chairs and all the other volunteers who have contributed their efforts to the overall success of the conference. We hope that you enjoy the conference, and we look forward to your continued support and participation in future Mechanisms and Robotics Conferences.

Chair
Andreas Mueller
Johannes Kepler University Linz

Program Co-Chair
Jim Schmiedeler
University of Notre Dame

Program Co-Chair
Phil Voglewede
Marquette University

11TH INTERNATIONAL CONFERENCE ON MICRO- AND NANOSYSTEMS (MNS)

On behalf of the ASME technical committee on Micro and Nanosystems, we would like to welcome you to the 11th international conference on Micro and Nanosystems at Cleveland, Ohio. This special conference gathers experts from various parts of the world with a common interest on the mechanical aspects of Micro and Nano structures and devices. The conference features diverse and interdisciplinary topics ranging from materials and manufacturing, dynamic behavior, bio, energy, sensing, actuation, and AFM applications. In addition, it will feature a best paper award. The conference this year includes more than 62 papers and technical presentations, which are distributed through the three days of the conference according to the following symposia:

- MNS-2/Vib12/MNSDC9 Dynamics of MEMS and NEMS
- MNS-3 Bio MEMS/NEMS
- MNS-4 Micro/Nano Robotics and Manufacturing
- MNS-5 Functional Materials and Surface Engineering
- MNS-6 MEMS Sensors and Actuators
- MNS-7 Microscale Energy Harvesting
- MNS-8 Nonlinear Mechanics, Dynamics, and Control in Atomic Force Microscopy

In addition, we are delighted to announce that the conference will feature two distinguished keynote speakers: Prof. Arvind Raman from Purdue University, who will present a keynote talk entitled “Atomic Force Microscopy imaging and spectroscopy of soft matter and complex materials enabled by nanomechanics and microcantilever dynamics,” and Prof Christian A. Zorman from Case Western Reserve University, who will present a keynote talk entitled “Integration of Process-Incompatible Materials for Microfabricated Polymer-Based Neural Interfaces.” We are excited to have these world-leaders in the field and look forward for their excellent talks.

This conference would not have been made possible without the dedicated efforts of the symposia organizers. Thus, big words of thanks go to Drs. Jian Zhao, Brian Jensen, Gou-Jen Wang, Dumitru Caruntu, Ashis Banerjee, Irene Fassi, Gloria J. Wiens, Mircea Teodorescu, Yu Liu, Teresa Ryan, Jun Tang, Shahrzad Towfighian, Yong Shi, Hanna Cho, Jonathan Felts, David Cappelleri, Feng Shi, and Najib Kacem.

We are excited to have you in this conference and look forward for your valuable participation, engaging discussions, intriguing ideas, and fruitful experience. Once again, welcome to MNS2017 and welcome to Cleveland.

Chair

Mohammad Younis

Binghamton University

Co-Chair

Slava Krylov

Tel Aviv University

Program Chair

Longqiu Li

Harbin Institute of Technology

13TH INTERNATIONAL CONFERENCE ON MULTIBODY SYSTEMS, NONLINEAR DYNAMICS, AND CONTROL (MSNDC)

On behalf of the ASME Technical Committee on Multibody Systems and Nonlinear Dynamics (MSND), we extend a wholehearted welcome to the attendees of the 13th International Conference on Multibody Systems, Nonlinear Dynamics, and Control (MSNDC). Consisting of four keynote talks and 16 symposia, the conference features over 100 presentations covering traditional and emerging topics in the broad areas of multibody systems and nonlinear dynamics. This event presents a unique opportunity for dynamics researchers, practitioners, educators, and students to report on their accomplishments, exchange ideas, and become familiar with emerging trends in the field. Furthermore, we are organizing competitions for best paper and best student paper, and are providing student travel grants to qualifying undergraduate and graduate students.

Our first keynote talk this year represents the Lyapunov Award lecture, “From Understanding Nonlinear Phenomena to Exploiting Global Dynamics for Engineering Safety,” delivered by Professor Giuseppe Rega. Dr. Rega has been a Professor at Sapienza University of Rome until 2016. His field of expertise includes nonlinear oscillations of suspended cables, bifurcation and chaos of mechanical/structural systems from macro- to micro-scale, reduced order modelling, control of global dynamics, thermomechanical problems, smart materials. Former Editor-in-Chief of Meccanica and President of Italian Association of Theoretical and Applied Mechanics, he is Chairman of the EUROMECH Nonlinear Oscillations Conference Committee. Plenary Lecturer at about 20 International Conferences, has been honored with Special Issues of Nonlinear Dynamics and International Journal of Non-Linear Mechanics for his 60th and 70th birthdays.

A special session on “Autonomous and Connected Vehicles” will feature invited presentations by three experts in the field: Joshua Every from Transportation Research Center Inc., Eric Nutt from Mandli Communications Inc., and Carmine Senatore from Exponent Inc.

The first AVC keynote presentation, “Vehicle Automation – Beyond the PR,” will be delivered by Dr. Joshua Every. Josh received his PhD in Mechanical engineering from The Ohio State University, with research focused on vehicle testing and active safety system development. Upon graduation, he joined Transportation Research Center Inc. (TRC Inc.) as a research scientist contracted to NHTSA’s Vehicle Research and Test Center (VRTC) focusing on developing testing procedures to verify the safety of automated vehicles. Recently, Josh transitioned to TRC’s R&D division to become the Automated Vehicle and ADAS Lead, in conjunction with the construction of TRC’s SMART Center. His current work is focused on creating testing methods for vehicle automation systems, and developing procedures to ensure the safety of controlled environment testing and on-road deployments.

Our second AVC keynote lecturer, Mr. Eric Nutt, will discuss “The Challenges of an Effective Base Map for Autonomous Vehicles.” Eric Nutt is the Head of Technology for Mandli Communications, Inc., a high-tech solutions company developing large-scale data collection and processing systems that support our State DOTs in their mission to reduce traffic deaths to zero by converting vast information into actionable intelligence. Before taking on the challenges of strategic planning at Mandli Communications, Eric oversaw the research and development of data collection vehicles and data processing software, leveraging his Electrical Engineering and Computer Science degrees from UW-Madison to establish Mandli Communications, Inc. as the leader of large-scale network data collection and delivery projects across the country.

The third AVC keynote presentation, “Automated vehicles: current landscape and future directions,” will be delivered by Dr. Carmine Senatore. Carmine is a Senior Associate at Exponent, Inc. specializing in advanced driver assistance systems, vehicle-to-vehicle communications, automated vehicle technologies, and on-road and off-road vehicle dynamics. Since joining Exponent, he has designed and conducted experiments to investigate sensor fusion strategies for V2V safety applications and the use of automotive advanced sensors for the purpose of accident investigations. Dr. Senatore obtained his Ph.D. in Engineering Mechanics at Virginia Polytechnic Institute and State University. Prior to joining Exponent, Dr. Senatore was a research scientist at MIT, where he collaborated with national agencies, research institutions, and private companies to study how vehicles and robotic systems interact with unstructured environments.

Last but not least, we like to acknowledge the efforts and contribution of the symposium organizers as well as manuscripts reviewers whose effort is highly appreciated. We would like to also thank the paper/presentation contributors for choosing this conference as the venue for sharing the outcomes of their intellectual pursuits.

We look forward to a successful conference and hope that you will remember this Cleveland meeting as a memorable event.

Chair

Sachin Goyal

University of California, Merced

Co-Chair

Radu Serban

University of Wisconsin-Madison

Co-Chair

Zdravko Terze

University of Zagreb

Co-Chair

Jerzy Warminski

Lublin University of Technology

2017 ASME INTERNATIONAL POWER TRANSMISSION AND GEARING CONFERENCE (PTG)

We'd like to welcome you to the ASME 2017 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference.

The Power Transmission and Gearing field continues to grow and this year's conference draws attendance from leading industry professionals and academic scholars. It is my honor to grow with you as we continue to gather at forums like this that inspire, motivate, and ensure we remain at the cutting edge.

This year, we are delighted to welcome two keynote speakers:

Karsten Stahl, Technical University of Munich

Avinash Singh, Global Propulsion Systems General Motors

At the conference, you'll have the opportunity to meet and network with leading colleagues from around the world. We hope this will lead to sharing of technical knowledge and collaboration on both domestic and international platforms.

Before I close, I'd like to thank you for attending the conference and bringing your expertise to the table. As leaders, you build the vision and prompt the brilliant minds in your fields to continue pursuing the knowledge necessary for evolvement and advancement. This continual pursuit of excellence invokes an impact that endures. We are able to do what we do because of your commitment, and my respect and gratitude goes out to you.

Chair

Teik C. Lim

The University of Texas at Arlington

Program Chair

Qi Fan

The Gleason Works

29TH CONFERENCE ON MECHANICAL VIBRATION AND NOISE (VIB)

Welcome to the 29th ASME Conference on Mechanical Vibration and Noise (VIB)! The VIB Conference is sponsored by the Technical Committee on Vibration and Sound and is supported by the Technical Committee on Multibody Systems and Nonlinear Dynamics, both under ASME's Design Engineering Division. The VIB Conference began in 1967 and was originally held in odd-numbered years. The conference is now held annually as part of the ASME International Design Engineering Technical Conferences.

The VIB Conference theme is deliberately broad, covering all aspects of vibratory systems. You will discover a diverse mixture of papers from the forefront of emerging fields, from traditional and nontraditional academic research, and from industrial applications. The quality and breadth of papers in this conference series makes it one of the most technically interesting conferences held by ASME, and one of the best to meet colleagues from around the world.

The conference is highlighted by keynote lectures from two eminent researchers:

- Professor I.Y. Steve Shen (University of Washington), recipient of the Myklestad Award for major innovative contribution to vibration engineering.
- Professor Kon-Well Wang (University of Michigan), recipient of the Den Hartog Award for lifetime contributions to the teaching and practice of vibration engineering.

Papers were solicited in symposia covering a range of important vibration and noise topics. The symposia and their organizers are:

- Structures and Continuous Systems
  - Dumitru Caruntu, Weidong Zhu, and Marco Amabili
- Vibration Control, Energy Harvesting, and Smart Structures
  - Ryan Harne, Lei Zuo, and Alper Erturk
- Nonlinear Systems and Phenomena
  - Stefano Lenci, Jose Balthazar, Paulo Goncalves, and Farbod Alijani
- Vibration and Stability of Mechanical Systems
  - Christopher Cooley and Robert Parker
- Jointed Structures, Contact, Friction, and Damping
  - Matthew Brake, Aldo Ferri, Matthew Allen, and Adam Brink
- Rotating Systems and Rotor Dynamics
  - C. Nataraj, Regis Dufour, Paolo Pennacchi, and Kshitij Gupta
- System Identification, Damage Detection and Diagnostics
  - Weidong Zhu and Yongfeng Xu
- Industrial Applications of Dynamics, Vibration, and Acoustics
  - Brian Olson, Matthew Brake, Bruce Geist, Ron Couch, and Matt Lear
- Emerging Systems and Applications
  - Dane Quinn, Stephanos Theodossiades, and Venkat Ramakrishnan
- Dynamics of MEMS and NEMS
  - Mohammad Younis, Slava Krylov, Najib Kacem, and Jian Zhao
- Dynamics and Control of Biomechanical Systems
  - Dumitru Caruntu, Bogdan Epureanu, and Davide Piovesan
- Dynamics of Mechanical and Acoustic Metamaterials
  - Ryan Harne, Chengzhi Shi, and Massimo Ruzzene
- Time-Varying and Time-Delay Systems
  - Matthew Allen, Robert Parker, and Matthew Brake

We encourage you to become more involved with the conference through attending the Technical Committee on Vibration and Sound's annual fall meeting, on Tuesday night of the conference.

Chair

Dumitru Caruntu

University of Texas Rio Grande Valley

Program Chair

Matthew Brake

Rice University

10TH FRONTIERS IN BIOMEDICAL DEVICES (BIOMED)

Welcome to the 10th Frontiers in Medical Devices (BIOMED) Conference. The BIOMED Conference is intended to provide a cutting-edge forum for enhancing the development of next generation of biomedical devices by sharing the recent innovations in analytical, computational, and experimental techniques within the bioengineering and design community.

We have an exciting conference program for the attendees, with technical presentations organized into 4 sessions. The topics of BIOMED 2017 are focused on wearable and implantable Technologies, as well as biorobotics and haptics.

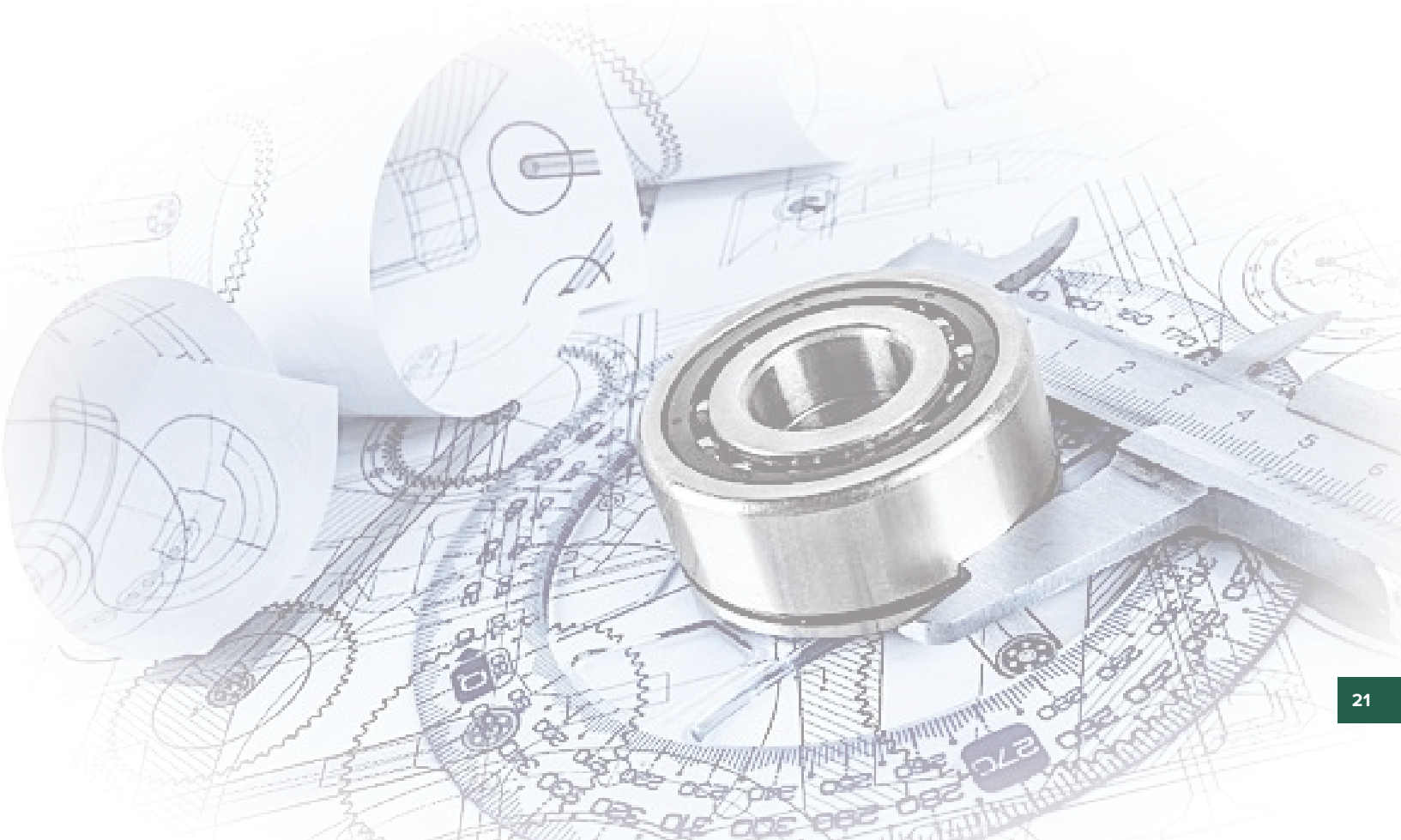
I would like to thank all authors, session chairs, symposium chairs and reviewers who have contributed their efforts to the overall success of BIOMED conference. Special thanks to IDETC conference chairs Dumitru Caruntu and Bogdan Eprueanu, technical program chair Stefano Lenci and ASME staffs, whom without their support this event would not have been possible.

I hope that you enjoy the conference and look forward to your continued support in the future.

Chair

Ehsan T. Esfahani

University at Buffalo



AVT KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 24

Xin Guan

Jilin University

"Cyber Proving Ground for Intelligent Vehicle on Driving Simulator"

Abstract: I Intelligent vehicles present a new research and development frontier in the automotive industry given the likelihood an intelligent vehicle will become available in the near future. The validation, verification, and calibration of intelligent vehicles are costly, time-consuming, and risky when carried out with an actual car in real environments. Consequently, using a driving simulator as the cyber-proving-ground offers a better way to validate, verify, and calibrate intelligent vehicles. This presentation will describe the means of using a driving simulator for intelligent vehicles being developed at Jilin University, and addresses the challenges of cyber proving ground on simulating the complexities of the stochastic driver and vehicle traffic within the traffic environment. In addition, this presentation explores the theory and test methodology of how drivers receive cues for following, safety, efficiency, and lawful driving style. It also discusses how a statistical database for driving styles of Chinese drivers is established (using a large number of experiments) with consideration of drivers' operation time-history signal and physiological and psychological states. In addition, it describes the modeling of the complex traffic environments and the dynamic simulation methods. This presentation also includes a discussion of how the stochastic driver-model was established using the statistical characteristics of driving behaviors to represent the group of drivers. With this model, the behavior of realistic anthropomorphic vehicle traffic was accurately simulated. Research on the virtual sensors is also presented along with a quick-culling model to simulate the camera and radar and to obtain objects from the cyber-proving-ground. Finally, an intelligent vehicle controller was integrated with the cyber-proving-ground driving simulator and successfully calibrated. The method offers considerable savings of money and time and avoids the numerous trials and safety risks associated with field testing.

Biography: Professor Guan currently serves in several key positions in the Chinese automotive sector, including the Vice-President of the Society of Automotive Engineers of China, the editorial board of the International Journal of Vehicle Performance, the Director of the Automotive Dynamics Branch of the National Automobile Standardization Committee, the Jilin Provincial Government Counselor, and the leading expert of the overall group of 863 major projects of the Chinese Ministry of Science and Technology. Prof. Guan served as Dean of the College of Automotive Engineering of Jilin University from 2004 to 2012, and the Director of the State Key Laboratory of Automotive Simulation and Control from 1996 to 2015. He has received three first-prize awards for provincial scientific and technological achievements. In addition, he received the Golden Bull Award of National Key Laboratory Program provided by the Ministry of Science and Technology in 2008, the China Automobile Industry Youth Science and Technology Award in 1998, and the China Science and Technology Outstanding Achievement Award from GM in 1996.

The specific academic contributions of Dr. Xin Guan include:

- Established, in 1993, the State Key Laboratory of Automotive Simulation and Control at Jilin University and successfully developed the first vehicle driving simulator with an investment of more than 25 million Chinese Yuan. The simulator was designated as one of the top in Asia, and has been successfully applied to the development of more than 10 independent vehicles in China.
- Created a unique vehicle dynamics with stick-slip friction model, wheel carcass dynamics, and dynamic steering system model. The model successfully solves shortcomings with the classic model, which is not accurate when simulating high-speed steering, shimmy, and other transient processes.
- Investigated a universal driver model that integrated controls of the longitudinal and lateral motion of vehicles, which can be used for various driving simulations of intelligent vehicles. The model gives a unique innovation scheme that complies with level 3+ intelligent vehicles.

AVT KEYNOTE – MILLIKEN AWARD LECTURE

Tuesday, August 8
9:10am–10:50am
Room 24

Martin Jones

Moog Industrial Group

"Tracing the Origins of the Automated 'Fly-By-Wire' Technology Used in Contemporary Formula 1 Cars"

Abstract: The lecture starts with a review of the early work done on vehicle stability done at CAL in the 1950's by Bill Milliken and his colleagues made possible by then recent developments in hydraulic technology. It moves on to describe the subsequent development of active suspension and associated systems by Lotus Engineering and Team Lotus in the early 1980's and the widespread adoption of this technology by Williams GP and the other F1 teams around 1990. At this point there is a brief analysis of why hydraulic technology has been used almost universally in these applications despite dramatic developments in electric motor performance. After a review of the automated systems or 'driver aids' used on the current crop of Formula 1 and WEC cars, the lecture concludes with a description of other applications of F1 miniature hydraulics, Namely: Autonomous Robots, America's cup yachts and Oil & gas exploration.

Biography: Martin Jones works as Motorsport Market Manager for the Moog Industrial Group in the UK-where he is responsible for the development & technical support of Moog's global motor racing business. He studied Physics and Economics at the University of East Anglia and subsequently Control Engineering at Bath University. In a career of over 35 years at Moog he has been instrumental in the design and development of many automated actuation systems including:

- Wave compensated hoisting systems for offshore cranes.
- Active suspension and satellite guidance systems for agricultural vehicles.

- Servo-controlled levelling of large man-lifts (Access platforms).
- Closed-loop Frequency and Power regulation of multi-phase water turbines.
- High speed gauge control systems for aluminum rolling.
- Numerous servo-actuations systems for F1 –and the development of unconventional technology for power steering and fly by wire braking.

Martin's interest in Motorsport extends beyond work and he is also a keen competitor in Historic Motorsport events in his Brabham BT21.

CIE KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 1

Gahl Berkooz

Acorns

"Data, Analytics, and Internet of Things: The Perfect Storm and Some Grand Challenges"

Abstract: "Data and Analytics" is a unique engineering business practice. Unlike mechanical, aerospace, or electrical engineering the state of practice in industry is ahead of the theoretical foundations provided by academic research. This state of affairs is dictated by the tremendous business opportunities afforded by the underlying technologies. I will discuss the state of the art in Data and Analytics practice, and elucidate some of its drivers and complexity factors. I will close by describing some "Grand Challenges" – engineering problems that practitioners in industry are attempting to solve, yet lack a rigorous framework to support their solution.

Biography: Gahl Berkooz is the Chief Data and Analytics Officer for Acorns, whose mission is to make Americans financially empowered by financial literacy, saving, and investing. Prior to Acorns, he was Chief of Analytics for General Motors' Global Connected Customer Experience Division. At GM he was responsible for all Analytical Data Sets, Analytics, and Data Science required to delight customers with the best customer experience in the industry. Prior, he established the Information Management and Analytics function at Ford Motor Company. He built the function to over 100 professionals, and delivered close to $2 Billion of savings and cost avoidance in business operations. He holds a Ph.D. in Applied Mathematics from Cornell University, a Six Sigma Black Belt, and is a graduate of Harvard Business School's General Management Program.

DAC KEYNOTE

Monday, August 7
9:10am–10:50am
Room 1

"Data-Driven Engineering Design"

Abstract: Data has always been an integral part of the engineering design process. We use this basic and unfiltered information to create knowledge, which in turn informs our engineering design decisions. Yet, the miniaturization of electronics, the Internet of Things, and social media provides engineers with access to a plethora of data in forms, volumes, and acquisition rates not previously encountered. To most effectively make use of this data, the design engineering research community must understand how to most effectively transition this data into actionable design knowledge. This keynote session will include a panel of distinguished speakers who will address a wide variety of opportunities that include the acquisition and analysis of unstructured data from various sources, handling large volumes of data that must be searched and understood, and synthesizing data in a way that leads to better engineered products. Speakers discussing the frontier of Data-Driven Engineering Design will include Kemper Lewis (University at Buffalo), Eleanor Feit (Drexel), Ritesh Khire (84.51°), and a set of lightning talks by early-career members of the Design Automation Conference.

INVITED SPEAKERS

Elea McDonnell Feit

Drexel University

Biography: Elea McDonnell Feit is an Assistant Professor of Marketing at Drexel University and a Senior Fellow of Marketing at The Wharton School at the University of Pennsylvania. Her research focuses on leveraging customer data to make better product design and advertising decisions, particularly when data is incomplete, unmatched or aggregated. Much of her career has focused on developing new quantitative methods and bringing them into practice, first working in product design at General Motors, then commercializing new methods at the marketing analytics firm, The Modellers, and most recently as the Executive Director of the Wharton Customer Analytics Initiative, where she built the academic-industry partnership program. She brings a rich understanding of industry problems to her research, which has been published in Management Science and the Journal of Marketing Research. She enjoys making analytics and statistics accessible to a broad audience and has recently co-authored a book on R for Marketing Research and Analytics with Chris Chapman. She regularly teaches popular tutorials and workshops for practitioners on digital marketing, marketing experiments, marketing analytics in R, discrete choice modeling and hierarchical Bayes methods as well as undergraduate, MBA and MS Business Analytics classes at Drexel and Wharton. She holds a PhD in Marketing from the University of Michigan, an MS in Industrial Engineering from Lehigh University and a BA in Mathematics from the University of Pennsylvania.

Keynote Sessions

IDETC/CIE

Kemper Lewis

University at Buffalo

Biography: Kemper Lewis is Professor and Chair of the Department of Mechanical and Aerospace Engineering and also holds an appointment as Professor in the Department of Management Science and Systems at the University at Buffalo (UB). In addition, he serves as the Director of the Sustainable Manufacturing and Advanced Robotic Technologies (SMART) Community of Excellence and as a Site Director of the National Center for e-Design at UB. His research focuses on foundational issues in decision making in engineering design and his contributions have spanned complex decision networks, tradeoff models, adaptive systems, and design analytics. He has published over 200 articles in journals, conference proceedings, and books and is a fellow of the American Society of Mechanical Engineers. In recognition of his scholarship in design research and education, he has received awards from ASME, SAE, ASEE, AIAA, NSF, NASA, and the State of New York.

Ritesh Khire

84.51° LLC

Biography: Ritesh is a Senior Research Scientist and leader of the optimization group within the Science department of 84.51° LLC (a customer science organization within Kroger). His primary research includes developing efficient methodologies for large-scale data-driven optimization problems. The majority of these problems involve 108 to 1012 mixed-integer decision variables, where the underlying models are derived from one or more sophisticated Machine Learning techniques, such as regular & logistic regressions, random forest, neural networks, re-enforcement learning, dynamic linear models, recursive least square models, etc. The application areas include price and promotion optimization, customer personalization, trade fund optimization, inventory management, and many others. Many of these problems include both static and real time aspects of decision making. Ritesh has been exploring decomposition based optimization approaches that blend traditional (gradient based) optimization techniques with non-traditional techniques (e.g. Bayesian optimization, GA, PSO, etc.) to solve these large-scale problems. He is also interested in high-performance computing and GPU computing.

Ritesh obtained his PhD from Rensselaer Polytechnic Institute (RPI) in 2006 under the guidance of Prof. Achille Messac. In the past, Ritesh has been invited as special speaker for the 2010 NSF panel on future of MDO and for the 2008 ASME-IDETC panel on System integration tools. He is an active member of the DAC conference and has organized many special sessions over the last 10 years. Ritesh has published a collection of book chapters, journal & conference papers, and patents over the last decade. Prior to joining 84.51, Ritesh was a Staff Research Scientist at United Technologies Research Center for over 8 years, where his research primarily focused on optimization of engineering systems.

DEC KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 23

Sunand Bhattacharya

Autodesk, Inc.

"Radical Collaboration by Design in Engineering Education"

Abstract: The culture of innovation in the classroom has been spreading rapidly across all levels of education and challenging the boundaries of classical design and engineering studies. The greatest potential for companies like Autodesk to serve design-related-education exists at the intersection of three convergences:

- Designing, Making, and Using
- Infinite Computing, Digital Manufacturing, and The Internet of Things
- Creating Places, Things, and Media

The future of making and learning things exists at the nexus of these three convergences. We need radical collaboration if we are to truly address the nexus of design, make, use; infinite computing, digital manufacturing, and internet of things; and places, things, and media. Successful integration of this curricular effort into disciplines of engineering and design is important for bridging the gap between education and industry expectations.

Is design-related-education embracing these trend, technologies and new workflows to holistically address next generation's desire to innovate?

Biography: As part of the Autodesk Education Experience Group, Sunand Bhattacharya manages its Learning Futures team. In this role, he is responsible for the strategy, management and evangelization of Autodesk's future influence advocacy in global academia.

Prior to Autodesk, Sunand was the principal and co-founding partner of Arjuna Learning Designs LLC., a firm specializing in the creation of interactive learning objects to enhance quality of teaching and learning for name brand publishing houses. He is also a tenured professor of industrial design, and has held executive positions at, Southern Illinois University at Carbondale. Sunand is a recipient of the Innovative Excellence in Teaching, Learning, and Technology award from The International Conference on College Teaching and Learning.

Sunand is a graduate in Industrial Design from the National Institute of Design (NID) in India and holds his terminal graduate degree in Industrial Design and Human Factors from The Ohio State University.

DEC KEYNOTE

Tuesday, August 8
9:10am–10:50am
Room 23

Karen E. Crosby

Southern University Baton Rouge, Louisiana

"Overview of Undergraduate Stem Education Research and Related NSF Funding Opportunities"

Abstract: This session will present various funding opportunities to support STEM education projects offered through the Division of Undergraduate Education (DUE) at the National Science Foundation (NSF). An NSF/DUE Program Director will share details about current programs such as Advanced Technological Education (ATE), Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM), Improving Undergraduate STEM Education (IUSE), and other select NSF funding opportunities that support engineering education. Time permitting, the session will culminate with helpful hints and fatal flaws to consider when developing proposals.

Biography: Dr. Karen E. Crosby is a Professor of Mechanical Engineering at Southern University Baton Rouge, Louisiana, currently on assignment as a Program Director in the Division of Undergraduate Education at the National Science Foundation. Dr. Crosby's technical expertise is in materials science and engineering. Additionally, Karen is dedicated to Science, Technology, Science, and Mathematics (STEM) education research, especially enhancing student motivation, retention, and learning in engineering through innovative teaching methods and integrating research experiences. Her latest projects involved STEM outreach and education, including enhancing and creating academic programs and facilitating global research opportunities in sustainability, specifically materials and technology for renewable energy applications and next-generation composites. Her years of work have garnered local awards for excellence in teaching and research and national recognition for educational leadership and mentoring. When she is not working, Karen enjoys spending time with family and friends experiencing good food, good music, and traveling.

DFMLC KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 22

David K Harrsion

Glasgow Caledonian University

"Sustaining "Small Scale" Research Over the Long Term"

Abstract: In the proposed presentation the Author will attempt to illustrate the relationship between Design, Manufacture and monitoring towards the end of life recycling of manufactured products based on research work that he has directed over recent years.

The Author will also set the foregoing in the context of the changing societal priorities and will explain the typical supporting infrastructure that seeks to influence and support new research work.

Attention will not only be given to direct government support, often indirect through agencies, but also to the assistance offered by Professional Bodies, Charities, and also the opportunities afforded by mutually beneficial international collaboration

Biography: David is currently Professor of Design & Manufacturing at Glasgow Caledonian University where he has held a range of managerial roles. He has spent his working career in the manufacturing industry or industry-facing academia. A graduate of UMIST, he is the joint author of the textbook "Systems for Planning & Control in Manufacturing". He has also edited several books and conference proceedings and has published his work widely. He has supervised 64 PhD students through to graduation, most of whom have been embedded in manufacturing companies. Around half of these students have been based outside the United Kingdom.
He is a Visiting Professor of the University of Mining & Metallurgy, Krakow in Poland. He is an experienced external examiner at Undergraduate, Masters and Doctoral levels and has examined in China, Australia, India, Africa, Poland and Germany, as well as throughout the United Kingdom.

David is an Ex Deacon of the Incorporation of Hammermen of Glasgow, which received its "Grant of Arms" in 1536 and thereby may claim to be one of the World's older "Engineering Societies". David is also a Past President of the Institution of Engineers & Shipbuilders in Scotland. Currently, David is the Secretary of the United Kingdom Engineering Professors' Council representing the combined interests of all of the University Engineering Departments to Government, Professional Bodies and other Stakeholders. He is also a Trustee of the Trades House of Glasgow, a Director of Glasgow Chamber of Commerce and a Director of Glasgow Merchants House. He additionally holds office in four Glasgow-based Charities.

Keynote Sessions

IDETC/CIE

MESA KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 19

James H. Christensen

Holobloc Inc.

"Evolution of Embedded Platforms for Cyber-Physical Systems"

Abstract: Today's definition of Cyber-Physical Systems (CPS) as "engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components" has evolved from Wiener's 1948 definition of cybernetics as the scientific study of "control and communication in the animal and the machine." Along this evolutionary path we have seen developments such as the concept of Holonic Manufacturing Systems3 (HMS) in the 1990s, and the release in the early 200s of the multi-part IEC 61499 Standard for the development and deployment of reusable software modules (function blocks) in distributed, intelligent automation and control systems.

In recent years, the capabilities of embedded hardware and software platforms have evolved sufficiently to present the possibility of cost-effective embedding of CPS functionality to meet the requirements anticipated by HMS and now expressed in domains such as Industrie 4.07, the Smart Grid8 and Open Process Automation9. In this talk we will explore the emergence of standardized, open-sourced embedded hardware, software and development environments to make that possibility a reality.

Biography: James H. Christensen received the Ph.D. degree in chemical engineering and computer science from the University of Wisconsin at Madison in 1967. He is currently with Holobloc Inc., Cleveland Heights, OH, USA. He is an internationally recognized expert in the standardization and application of advanced software technologies to the automation and control of manufacturing processes. Dr. Christensen received the Rockwell International Engineer of the Year and Lynde Bradley Innovation Awards in 1991 for his achievements in pioneering applications of object-oriented programming in Smalltalk, and in 2007, he received the IEC 1906 Award and Process Automation Hall of Fame membership for recognition of his accomplishments in the international standardization of programming languages and architectures for industrial automation.

MR KEYNOTE

Monday, August 7
8:00am–9:00am
Room 9

Larry L. Howell

Brigham Young University

"From Micromachines and Surgical Instruments to Spacecraft: How Origami-Based Engineering Can Impact Our World"

Abstract: For centuries origami artists have invested immeasurable effort developing origami models under extreme self-imposed constraints (e.g. only paper, no cutting or gluing, one regular-shaped sheet). The accessible and formable medium of paper has enabled swift prototyping of vast numbers of possible designs. This has resulted in stunning origami structures and mechanisms that were created in a simple medium and using a single fabrication process (folding). The origami artists' methods and perspectives have created systems that have not previously been conceived using traditional engineering methods. Using origami-inspired methods, it may be possible to design origami-like systems, but using different materials and processes to meet emerging product requirements. This presentation will highlight research in origami-based engineering at Brigham Young University, and will include a diverse set of applications.

Biography: Larry L Howell is an Associate Dean and Professor at Brigham Young University (BYU). Prof. Howell received his B.S. degree from BYU and M.S. and Ph.D. degrees from Purdue University. Prior to joining BYU in 1994 he was a visiting professor at Purdue University, a finite element analysis consultant for Engineering Methods, Inc., and an engineer on the design of the YF-22 (the prototype for the U.S. Air Force F-22 Raptor). He is a Fellow of ASME, past chair of the ASME Mechanisms & Robotics Committee, and has been associate editor for the Journal of Mechanisms & Robotics and the Journal of Mechanical Design. He is the recipient of the ASME Machine Design Award, ASME Mechanisms & Robotics Award, Theodore von Kármán Fellowship, NSF Career Award, Purdue Outstanding Mechanical Engineer (alumni award), and the BYU Karl G. Maeser Distinguished Lecturer Award (BYU's highest faculty award). Prof. Howell's research focuses on compliant mechanisms, including origami-inspired mechanisms, space mechanisms, microelectromechanical systems, and medical devices. He is the co-editor of the Handbook of Compliant Mechanisms and the author of Compliant Mechanisms published by John Wiley & Sons. His lab's work has also been reported in popular venues such as Newsweek, Scientific American, Popular Science, and the PBS documentary program NOVA.

MR KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 26 A

Roger D. Quinn

Case Western Reserve University

Animals as Models for Robot Mobility and Autonomy: Crawling, Walking, Running, Climbing and Flying – Case Western Reserve University Biologically Inspired Robotics

Abstract: The capabilities of current mobile robots pale in comparison to those of most animals. The goal of our research is to bridge this gap by studying animal systems and applying these designs and even their materials to robots to improve their mechanical designs, autonomous behaviors, locomotion, and energy efficiency. We are using multiple complementary approaches. In one approach the fundamental principles of insect locomotion are applied using existing technologies and in a simplified manner. Their motor control is also simplified and the agility of these vehicles makes them suitable for many applications such as amphibious operations and search and rescue. This abstracted approach has also been used to develop a small fixed-wing vehicle called MALV (micro air and land vehicle) that flies, lands and crawls. Using a more direct approach we are developing other robots including a moth-like robot with compliant, flapping wings that mimic those of the animal. We have also developed a number of robots with multi-segmented legs mirroring those of animals. For these robots, we are developing synthetic nervous systems for their control based upon animal neurobiology. We are also developing structurally soft worm-like robots, which crawl via peristaltic waves, for pipe inspection and, when made compact, within the body. Robots with a human in the loop for basic control decisions are limited in their movements in complex terrain because of sparse sensory data and limited communications. Some autonomy is essential for their agility. Insect neurobiology and behavioral experiments are being used to develop decision making strategies. Our autonomous Snowmower, benefits from a distributed control architecture similar to that found in animals and will eventually implement an animal-inspired brain. In still another approach, teaming with the Case bio-fabrication group we are developing small robots using organic materials.

Biography: Roger D. Quinn is an Arthur P. Armington Professor of Engineering at Case Western Reserve University. He joined the Mechanical and Aerospace Engineering department in 1986 after receiving a Ph.D. (1985) from Virginia Tech and M.S. (1983) and B.S. (1980) degrees from the University of Akron. He has directed CWRU Biologically Inspired Robotics since its inception in 1990. His research, in collaboration with biologists, is devoted to the development of robots and control strategies based upon biological principles. Dozens of robots have been developed to either improve robot performance with biological principles or model animal systems. He has authored more than 250 publications and 9 patents on practical devices resulting from his work. His biology-engineering collaborative work on behavior based distributed control, robot autonomy, human-machine interfacing, soft robots, and neural control systems have each earned awards.

MNS KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 13

Arvind Raman

Purdue University

"Atomic Force Microscopy Imaging and Spectroscopy of Soft Matter and Complex Materials Enabled by Nanomechanics and Microcantilever Dynamics"

Abstract: "To engineer the tools of scientific discovery" has been described as one of fourteen grand challenges for engineering by the US National Academy of Engineering. Since it's invention more than thirty years ago the Atomic Force Microscope has proven to be such a tool, continuing to have a transformational effect on materials engineering and nanoscience. It's ability to "mechanically" image features smaller than one nanometer on a vast variety of samples in liquids, gases, or in vacuum remains unmatched by the best optical or electron microscopes.

We discuss recent advances in two challenge areas for the atomic force microscope – one in the imaging and force spectroscopy on soft materials such as polymers and live cells, and the second in the sub-surface imaging of complex materials such as nano-composites. Both advances rely on significantly improved modeling of tip-sample nanomechanics and understanding its effect on microcantilever vibrations. In the former, new contact mechanics models that explicitly take into account local relaxation and surface forces are needed and their influence on microcantilever dynamics need to be interpreted. In the latter, computational models of electrostatic and stress interactions in the sub-surface need to be coupled to microcantilever observables to enable non-destructive sub-surface reconstruction in complex materials. Both computational and experimental results are presented.

Biography: Dr. Arvind Raman is the Robert V. Adams Professor of Mechanical Engineering at Purdue University. His research focuses on applications of nonlinear dynamics, vibrations, and fluid-structure interactions in nanotechnology/MEMS/NEMS, manufacturing, and biomechanics. He has mentored twenty-two PhD students, co-authored more than a hundred and thirty peer-reviewed journal articles, held visiting positions at the Universidad Autonoma de Madrid (Spain), University of Oxford (UK), and Technical University Darmstadt (Germany), and secured funding from the NSF, NIH, NASA, NNSA, and several national and international industrial sponsors. He is an ASME fellow, an ASME Gustus Larson Memorial Award recipient, Keeley fellow (Wadham College, University of Oxford), College of Engineering outstanding young investigator awardee, and a NSF CAREER awardee.

Professor Raman joined Purdue University in 2000 as an Assistant Professor following a PhD in Mechanical Engineering from the University of California at Berkeley advised by Prof. C. D Mote Jr. (1999), MS in Mechanical Engineering from Purdue University (1993), and a B. Tech in Mechanical Engineering from the Indian Institute of Technology, Delhi (1991). He was promoted to Associate Professor (2005), full Professor (2009) and named the Robert V. Adams Professor of Mechanical

Engineering at Purdue University (2013). Since May 2014, he is the inaugural Associate Dean for Global Engineering Programs, leading College strategic initiatives for global education, research, and engagement in Latin America, sub-saharan Africa, Middle East and North Africa, and East Asia.

MNS KEYNOTE

Tuesday, August 8
11:00am–12:00pm
Room 13

Christian A. Zorman

Case Western Reserve University

"Integration of Process-Incompatible Materials for Microfabricated Polymer-Based Neural Interfaces"

Abstract: The desire to utilize microelectromechanical systems (MEMS) technology in applications where silicon is not well-suited has necessitated the development of materials not commonly used in IC processing. This talk presents an overview of several collaborative research projects to develop MEMS-based devices for long-term neural interfacing. These projects include: (1) development of a microfabricated cortical probe from a chemoresponsive, mechanically-dynamic, nanocomposite polymer, and (2) development of a polymer-based thin film transfer technology for mechanically-flexible diamond-on-polymer microelectrodes. Both projects involved the use of materials that offered interesting opportunities and/or challenges with respect to their mechanical properties. A central, unifying theme among these projects is the fabrication of key structural device components using newly developed materials and/or the fabrication of devices using materials that are incompatible with respect to the way they are commonly processed.

Biography: Christian A. Zorman received a B.S. cum laude in physics and a B.A. cum laude in economics from the Ohio State University in 1988, followed by M.S. and Ph.D. in physics from Case Western Reserve University in 1991 and 1994, respectively. He joined the MEMS program at CWRU in 1994 as a Research Associate, was promoted to Senior Research Associate in 1997 and Researcher in 2000. From 2000 to 2002, he held an appointment as Adjunct Assistant Professor in the Department of Electrical Engineering and Computer Science. He joined the EECS faculty at CWRU in 2002 as an Associate Professor and currently holds an appointment as Professor with secondary appointments in the Departments of Biomedical Engineering and Mechanical and Aerospace Engineering. Dr. Zorman is also a Research Associate at the Louis Stokes Cleveland VA Medical Center where he serves as Co-Director of Research and Scientific Affairs for the Advanced Platform Technology Center of Excellence. He currently serves as Faculty Director of the Microfabrication Laboratory at CWRU.

Prof. Zorman has authored over 250 peer-reviewed technical publications, is a Senior Member of IEEE and chairman of the MEMS Technical Group in the American Vacuum Society. In 2009, Professor Zorman received the John S. Diekhoff Award for Excellence in Graduate Mentoring, CWRU's highest honor in this area. His research centers on the development of novel, enabling materials and the requisite processing techniques for micro- and nanoelectromechanical systems with an emphasis on applications in challenging environments.

MSNDC KEYNOTE – LYAPUNOV AWARD LECTURE

Tuesday, August 8
2:00pm–5:40pm
Room 26 A

**2nd half of this session includes the special session on Autonomous and Connected Vehicles (see page 40)*

Giuseppe Rega

Sapienza University of Rome

"From Understanding Nonlinear Phenomena to Exploiting Global Dynamics for Engineering Safety"

Abstract" Understanding nonlinear dynamics phenomena in solid/structural mechanics has required about forty years of intense theoretical and applied research efforts, which can be tentatively framed within some main stages of development. The first three of them encompass nonlinear oscillations addressed through analytical methods, bifurcations and complex dynamics investigated via geometrical and computational techniques, experimental testing of the nonlinear response of small-scale models aimed at cross-validating theoretical and numerical outcomes. The first part of the talk overviews some relevant representative achievements, by referring to the suspended cable as to a continuous/reduced-order archetypal model, or an experimental system, exhibiting a satisfactory variety of issues and phenomena typical of the nonlinear dynamics of smooth flexible systems with initial curvature.

The fourth stage of current development is characterized by a marked hybridization of nonlinear dynamics with other theoretical and application areas, which include control, consideration of also micro/nano, intelligent, or coupled systems, and multiphysics problems. The second part of the talk dwells on the role that nonlinear dynamics is expected to play in the near future to meaningfully affect the analysis, control and safe design of real engineering systems. Focus will be in particular on how to properly exploit concepts and tools of global dynamics for evaluating robustness and safety of the response in presence of unavoidable imperfections, as well as for controlling and possibly improving the system/structure load carrying capacity, independent of its specific mechanical and dynamical features, of its possible multi-dimensional character, and of the spatial scale of the relevant application.

Biography: Giuseppe Rega has been a Professor of Solid and Structural Mechanics at the Sapienza University of Rome from 1995 to 2016 and, formerly, at the University of L'Aquila, where he was the Head of the Department of Structure, Water and Soil Engineering. He taught to students in Civil and Mechanical Engineering, and Architecture, where he established an innovative Master degree on Structures. At Sapienza, he was Chairman of the Ph.D. Program in Structural Engineering, and Director of the Doctoral School in Civil Engineering and Architecture. Former

Chairman of the Italian Committee of Professors of Solid and Structural Mechanics, he was President of AIMETA (Italian Association of Theoretical and Applied Mechanics). Currently, he is Chairman of the EUROMECH Nonlinear Oscillations Conference Committee, Italian Representative at the IUTAM General Assembly, member of the Scientific Council of CISM (International Centre for Mechanical Sciences). He has served with major Archival Journals as E-i-C (Meccanica), current/past AE (Journal of Vibration and Control, Prikladnaya Matematika i Mekhanika/Chaos Solitons & Fractals, ASME Journal of Computational and Nonlinear Dynamics, Mathematical Problems in Engineering), and EB member (Nonlinear Dynamics, International Journal of Dynamics and Control). He has organized many International Conferences/Symposia in the broad area of nonlinear dynamics and control of mechanical and structural systems (EUROMECH Colloquia: 1994, 2009; IUTAM Symposia: 2003, 2010; 7th European Nonlinear Dynamics Conference, 2011; scientific events at ICTAM, ASME, EURODYN Conferences). Plenary/Keynote Lecturer at more than 20 International Conferences, he gave seminars at academic institutions all over the world. Honored with an International Conference at Virginia Tech, and a Special Issue of Nonlinear Dynamics for his 60th birthday, and a Special Issue of International Journal of Non-Linear Mechanics for his 70th birthday. Has published 142 papers in 50 different Archival Journals, 74 Book/Edited Volume Chapters, nearly 100 Refereed Conference Proceedings papers, and has edited 4 Springer volumes and 7 Special Issues in top-level Archival Journals. He has always paid a lot of effort in mentoring young students, many of whom are appointed at various Academic institutions, via also international collaborations.

His main contributions to nonlinear dynamics are concerned with cable dynamics, nonlinear oscillations, bifurcation and chaos in applied mechanics and structural dynamics from macro- to micro-scale, reduced-order modelling, control of oscillations and chaos, exploitation of global dynamics for engineering safety, smart materials, coupled oscillators, thermomechanical problems. He has used the combination of analytical, computational, geometrical, and experimental techniques needed to carefully detect and reliably characterize the variety of nonlinear and complex dynamic phenomena possibly occurring in different engineering areas.

PTG KEYNOTE

Monday, August 7
11:00am–12:00pm
Room 16

Karsten Stahl

Technical University of Munich

"Role of Gears in Electrified Vehicles"

Abstract: This presentation discusses the impact of increasing production volume of electrified vehicles on geared transmissions. Electrified vehicles impose special requirements on gears in the drive train. An outlook on chances and challenges of gears in an electrified mobile world is given.

Biography: Dr. Karsten Stahl studied mechanical engineering at the Technical University of Munich (TUM) and served as research associate at the Gear Research Centre (FZG) at TUM. In 2001 he received his PhD degree (Dr.-Ing.) in mechanical engineering and started as gear development engineer at BMW in Dingolfing, where he became head of the group "Prototyping, Gear Technology & Methods" in 2003. 2006 Stahl changed to the BMW/MINI plant in Oxford, UK, becoming department leader "Validation Driving Dynamics and Powertrain." In 2009 Stahl returned to Munich as manager for "Predevelopment and Innovation Management" within BMW Driving Dynamics and Powertrain in Munich.

2011 Karsten Stahl accepted a chair and became full professor at the Institute for Machine Elements and director of the FZG with about 80 associates, 50 of them PhD candidates, and more than 200 students. Organized in 5 departments, Prof. Stahl's research focuses on experimental and analytical investigations of endurance, tribology, NVH, materials and fatigue life analysis. In the focus of his research are components like cylindrical-, bevel-, hypoid- and worm-gears, clutches, synchronizers, rolling element bearings and drive systems.

Prof. Stahl is board member of the WiGeP and several other scientific associations, convener of ISO/TC 60/SC 2 working group 6, editor in chief, editor and associate editor of several scientific journals, president and scientific committee member of several national and international conferences and holds the VDI ring of honor. He has published more than 100 scientific papers and presentations.

PTG KEYNOTE

Tuesday, August 8
11:00am–12:00pm
Room 16

Avinash Singh

Global Propulsion Systems General Motors

"Role of Transmissions in Enabling Vehicle Fuel Economy"

Abstract: In this presentation, some of the emerging trends in vehicle technologies will be reviewed. These trends are driven by fuel economy, drivability, and safety challenges facing the automotive industry. Often times, these technologies pose unexpected challenges for the automotive transmission. The innovation needed within the transmission to enable these technologies will be explored.

Biography: Dr. Avinash Singh is an Engineering Group Manager in the Global Transmission and Electrification Advanced Engineering organization of General Motors. He leads advanced technology development for all Transmission and Electric/Hybrid Drive Unit Components and Subsystems, including gear systems, continuously variable units, bearings, torque converters, clutches, structures, and pumps.

Dr. Singh received his BS degree in Mechanical Engineering from IIT Varanasi (BHU), India, and his M.S. and Ph.D. degrees in Mechanical Engineering from the Ohio State University, Columbus, OH. He currently serves on the Board of trustees of the not-for-profit Gear Research Institute

(GRI) at Penn State. He had served two terms as an Associate Editor of the ASME *Journal of Mechanical Design*. He is also a past chair of the ASME Power Transmission and Gearing Committee.

Dr. Singh has authored numerous journal and conference papers and has 9 patents issued/pending. He has been recognized with the Boss Kettering Award, GM's highest technical honor. He is a Fellow of the ASME.

VIB KEYNOTE – DEN HARTOG AWARD LECTURE

Monday, August 7
9:10am–10:50am
Room 26 A

K. W. Wang

University of Michigan - Ann Arbor

"Inspired by Nature – Adaptive Modular Metastructures"

Abstract: During the past few decades, due to the advances in materials, electronics, and system integration technologies, structural dynamics and controls researchers in various engineering disciplines (e.g., aerospace, civil, mechanical) have been investigating the feasibility of creating adaptive structures. The vision is to develop a multifunctional structural system that has various embedded and distributed autonomous functionalities, such as vibration and stability controls, shape reconfiguration and morphing, materials and mechanical property variations, energy harvesting, and health monitoring and healing. From a structural system point of view, one of the major challenges is on how to best synthesize the cross-field and local-global coupling characteristics of the various adaptive materials and elements to optimize the overall structure performance. In recent years, interesting approaches have been explored to achieve adaptive meta-structures based on synergistic modular architectures, often observed in nature, such as in biological or atomistic systems. It is recognized that to achieve significant new advances in adaptive structural systems, researchers have to conduct even more cross talks among various fields. This presentation will discuss some of the recent interdisciplinary research efforts in synthesizing nature-inspired adaptive metastructures for structural mechanics, vibration and wave adaptation and controls.

Biography: Dr. Kon-Well Wang is the Stephen P. Timoshenko Professor and Tim Manganello/BorgWarner Department Chair of Mechanical Engineering at the University of Michigan. He received his Ph.D. degree from the University of California at Berkeley in 1985, worked at the General Motors Research Labs as a Senior Research Engineer, and then started his academic career at the Pennsylvania State University in 1988. At Penn State, Professor Wang has served as, among others, the William E. Diefenderfer Chaired Professor in Mechanical Engineering, Director of the Structural Dynamics and Controls Lab, Associate Director of the Vertical Lift Research Center of Excellence, and Group Leader for the Center for Acoustics and Vibration. He joined the University of Michigan in 2008.

Professor Wang's main technical interests are in structural dynamics and vibrations. His work has created new emerging directions in the field via exploring piezoelectric circuitry networks, multistable & metastable modular structures, fluidic cellular-composites and origami, and nano-composites. He has developed knowledge and methodologies to synthesize novel adaptive structural systems for advancements in vibration control and damping, vibration confinement and localization, vibration energy harvesting, damage identification, wave propagation tailoring, shape morphing, and energy trapping & absorption. Professor Wang is a Fellow of the ASME, the Institute of Physics (IOP), and the American Association for the Advancement of Science (AAAS). He has received numerous awards; including the SPIE Smart Structures and Materials Lifetime Achievement Award, the ASME Adaptive Structures and Materials Systems Award, the ASME N. O. Myklestad Award, the ASME Rudolf Kalman Award, the ASME Adaptive Structures and Material Systems Best Paper Awards, the NASA Tech Brief Award, and the SAE Ralph Teetor Education Award. He has delivered many Keynote/Plenary lectures at ASME, SPIE and AIAA conferences in the U.S., as well as at various international conferences in Europe and Asia.

Professor Wang has provided extensive service and leadership to the professional community. He has chaired the ASME Technical Committee on Vibration and Sound, the ASME Mechanical Engineering Department Heads Executive Committee, and various standing committees for the ASME. He has been a member of the ASME Design Engineering Division Executive Committee and Technical Branch/Committee in Adaptive Structures in ASME and AIAA. He has organized and led various workshops and conferences, such as the SPIE Damping and Isolation Conference and the ARO Workshop on Smart Structures. He has been involved in many editorial activities, including served as the Chief Technical Editor for the ASME Journal of Vibration and Acoustics. He is currently an Editorial Advisory Board Member for the Journal of Sound & Vibration, an Editorial Board Member for book series on Computational and Experimental Methods in Structures, and an Associate Editor for the Journal of Intelligent Material Systems & Structures.

VIB KEYNOTE – MYKLESTAD AWARD LECTURE

Tuesday, August 8
11:00am–12:00pm
Room 26 A

I. Y. (Steve) Shen

University of Washington Seattle

"Development of Lead-Zirconate-Titanate (Pzt) Thin-Film Microactuators dor Inner Ear Hearing Rehabilitation"

Abstract: Hearing loss is a common disability in aging seniors and people who work long hours in noisy environments. For patients who are nearly deaf, surgeons often place an electrode array in cochlea, known as a cochlear implant, to stimulate auditory nerves. Recent medical research indicates that combination of a cochlear implant (electric-based) and a traditional hearing aid (acoustic-based) has proved to enhance speech recognition significantly. A grand challenge is to develop an intra-cochlear acoustic microactuator to realize the combined stimulations. A successful development requires fusion of knowledge from various fields, including vibrations, acoustics, material science, micro-fabrication, smart materials, mechatronics, cochlear mechanics, and audiology.

In this presentation, I will discuss design, fabrication, and testing of a piezoelectric-based intra-cochlear microactuator. The microactuator employs a lead-zirconate-titanate (PZT) thin film to transversely vibrate a diaphragm of size "0.8 mm × 0.8 mm × 2 μm" to generate pressure waves in cochlea. Major challenges affecting its vibration performance include electric circuit layout, electrode size, residual stresses, piezoelectric coefficients measurements, and fabrication processes. Testing in an aqueous environment shows that surrounding liquid presents significant added mass. Experimental measurements also indicate that the acoustic microactuator may experience a snap-through phenomenon. Finally, an acute animal test confirms that the intra-cochlear microactuator does produce pressure waves audible to the animal.

Biography: Dr. I. Y. (Steve) Shen is a Professor of Mechanical Engineering Department of the University of Washington. He received his BS and MS degrees from National Taiwan University, and his PhD degree from the University of California, Berkeley, all in Mechanical Engineering.

Professor Shen's general research area is vibration, dynamics, sensing, and actuation. In particular, his expertise includes PZT thin-film micro-sensors/actuators, insect dynamics, medical devices, and spindle and rotor dynamics. In the areas of PZT thin films, he is developing micro-sensors and actuators for various future applications, such as structural health monitoring sensors and hybrid cochlear implants. In the area of insect dynamics, he is studying vibration of flapping wings and pulsating thorax in order to develop sensors and actuators for motion control and guidance of flapping-wing micro-aerial vehicles. In the area of medical devices, he is developing microphones and microactuators to enable intra-cochlear hearing aids. He is also developing clinical tools to nondestructively evaluate dental implant stability. In the area of spindle and rotor dynamics, he is developing computational algorithms to predict vibration of complex rotating machines, such as hard disk drives and cyclic symmetric rotors.

Professor Shen is a Fellow of American Society of Mechanical Engineers (ASME). He is currently the Technical Editor of ASME Journal of Vibration and Acoustics.

CIE-27-1 – INDUSTRY PANEL

Collaborative Engineering During the Age of Digitalization?

Monday, August 7
9:10am–10:50am
Room 4

This industry session focuses on transformative changes to engineering practice resulting from disruptive technology and evolving business needs. For example, from a technology perspective, developments in 3D printing and internet of things are motivating manufacturers to invest in new product design approaches. The new technologies both expand and change engineering priorities needed to ensure structural integrity, product reliability, and greater flexibility to deliver more individualized products.

From a business perspective, a growing number of stringent yet varied regulations across global markets increase the demand for greater traceability through digital threads. The greater demand for individualized products heightens the need for systems-centric approaches to designing easily configurable products from product platforms. Increasingly, engineers will also need to engage in engineering for agile manufacturing, delivering factory layouts and equipment designs that enable rapidly reconfiguring processes and equipment layouts to deliver more products in smaller batches. The trend towards more individualized manufacturing and service of products further heightens the need for digital threads to record and trace changes. There is also growing interest high fidelity computer models of products throughout their service life called digital twins Manufacturers intent for digital twins to document product changes and support decision making throughout product lifecycles.

PANELISTS

Marc Halpern
Gartner, Inc.

The Impact of Digitalization on Engineering and Design Priorities
Digitalization is compelling new product development leaders to rethink priorities for technologies to adopt and challenging them to change multiple facets of engineering organizations, practices, processes. This presentation summarizes findings from hundreds of manufacturers across more than ten industries and offers recommendations to navigate the changing engineering landscape.

Vijay Srinivasan
National Institute of Standards and Technology

Metrology in the Age of Digitization of Manufacturing
As manufacturing is getting digitized, the demand for measurements in manufacturing has grown in scope and complexity. The growth of Internet of Things (IoT) makes it easier to collect and communicate data, but challenges remain in ensuring the quality of such data and in our ability to process that data. In this talk I will outline some of the metrology problems NIST tackling with industry, with particular focus on computational coordinate metrology.

Brian Thompson
PTC

The Impact of Physical/Digital Convergence on Engineering
As New technologies are speeding the convergence of the physical and digital worlds creating a broad array of new possibilities and challenges for engineers and their design tools. The proliferation of IoT connected products, democratization of augmented and virtual reality, and the rise of additive manufacturing for production part are just a few examples. These digital/physical boundary-crossing technologies are already changing our Computer-Aided Design and Product Lifecycle Mnagement tools, as well as how engineering, manufacturing and service professionals work with data. This presentation will explore the current and future impacts as these boundary-crossing technologies continue to gain momentum in organizations around the world.

Angela Harris
Ford Motor Company

Influence of Emerging Trends on Technology Development for Vehicle Interior Environments
In a rapidly changing automotive market influenced by societal and technological trends, an OEM's ability to connect with customers and deliver holistic experiences that meet their needs is essential. Systems engineering, interdependency linkages and the integration of customer feedback throughout a technology's development cycle is required to effectively bring early concepts and ideas to implementation in Ford vehicles. The acceleration of customer driven technologies must still be balanced with the stringent requirements auto manufacturers face for performance, cost, weight, regulations and environmental impact. This talk will focus on several examples within Ford Research that highlight how the customer mind-set and emerging trends is changing the development process of novel materials and interior technologies.

CIE-28-1 – PANEL

From a Researcher/Technology Developer to an Advanced Technology Visionary/Facilitator – A Perspective

Monday, August 7
2:00pm–3:40pm
Room 3

In this session panelists from government, academia, and industry will share their career experiences about how they progressed from individual researchers to lab directors and respected research leaders who select research areas for their organizations to pursue and work to transition research results to develop new technologies and products. Panelists will also discuss their current research and how it is being used to facilitate the advancement of the current state of the art in their individual fields.

PANELISTS

Richard A. Vaia
Wright-Patterson AFB

Aerospace Materials: Disrupting the Supply Chain
Materials are key to the fruition of revolutionary technologies, and thus future capability. They are the stuff that engineers innovate with, and thus must be risk-reduced and available in the supply chain to impact cutting edge concepts. Understanding what factors into the business case and what are the competing technologies is foundational to the success of military R&D laboratories in guiding development of new materials and manufacturing – design tools within the defense ecosystem. Not only experience, but an active partnership with academic science through research and system engineering is paramount in balancing an R&D organization's investment between long-term competency development and product demonstration.

Eric Wong
Raytheon Corp.

Robust Design for Advanced Microelectronic Packages
As electronic system become more complex, the ability to maintain the structural integrity of the system while protecting the sensitive electronic components is becoming increasingly difficult to achieve and to evaluate. Current advances in microelectronics package design will be reviewed. Methods that have been developed which couple computational analysis with statistical methods to evaluation these designs and systematically identify critical design and process parameters will be presented. The benefits of the implementations of these methods to the development of robust microelectronic package designs will be demonstrated.

Rajit Gadh
University of California – Los Angeles

Smart Grid via Distributed Coupling of Solar Photovoltaics, Electric Vehicles, and, Battery Energy Storage Systems
The North American electric grid today is witnessing the fastest pace of change since its creation about one hundred years ago. States such as California have seen a substantial rise in the amount of energy generated from solar photovoltaics (PV) on rooftops. These renewable energy resources, being intermittent, can potentially destabilize the grid when scaled up to the level of the entire grid. Electric vehicles (EVs) are being added at a significant pace in California thereby increasing the load on the grid at various times of the day. While they may be considered as a load, their batteries may be exploited as battery energy storage system (BESS) devices thereby becoming an asset to compensate for the instability resulting from intermittency caused by renewables. The continuous decline in the cost of solar PV and lithium ion batteries for EVs is expected to further propel their growth resulting in further increase in complexity of balancing the demand and supply of electricity. Management and control of each of these distributed energy resources (DERs) – generation, storage and consumption – is a major area of research for the UCLA Smart Grid Energy Research Center (SMERC). The integration of advanced technologies, consumer preferences and innovative pricing models to address the above opportunities and challenges would achieve a modern grid that allows for higher penetration of renewables, increase in the number of electric vehicles, higher energy efficiency, improved grid security and resiliency, and, reduced outages.
In the context of the above issues, the talk will present two relevant research projects that UCLA's Smart Grid Energy Research Center (SMERC) has been involved with.

Jay Lee
University of Cincinnati

Trends and Recent Advances of Industrial Big Data Analytics, AI, and Cyber Physical Systems for Smart Manufacturing Transformation
Industrial Big Data Analytics, Machine Learning, and Cyber Physical Systems are changing the way we design product and service systems. It is clear that as more sensors and smart analytics software are integrated in industrial products and manufacturing systems, predictive technologies can further learn and autonomously optimize productivity and performance. This presentation will address the trends of predictive big data analytics, AI, and CPS for future smart industrial transformation. First, predictive analytics, AI, and Cyber-Physical System (CPS) enabled industrial systems will be introduced. Second, advanced predictive analytics technologies for self-aware industrial systems with case studies will be presented. Finally, Dominant Innovation methodology will be introduced using case studies.

Amit Bagchi
Naval Research Laboratory

A Machine Tinkerer, A Technocrat, An Inventor – Journey of One Mechanical Engineer
Abstract Not Available at Press Time

DEC-4-2 – PANEL

To Be a Makerspace or not to be: Maker Space and Machine Shop Synergies

Monday, August 7
4:00pm–5:40pm
Room 23

Some Mechanical Engineering Departments may be finding themselves at crossroads between more open maker spaces and traditional machine shops, where access is often restricted. While each of those spaces has very specific purposes, this panel will examine maker spaces as a learning environment and how they are integrated across the fabrication continuum at universities. The panel will start with each panelist introducing the maker space and/or machine shop facility at their institution and any special/unique aspect that they may have. Then we will continue with some of the following questions:

- What is the future of maker spaces, and how are students from traditional engineering backgrounds benefiting from them?
- How do traditional machine shops fit in the picture? Should shops pivot away from "production" mentality and embrace rapid prototyping? Can traditional shops and maker spaces mutually co-exist? And how do (or should) we overcome the tinkering stereotype for maker spaces?
- What are the state of the art technologies that can enhance the effectiveness of a fabrication spaces that includes a maker space and a machine shop?

Panel Sessions

IDETC/CIE

- What are the must have elements of a fabrication space for schools that are planning to design and or renovate their maker space? Should traditional shops rethink their tools and equipment to supplement maker spaces?
- What is the maker space beyond making? How do we design for this?
- How do we encourage and develop an inclusive and welcoming environment that fosters learning and engagement for all students?
- Other topics that the panelists would like to share.
- Questions from audience.

Program Moderator

Daniela Faas

Olin College

Biography: Daniela Faas, Senior Lecturer in Mechanical Engineering, Director of Design and Fabrication Operations, Olin College Prior to joining Olin College, Dr. Faas was the senior preceptor in design instruction at the John A. Paulson School of Engineering and Applied Science at Harvard University. Dr. Faas was a Shapiro postdoctoral fellow in the Mechanical Engineering Department at MIT after receiving her Ph.D. in Mechanical Engineering and Human-Computer Interaction from Iowa State University. Dr. Faas graduated from Bucknell University with her M.S. in Mechanical Engineering and joint B.S./B.A. in Mechanical Engineering and International Relations. Dr. Faas is currently a research affiliate in the Department of Mechanical Engineering at MIT. Her research focuses on developing low cost immersive Virtual Reality applications for products and systems, early stage design process and methodology and engineering education.

PANELISTS

Sunand Bhattacharya

Autodesk, Inc.

Biography: As part of the Autodesk Education Experience Group, Sunand Bhattacharya manages its Learning Futures team. In this role, he is responsible for the strategy, management and evangelization of Autodesk's future influence advocacy in global academia. Sunand is a graduate in Industrial Design from the National Institute of Design (NID) in India and holds his terminal graduate degree in Industrial Design and Human Factors from The Ohio State University.

Robert Nagel

James Madison University

Biography: Since joining James Madison University, Nagel has helped to develop the Department's six course engineering design sequence, and he is lead instructor of the two-course, client-based sophomore design experience. Nagel earned his Ph.D. from Oregon State University, his M.S. from the Missouri University of Science and Technology, and his B.S. from Trine University—all three in mechanical engineering. Nagel, a strong proponent of undergraduate research, performs research related to understanding how interventions impact students' abilities to design and understand systems. Currently, Nagel is investigating the impact of functional modeling on students' ability to understand, represent, and design systems, and the impact of student engagement in university maker spaces on students' design self-efficacy and student learning.

Jesse Austin-Breneman

University of Michigan

Biography: Austin-Breneman earned his PhD from MIT and was a postdoctoral research associate in the MIT Ideation Lab and the MIT Global Engineering and Research Lab. His research focuses on system-level approaches to difficult engineering design problems, such as large-scale complex system designs and product design for emerging markets. His work uses empirical studies, practitioner interviews and simulations to gain insight into issues facing multi-disciplinary design teams working in these fields. He is particularly interested in how teams manage competing objectives throughout the design process and formal strategies for helping them do so. Austin-Breneman leads the Global Design Laboratory and he is the faculty advisor for BLUElab, a sustainability engineering student organization.

CIE-7-1 – PANEL

Additive Manufacturing in Aerospace, Defense and Automotive Industries: Status and Promises

Tuesday, August 8
8:00am–9:00am
Room 5

This CIE-AMS panel will discuss the opportunities and challenges on designing and developing new components with high quality for aerospace, defense, and automotive industries using various 3D printing or additive manufacturing (AM) technologies. AM offers numerous advantages including the capability of producing sophisticated and customizable components, multi-material utilization, reduction in production time and flexibility to be used for the variety of repairs, and freeform fabrication. In particular, the industries also want to explore new designs for functional components and sensors for Industry 4.0 and Internet of Things using AM technologies (Design for AM). These design methods need to be applicable to not only future products, but also current products. And this research provides an indication of the "optimal" design for a given product with respect to cost, including quality control, materials, features, manufacturing, testing and inspection, maintenance, etc. The panelists will focus one R&D investments in public-private partnerships, R&D Roadmap, market maturity, industry best practices, the role of standards in AM, and quality control management.

PANELISTS

Timothy W. Simpson
Penn State University

Biography: Dr. Simpson is the Paul Morrow Professor of Engineering Design and Manufacturing at Penn State. He has affiliations in Information Sciences & Technology and Architecture and is the co-Director of CIMP-3D (www.cimp-3d.org). He has been PI or Co-PI on over $25M in funding for his research in additive manufacturing and 3D printing, product family and product platform design, and multidisciplinary design optimization, and he has published over 300 peer-reviewed papers and edited two textbooks. He has collaborated on projects with a variety of companies, including Bayer Material Science, Boeing, GE, GM, LG, LORD Corporation, Schlumberger, United Launch Alliance, United Technologies, and Volvo. He teaches courses on Mechanical Design, Industrial Systems Design, Concurrent Engineering, Product Family Design, and Additive Manufacturing. He is a recipient of the ASME Ben C. Sparks Award, the ASEE Fred Merryfield Design Award, and a NSF Career Award. He is a Fellow in ASME and an Associate Fellow in AIAA. He is Chair of the ASME Design, Manufacturing, and Materials Segment Leadership Team and is Past Chair of the ASME Design Engineering Division (DED) Executive Committee. He helped ASME launch the Innovative Additive Manufacturing 3D (IAM3D) Design Challenge in 2014 and served as Chair of the Executive Advisory Committee for the 2015 and 2016 ASME Additive Manufacturing and 3D Printing Conference. He received his Ph.D. and M.S. degrees in Mechanical Engineering from Georgia Tech and his B.S. in Mechanical Engineering from Cornell.

John Michopoulos
Naval Research Laboratory

Biography: As the head of Computational Multiphysics Systems Lab at the Naval Research Laboratory (NRL) at Washington D.C., Dr. Michopoulos oversees multi-physics modeling and simulation research efforts, including establishing the science behind additive manufacturing processes and linking performance to material properties through mechatronic/robotic data and specification-driven methodologies. He pioneered the development of the robotic multiaxial testing for the data-driven inverse multi-scale characterization of anisotropic materials. He is currently the principle investigator of a new grand challenge effort on "The Science of Layered Deposition Processes for Novel Materials" involving four divisions at NRL. His participation in this panel will reflect his insight as developed throughout this program.

He has authored and co-authored more than 260 publications and is the co-inventor of 9 inventions. He is a fellow of the ASME and has been honored with numerous international and national awards including the P.S. Theocharis award from the National Academy of Athens, the 2014 Innovator of the Year award from Wolfram Inc, the 2015 Research Excellence award by ASME's CIE division and several best paper awards from the ASME's CIE division for papers presented in CIE conferences.

He holds a M.Sc. in Civil Engineering and a Ph.D. in Applied Mathematics and Mechanics from the National Technical University of Athens, and has pursued post-doctoral studies at Lehigh University on computational multi-field modeling of continua and Fracture Mechanics.

CIE-20-1 – SEIKM PANEL

Smart and Connected Vehicles – Coming Soon to a Place Near You!

Tuesday, August 8
11:00am–12:00pm
Room 5

We live in a connected world today surrounded by a network of personal mobile devices, electronic gadgets and appliances, smart buildings, and finally automobiles – seamlessly connected and integrated into a smart technology ecosystem called the Internet of Things (IoT). With a variety of infotainment services and connected car applications for drivers, the automotive industry is becoming an IoT champion. However, IoT has a bigger role in the automotive industry than just enhancing end customer experiences. This panel will focus on how IoT is revolutionizing traditional auto manufacturing processes such as design, material, assembly, and quality control – while also enabling personalized in-car experiences and services that enhance the connected lifestyle of customers, including their broader safety, health and wellness. The panel will include members from both industry and academia who would share their visions as well as foster lively discussions on the growing importance of IoT in various domains of the transportation industry over the coming years, especially as self-driving cars hit the road.

CIE-24-1 – PANEL

Advancement in Digital Technology Systems, Usage of VR and Tools for Design Engineering

Tuesday, August 8
11:00am–12:00pm
Room 3

The purpose of this VES panel is to encourage discussion and exchange of views about current and new trends for Virtual and Immersive/Blended Systems and the transference of knowledge over multiple domains.

As the market and/or industrial interest in virtual environments increase, new technologies and techniques are proposed. In recent years we have observed a trend on the use of low-cost devices, sometimes taken from the gaming industry in industrial applications.

Furthermore, companies are investing billions into making immersive virtual worlds and augmented reality widely available to mainstream public in mass quantities (i.e., especially for “gamer” consumers but also a wide range of other applications). We have also seen a trend in customization. Nowadays, thanks to the availability of 3-D AM technologies as well as open-source electronic prototyping platform, custom interfaces can be easily designed and build.

In addition to the above, we have observed a shift of interest from Virtual Environment to Mixed ones, sometimes called Augmented, sometimes named “Blended.” As the number of applications increases, new challenges are presented to the scientific community.

The various issues and topics will be presented and discussed by the panel. Videos and demonstrators are part of this session. You are invited and welcome to participate in this event.

PANELISTS

Pramita Mitra
Ford Motor Company

How VR is Changing the Face of Automotive User Experience
VR Technology is transforming the way we experience and buy cars. Recently there is an increased emphasis from all automakers of digitizing the dealership experience – for making car browsing and purchasing more accessible and fun for consumers. VR allows users to take part in a virtual self-guided tour in learning about the various features, details, and options associated with a vehicle – and as well as virtually test drive their vehicle in a variety of environments. The same approach can be applied to other automotive learning scenarios, such as design, training and trouble-shooting assistance. Recently Mixed Reality (MR) solutions are also becoming popular for further augmenting the automotive user experience. MR allows for physical and digital objects co-exist and interact in real time – thus making the experience more human, interactive, and entertaining. This talk will discuss a few industry solutions to highlight how VR and MR technologies are changing the user experience in the automotive industry.

Jannicke Baalsrud-Hauge
Universität Bremen

How VR is changing the Face of Engineering Processes Through Integration and Collaboration
Related to engineering and industrial design-integration of VR in the actually engineering process, has a lot of issues, since one needs to look at the system and process integration, interaction with different systems, and the legal aspects that come into play. How VR can be integrated in education and training for production and logistics? As well as what we intend to do in collaboration with Industry for training in for example; picking and packaging and as a part of lean labs? In my talk I will also speak about a current VR-related research project ‘Beaconing’ on breaking educational barriers with contextualized pervasive and gameful learning approach.

Theodore Lim
Heriot-Watt University

Challenges for VR in the Context of Industrial Design, Engineering and Manufacturing
In recent years we have observed a trend on the use of low-cost devices, sometimes taken from the gaming industry in industrial applications. Furthermore, companies are investing billions into making immersive virtual worlds and augmented reality widely available to mainstream public in mass quantities (i.e., especially for “gamer” consumers but also a wide range of other applications). We have also seen a trend in customization. Nowadays, thanks to the availability of 3-D AM technologies as well as open-source electronic prototyping platform, custom interfaces can be easily designed and build.

Robert Wendrich
University of Twente

Challenges of Real and VR Worlds in the Context of Industrial Design, Engineering and Manufacturing
We have observed a shift of interest from Virtual Environment to Mixed ones, sometimes called Augmented, sometimes named “Blended.” As the number of applications increases, new challenges are presented to the scientific community. Synthetic computer environments, that enhance the designer’s seeing-drawing-feeling-sculpting and provide a system that extends the designer’s repertoire of physical and virtual prototypes, enhances their ability to explore them tangibly or virtually and bring them in transaction with particular design.

CIE-33-1 – PANEL

Manufacturing Today

Tuesday, August 8
2:00pm–3:40pm
Room 3

Smart manufacturing has tremendous potential to improve quality, cost, productivity, and overall efficiency for manufacturing industries. To design and deploy smart manufacturing across the extended and networked manufacturing enterprise, the industrial internet of things will play a critical role. There are various research and technology challenges as well as opportunities, for example: information fusion; advanced sensing and instrumentation; process monitoring, control and optimization; advanced hardware and software platforms; real-time and predictive modeling; and simulation technologies that will have far-reaching impacts on smart manufacturing. This panel will explore research and development opportunities and immediate challenges in smart manufacturing technologies.

FUTURE-ME SOCIAL MEETUP – FEATURING BEST PRACTICES FOR NETWORKING

Sunday, August 6
5:30pm–7:00pm
Room 26 A&B

Jump start your conference experience and expand your professional network! Join the ECE Programming Committee for a special 1-1/2 hour networking experience of fun and socializing! Make new connections with other early career engineers sharing similar interests and/or catch-up with old friends to renew your friendships. You will get the rare opportunity to practice your networking skills, take the awkwardness out of meeting new people and win prizes, all in one big venue, during our professional speed networking social.

In addition to the social meetup, we will spotlight a panel of engineers that will cover best practices (first –hand advice and information) for networking. You will be able to ask specific questions you may have on the subject. Refreshments will be served.

Bring Plenty of Business Cards for Networking

ENGINEERING FOR GLOBAL DEVELOPMENT RESEARCH FORUM

Monday, August 7
2:00pm–3:40pm
Room 1

IDETC 2017 marks the fifth anniversary of the Engineering for Global Development (EGD) Research Forum. The EGD Forum highlights critically acclaimed research and design initiatives from academia and industry that address pressing challenges in emerging markets and developing countries. The creation, modeling, and validation of these engineering solutions are helping improve the lives of millions while also creating a foundation for economic development. Designing for impact to humanity is also a growing interest among early career engineers. The EGD Forum will continue placing a spotlight on work that combines academic research with product development and commercialization to achieve scaled impact to society. The keynote address and lighting talks will be followed by an interactive panel discussion with the audience. Talks and the Q&A session will be recorded and posted on ASME.org. This event is co-hosted by the Design Automation Conference (DAC), Design for Manufacturing and the Life Cycle Conference (DFMLC), Mechanisms and Robotics Conference (MR), and ASME Engineering for Global Development.

KEYNOTE SPEAKER

Maurizio Vecchione

Intellectual Ventures

Impact Inventing for Humanity

A few trends are converging to create new development models for science and engineering to engage with the 3.5 Billion people living in the world's developing economy. These models promise to improve healthcare and lift millions out of poverty through the appropriate use of technological innovation. But what are the sustainable models – the drivers and challenges to create sustainable technology for humanity? Why do so many good ideas and well intentioned efforts fail to achieve scale? We will use case studies from the work of Global Good, the collaboration between Bill Gates and Intellectual Ventures to invent for humanity and one of the world's leading inventors for humanitarian purposes, to explore the best practices and challenges of Research and Development for low-resource nations. We will also explore the role the developing world is assuming in reverse innovation, whereby technologies are leapfrogging and disrupting established markets from the developing world to the first world.

Biography: Maurizio Vecchione is executive vice president of Global Good and Research at Intellectual Ventures (IV). In this role, he oversees Global Good, IV's collaboration with Bill Gates to invent and deploy technology specifically focused on improving life in developing countries, as well as the research and operations of the IV Laboratory and Institute for Disease Modeling. Mr. Vecchione most recently served as CEO of Arrogene, which is commercializing a new nanotechnology platform for cancer-targeted therapeutics and diagnostics, and as CEO of telemedicine pioneer CompuMed.

Under Mr. Vecchione's leadership, Global Good and IV Lab are engaged in cutting-edge research and invention for the benefit of humanity around global health and global development priorities. In global health, Global Good and IV Lab are involved in new diagnostic technologies for infectious diseases, such as malaria and tuberculosis, enhanced vaccine delivery technologies, and maternal and child health, as well as the Institute for Disease Modeling efforts to shape infectious disease policy and programs with data-driven analysis. In global development, Global Good and IV Lab focus their work on malnutrition, agricultural productivity, and livestock and dairy value chain improvements for the developing world, with a particular emphasis on the needs of smallholder farmers.

Mr. Vecchione has nearly 30 years of experience in research and the technology sector. He has contributed to building nine start-ups and helped launch more than 50 commercial products, resulting in more than $1 billion in shareholder value. His work spans the software, internet, wireless and life sciences sectors, primarily in connection with translational sciences for science derived from government and academic research and development efforts.

Mr. Vecchione is also involved in a number of nonprofit initiatives, including as a co-founder and member of the board of ReefQuest. This global organization focuses on fostering marine environmental stewardship in children through citizen science.

An inventor himself, Mr. Vecchione is named on multiple U.S. patents and patent applications related to imaging, image processing, and nano-bio-polymer and telecommunications technologies. He was twice a finalist for the Ernst & Young Entrepreneur of the Year award and received a DEMO God award from the prestigious DEMO organization. He is a member of the American Association for the Advancement of Science, the Association for Computing Machinery, and the Institute of Electrical and Electronics Engineers (IEEE). He is also a member of the IEEE Spectrum editorial advisory board.

LIGHTNING TALKS

Karl Schmitt

Caterpillar Inc.

Caterpillar Microgrids – Powering Communities and Industry

With more than 1.2 billion people lacking access to power, the global Microgrid Market is expected to surpass $35 billion by 2022. Companies like Caterpillar who understand distributed generation have played a critical role in the development of this highly innovative market. The Cat Dealer Network now offers microgrid solutions to remote communities and a variety of industries by leveraging technology from other markets (and products). This talk will discuss Caterpillar's role in developing the market and the various technologies it deploys through the Cat Dealer Network.

Biography: Karl Schmitt has over 15 years of distributed generation experience within Caterpillar and the Caterpillar Dealer Network. His career has focused on power systems product support and renewable energy management. Karl is currently responsible for deployment of microgrid solutions via the Global Caterpillar Dealer Network. Previously, he developed and led Empire Southwest's (Empire-Cat) renewable energy efforts as General Manager of Empire Renewable Energy, LLC. Empire Renewable Energy focused on providing turn-key photovoltaic systems to commercial and industrial clients. During his tenure at Empire he also led the Power Systems service department. Karl started his career at Caterpillar, Inc as both a service and product support field manager with an assignment as a Six Sigma Black Belt. He earned a degree in Manufacturing Engineering at Missouri University of Science and Technology (formerly University of Missouri-Rolla) and an MBA from the WP Carey School of Business at Arizona State University.

Kathleen Callaghy

Global Alliance for Clean Cookstoves

Cooking in Crisis: Energy Access for Displaced People

Over 125 million people are in need of humanitarian assistance today. A robust community of international aid agencies and NGOs exist to provide refugees and IDPs, and other crisis-affected people with food, shelter, medicine, and other essential supplies – but what about access to energy and fuel? Dry rations provided by humanitarian agencies must be cooked for long periods of time before they can be eaten, yet efficient cookstoves and fuel are rarely provided. As a result, families are often forced to spend their meagre income on cooking fuel, and many resort to skipping meals, undercooking, and other negative coping strategies to reduce costs. Women and children often risk their safety, health, and sometimes their lives to collect firewood in remote areas – only to cook over smoky, polluting fires. In an era of unparalleled human displacement, amidst concerns about global climate change, what can engineers do to help bring clean, safe, reliable energy access to people impacted by crisis? Kathleen Callaghy from the Global Alliance for Clean Cookstoves will provide an overview of existing efforts to increase energy access for displaced people, with an emphasis on cookstoves and fuels, and provide some "food for thought" on how engineers can contribute.

Biography: Kathleen Callaghy is the Program Associate for the Humanitarian program at the Global Alliance for Clean Cookstoves (Alliance), a public-private partnership hosted by the United Nations Foundation. Since 2015, she has been helping to implement the Alliance's goal of reaching the world's most vulnerable populations with clean and/or efficient cooking solutions. Kathleen coordinates the Alliance's co-leadership of the Safe Access to Fuel and Energy (SAFE) Humanitarian Working Group, a consortium of agencies working to facilitate a more coordinated, predictable, timely, and effective response to the fuel and energy needs of crisis-affected populations. Prior to working with the Alliance, Kathleen served as Program and Operations Coordinator for CLASP, an appliance standards and labeling non-profit, where she coordinated the activities of CLASP's country offices in India, China, the US, and the EU. Kathleen has a background in international peacebuilding, with a Masters in Comparative Ethnic Conflict from Queen's University Belfast, Northern Ireland, and a BA in Government and Legal Studies from Bowdoin College.

DFMLC-13-1: LIGHTNING TALKS ON THE SUSTAINABLE DESIGN FRONTIER

Monday, August 7
2:00pm–3:40pm
Room 22

This lightning talk session provides a brief overview of the broad range sustainability papers from the DAC, DTM and the DFMLC conferences. The purpose is to quickly raise audience awareness of the sustainability work going on across the IDETC conferences, and build a cohesive community in design for sustainability. Each speaker will present a five minute, timed 15 slide overview of their full length IDETC presentation. A broad range of cutting edge, interdisciplinary topics relevant to sustainable design will be presented.

The talks will range from design principles to data analytics, smart systems, formal methodology, tools, domain modeling, experimental studies, educational issues and industrial practices. Specific topics of interest include, but are not limited to:

- Sustainable design principles
- Sustainability of advanced manufacturing technologies
- Social factors in design and manufacturing
- Sustainability of energy systems
- Innovative life cycle assessment models
- Environmental sustainability awareness
- Smart systems for sustainability

INVITED SPEAKERS

Steve Manieri
Universita' Degli Studi Di Parma
A Life Cycle Model to Assess Costs and Environmental Impacts of Different Maritime Vessel Typologies

Amos Winter and Guillermo F. Diaz Lankenau
MIT
Design of an Integrated Cotton Picking System for Small-Scale Indian Agriculture

Jungfeng Ma
Mississippi State University
An Experimental Study of Additive Manufacturing Energy Consumption

Marcos Esterman
Rochester Institute of Technology
Implementation of an Object-Oriented Life Cycle Assessment Framework Using Functional Analysis and Systems Engineering Principles

Cassandra Telenko
Georgia Tech
Finding Causality in Socio-Technical Systems: A Comparison of Bayesian Network Structure Learning Algorithms

Samantha Janko
Arizona State University
Design of an Agent-Based Technique for Controlling Interconnected Distributed Energy Resource Transactions

Mengqi Hu
University of Illinois at Chicago
A Guided Particle Swarm Optimizer for Distributed Operation of Electric Vehicle to Building Integration

Aditi Verma
MIT
Origins of Design Principles: The Case of Nuclear Reactor Design Projects

Michel-Alexandre Cardin
National University of Singapore
Flexibility and Real Options Analysis in Design for Long Term Generation Expansion Planning of Power Grid Systems

Chris Mattson
Brigham Young University
A Simple Starting Point for Designing for and/or Assessing the Social Impact of Products

Chris Mattson
Brigham Young University
Towards a Universal Social Impact Metric for Engineered Products That Alleviate Poverty

MSNDC-17-1: AUTONOMOUS AND CONNECTED VEHICLES

Tuesday, August 8
2:00pm–5:40pm
Room 26 A

**1st half of this session includes the Lyapunov Award Lecture/Keynote* *(see page 28)*

The special session on "Autonomous and Connected Vehicles" features invited presentations by experts in the field.

INVITED SPEAKERS

Joshua Every

Transportation Research Center Inc.

Vehicle Automation – Beyond the PR
Vehicle automation systems stand to change many aspects of our society, including a fundamental change in how we approach mobility. There is a growing public perception that vehicle automation is a solved problem; though, there remain significant unanswered questions between the state of the art and the future. An overview of the on-going activity in this space provides insight into the current state of automated driving, with a focus on discussing unsettled topics in this area.

Biography: Joshua L. Every received his PhD in Mechanical engineering from The Ohio State University, with research focused on vehicle testing and active safety system development. Upon Graduation he joined Transportation Research Center Inc. (TRC Inc.) as a research scientist contracted to NHTSA's Vehicle Research and Test Center (VRTC) focusing on developing testing procedures to verify the safety of automated vehicles. Recently, Josh transitioned to TRC's R&D division to become the Automated Vehicle and ADAS Lead, in conjunction with the construction of TRC's SMART Center. His current work is focused on creating testing methods for vehicle automation systems, and developing procedures to ensure the safety of controlled environment testing and on-road deployments.

Eric Nutt

Mandli Communications

The Challenges of an Effective Base Map for Autonomous Vehicles

Autonomous Vehicles (AVs) are a hot topic right now. Most major automobile companies are projecting near-future timelines for commercial vehicles with advanced autonomy. There is also general agreement that, in order for AVs to become a reality, a Base Map must be created and maintained. There exist numerous challenges to achieving a usable Base Map including collection and processing of data, accuracy, ownership, update frequency, communication, insurance, and standards just to name a few. In this presentation we will explore several of these challenges as they relate to the future computational requirements of AVs, and of the infrastructure required to support them.

Biography: Eric Nutt is the Head of Technology for Mandli Communications, Inc., a high-tech solutions company developing large-scale data collection and processing systems that support our State DOTs in their mission to reduce traffic deaths to zero by converting vast information into actionable intelligence.

Before taking on the challenges of strategic planning at Mandli Communications, Eric oversaw the research and development of data collection vehicles and data processing software — leveraging his Electrical Engineering and Computer Science degrees from UW-Madison to establish Mandli Communications, Inc. as the leader of large-scale network data collection and delivery projects across the country.

Passionate about employee empowerment and engagement, Eric leverages his knowledge and experience to help build and coach successful agile teams.

Carmine Senatore

Exponent, Inc.

Automated Vehicles: Current Landscape and Future Directions

In the last decade automated vehicles (AV) have quickly transitioned from research lab concepts to becoming an impending reality. With the recent release of the Federal Automated Vehicles Policy (FAVP) the National Highway Traffic Safety Administration (NHTSA) introduced a framework to foster and guide AV testing and ultimately deployment. The fast paced evolution, motivated by the desire of enhanced safety, increased mobility and higher efficiency has been facilitated by the advancement in sensing, processing, and ultimately computing power. Yet scientists, researchers, and engineers still face hurdles to bring this technology to market. This presentation will provide an overview of latest AV developments including challenges and opportunities for researchers in this area.

Biography: Dr. Senatore is a Senior Associate at Exponent, Inc. specializing in advanced driver assistance systems (ADAS), vehicle-to-vehicle communications (V2V), automated vehicle technologies, and on-road and off-road vehicle dynamics. He has experience with robotic systems, image processing, and sensing technologies, with application to the defense, space, automotive, agricultural, and mining industry. Since joining Exponent, he has designed and conducted experiments to investigate sensor fusion strategies for V2V safety applications and the use of automotive advanced sensors for the purpose of accident investigations. Dr. Senatore obtained his Ph.D. in Engineering Mechanics at Virginia Polytechnic Institute and State University. Prior to joining Exponent, Dr. Senatore was a research scientist at MIT, where he collaborated with national agencies, research institutions, and private companies to study how vehicles and robotic systems interact with unstructured environments. He has developed extensive knowledge of vehicle mobility analysis, including the development of strategic and tactical tools to support NASA Mars Science Laboratory (MSL) and Mars Exploration Rover (MER) missions.

DFMLC-12-1: NSF CAREER PROPOSAL WRITING WORKSHOP – HOSTED BY DFMLC

Wednesday, August 9
8:00am–11:40am
Room 21

This workshop, integrated with the Design for Manufacturing and Life Cycle (DFMLC) Technical Conference, will provide an opportunity for PhD students, postdoctoral fellows, and faculty to learn how to frame research objectives and develop research plans in ways that lead to competitive research proposals, particularly for submission to the National Science Foundation. Participants will have the opportunity to interact with NSF personnel directly, and obtain an accurate concept of the distinctions between competitive and non-competitive research proposals. Students and faculty at all stages of their careers are likely to benefit from this workshop.

INVITED SPEAKERS

George Hazelrigg

National Science Foundation, CMMI

Biography: George Hazelrigg enjoyed designing and building things when he was young, so he decided to go to college to study engineering. He obtained a BS in mechanical engineering from Newark College of Engineering (now New Jersey Institute of Technology) and went to work for Curtiss-Wright. There, he found that his education had utterly destroyed his abilities to do engineering design. So he felt it necessary to get a master's degree. He completed an MS in mechanical engineering, also from NCE, but still hadn't regained his design abilities. While getting his MS, however, he did some teaching and liked it. So he figured that, if he couldn't do design, the next best thing would be to teach it. Five years later, he had obtained MA, MSE, and PhD degrees in aerospace engineering from Princeton University. Now, in addition to not knowing how to do design, he couldn't teach it either. For the next 25 years, he roamed industry and academe in an attempt to understand the theory of engineering design, including time spent at the Jet Propulsion Laboratory, General Dynamics, Princeton University and a consulting firm of which he was a co-founder. He also spent a year in Korea helping to found the Systems Engineering Department of Ajou University. He joined the National Science Foundation in 1982 and, in 1996, became program director for the Engineering Design program where, for eight years, he provided support to others in the field. In January, 1996, he did a stint as Station Science Leader of the U.S. South Pole station. In 2004, he became Program Director for the Manufacturing Machines and Equipment program and, since the formation of the CMMI Division, he has been Deputy Division Director. For relaxation, he spends his weekends soaring over the Shenandoah Valley, and he is a certified flight instructor in gliders (CFI-G) with about 1,900 total flying hours.

Richard Malak

National Science Foundation

Biography: Dr. Richard Malak currently serves as Program Director for the ESD, SYS and DEMS programs in the Division of Civil, Mechanical and Manufacturing Innovation (CMMI) of the National Science Foundation. He holds an academic appointment at Texas A&M University where he is Associate Professor and Morris E. Foster Faculty Fellow I in the Department of Mechanical Engineering. His personal research interests include decision making in systems engineering and computational design methods. He holds a BS in Electrical Engineering from SUNY Stony Brook, an MS in Electrical and Computer Engineering from Carnegie Mellon University, and MS and PhD degrees in Mechanical Engineering from the Georgia Institute of Technology.

INDUSTRIAL COLLABORATION PANEL

Wednesday, August 9
10:00am–11:40am
Room 1

Industrial development efforts, like technical work in other venues, can benefit from multiple approaches to design optimization or technical issue resolution. Leveraging creative approaches from multiple communities, disciplines, and technical backgrounds may produce better, more robust product designs, resolve issues, or otherwise improve process and product development for the benefit of a company. Corporate budgets are typically constrained, and it is expensive to keep a varied technical staff on hand just in case the latest technical challenge requires or could possibly benefit from a particular approach or technical perspective. On the other hand, university faculty represent an enormous pool of deep technical expertise in a wide spectrum of engineering and science disciplines. Furthermore, faculty members who work on industrial problems may benefit from their perspective and insights gained through their involvement in product development initiatives and issue resolution. How specifically can a company benefit from involving academic researchers in their product development efforts? What benefits do academic researchers gain from an association with industrial development? What are the difficulties and challenges inherent to building cross-community teams? This panel discussion will attempt to address these questions through presentation of particular examples of company and university joint work.

PANELISTS

Brian Olson

Johns Hopkins University

Biography: Dr. Brian Olson is a Senior Engineer and Section Supervisor in the Air and Missile Dense Sector at Johns Hopkins University Applied Physics Laboratory (JHU/APL), the largest university affiliated research center in the nation. Dr. Olson joined JHU/APL in 2006 after receiving the BS, MS and PhD degrees from Michigan State University. He leads a team of engineers to apply innovative dynamics tools and methodologies to solve complex interdisciplinary problems that affect programs of national importance.

James Redmond

Sandia National Laboratories

Biography: Jim Redmond is a Senior Manager at Sandia National Laboratories, leading the Structural Mechanics Group with responsibility for stewarding computational simulation capabilities to support a diverse set of National Security applications. He has been with the labs for 24 years serving as post-doc, staff, and manager. Among his technical contributions, Jim developed control schemes to improve precision manufacturing processes and helped establish R&D programs in Microscale Dynamics, coupled Structural Acoustics, and Re-entry simulation. He has been called upon to support national emergency response teams, including the NTSB I-35W Bridge Collapse, The Deep Water Horizon Accident, and the Waste Isolation Pilot Plant Technical Assessment Team. Jim holds BS and MS degrees in Aerospace Engineering, and a Ph.D. in Mechanical Engineering all for North Carolina State University.

Mary Baker

ATA Engineering Inc.

Biography: Dr. Mary Baker is President and Technical Director of ATA Engineering Inc. She received a B.S. in Engineering Mechanics from the University of Wisconsin, a M.S. and Ph.D. from Caltech and in 2014 was awarded the Caltech Distinguished Alumni Award for leadership in Aerospace. Mary was part of a team that has brought new methods in structural dynamics and mechanical CAD to aerospace projects including a leadership role in the development and support of the space shuttle, space station, Delta and Atlas Launch vehicles, the RL10A, B, C and J-2X rocket engines, loads analysis of the Mars Science Laboratory, and structural evaluation of the James Webb Space Telescope. Throughout this project work the role and focus of Mary and the ATA team has been on developing better test and analysis methods to support the design of highly engineered mechanical products.

Steve Shaw

Michigan State University

Biography: Steve Shaw serves as Harris Professor in the Department of Mechanical and Aerospace Engineering Department at Florida Institute of Technology and is also affiliated with the departments of Mechanical Engineering and Physics and Astronomy at Michigan State University. He earned his PhD in Theoretical and Applied Mechanics from Cornell in 1983. His interests are in the general field of dynamics and vibrations of mechanical systems with an emphasis on understanding and utilizing nonlinear behavior for engineering applications. His current research activities focus on the interplay of nonlinearity and noise in small-scale vibrational devices, the design of micro- and nano-scale resonators for sensing and signal processing applications, and the development of vibration absorbers for use in automotive powertrain components. He is a currently a member of the Steering Committee for a £4.5M multi-university/ industrial EPSRC grant on Engineering Nonlinearity in the UK and has served as a member of the ASME Technical Committee on Vibration and Sound and as the Vice Chair of the SIAM Dynamical Systems Activity Group. Steve frequently consults for automotive companies and legal firms. His research has been supported by the US National Science Foundation; companies such as FCA, Ford, Valeo, and Honda; and the Department of Defense through ARO, AFOSR, and DARPA. Steve is a fellow of ASME Fellow and recipient of the Henry Ford Customer Satisfaction Award, the ASME Henry Hess Award, the SAE Arch T. Colwell Merit Award, and the ASME N. O. Myklestad Award.

Bruce Geist

Fiat Chrysler Automobiles

Biography: Bruce Geist is an applied mathematician and Technical Fellow at Fiat Chrysler Automobiles, currently working in powertrain simulation and computer aided engineering. He holds a B.S. in Mathematics from University of New Mexico, and an M.S. and Ph.D. from Rensselaer Polytechnic Institute. He has been working as an applied mathematician in industry for more than 22 years, and at FCA for more than 17 years. He has published in multiple applied mathematics and engineering journals on topics ranging from engine component design and optimization to applied number theory and cryptography. He has 12 granted patents and others pending. At FCA, he has carried out applied mathematical work to assist in design and optimization of engine components and systems, transmission components and systems, vehicle calibration and control, and powertrain and vehicle efficiency. He has partnered and built collaborative relationships with university faculty from a number of different universities in an effort to deliver solutions to his employer.

MECHANISMS AND ROBOTICS STUDENT DESIGN COMPETITION

Session: MR-11-1 and MR-11-2

Monday, August 7
8:00am–9:00am and 9:10am–10:50am
Room 25B and Ballroom Foyer

Students competing in the undergraduate and graduate divisions of the Student Mechanism and Robot Design Competition will deliver a traditional technical presentation during the MR-11-1 session at 8:00am in Room 25B. Following the morning coffee break the students will then present posters detailing their design processes and completed prototypes (in the Ballroom Foyer). Judges will evaluate the quality of the work, posters, and answers to questions to help determine the competition winners.

MECHANISMS AND ROBOTICS INTERACTIVE SESSION

Session: MR-3-1 and MR-3-2

Wednesday, August 9
8:00am–9:40am and 10:00am–11:40am
Room 9 and Ballroom Foyer / 25C

The Compliant Mechanisms papers presented as lightning talks during the MR-3-1 session will be open for interactive poster presentation in session MR-3-2. Half of the papers will be open for interaction during the first part of the session, and the remaining papers for the second part so as to enable the authors to engage with each other.

See pages 126 and 133 for a list of presentations.

MSNDC PAPER COMPETITION

Session: MSNDC 18-1

Monday, August 7
9:10am–10:50am
Room 26B

Presentations will be made by the finalists of the 2017 MSNDC Best Paper Award Competition.

See page 66 for a list of presentations.

MSNDC STUDENT PAPER COMPETITION

Session: MSNDC 19-1

Monday, August 7
4:00pm–5:40pm
Room 26C

Presentations will be made by the finalists of the 2017 MSNDC Best Student Paper Award Competition.

See page 87 for a list of presentations.

ASME / NSF STUDENT DESIGN ESSAY COMPETITION

Challenges in the Design of Complex Systems

Tuesday, August 8
10:40am–12:00pm
Ballroom Foyer

Students have submitted written essays on their vision for the future of design and manufacturing. These essays have been judged by a panel of faculty from across the United States. This contest has been going on since 1998 and at least ten previous winners have gone on to become faculty members. Essay winners have received funding to attend this year's IDETC and present their work in the form of a poster. We would like to thank this year's reviewers: Bryony DuPont, Scott Ferguson, David Jensen, Kemper Lewis, Beshoy Morkos, Jitesh Panchal, Rahul Renu, and Joshua Summers.

We gratefully acknowledge support from NSF Grant Number CMII-1440457.

DFMLC STUDENT POSTER COMPETITION

Session: DFMLC-14-1

Tuesday, August 8
9:10am–10:50am
Ballroom Foyer

This student poster competition provides a platform for graduate students to present their work in a special session targeting methods, tools, and technologies advancing the field of Data Driven X for the Life Cycle. Primary drivers of each presentation are on applying data-driven techniques, including exploratory analysis, predictive analytics, and information visualization, to improve and/or understand the design of the life cycle. A primary motivator for this poster session is the recent outpour of special issue callouts in key journals, including (1) Special Issue on Data-Driven Design (D3) in the Journal of Mechanical Design and (2) Special Issue on Data Science-Enhance Manufacturing in the Journal of Manufacturing Science and Engineering. The top-4 submissions will present their poster via a 5-minute elevator pitch in front of a live panel of judges.

See page 98 for a list of presentations.

CIE GRADUATE STUDENT POSTER SESSION

Session: CIE-26-1

Tuesday, August 8
4:00pm–6:00pm
Ballroom Foyer

Each year, CIE Division invites its graduate students to prepare posters representing their research efforts, and to present this work in this session. This session serves as a forum for these students to introduce their research to the community and to receive feedback on their early efforts from the CIE community. To assist in this endeavor, CIE has sponsored 12 travel stipends for students to attend the conference and present their research. CIE hopes that these students will return in subsequent years to present their results in the form of research papers.

The posters addresses current research in the Computers and Information in Engineering community, either through development of new software, application and evaluation of software, or empirical studies of engineering software.

See page 121 for a list of presentations.

Workshops and Tutorials are available to all registered attendees. The fee associated with each session is $25 unless noted otherwise.

W1: TOPOLOGY OPTIMIZATION THROUGH EXAMPLES AND CASE STUDIES

Sunday, August 6
9:00am–4:00pm
Room 14

Organizer: **Krishnan Suresh,** *University of Wisconsin*

Abstract: The objective of this workshop is to expose the audience to cutting-edge topology optimization techniques. Strategies for posing and solving multi-load, multi-body topology optimization problems will be presented. Recent developments in integrating topology optimization and additive manufacturing will also be discussed.

W2: DESIGN WHODUNIT: THE WHO, WHAT, AND HOW OF EFFECTIVE DESIGN TEAMS

Sunday, August 6
9:00am–12:00pm
Room 20

Organizers/Presenters: **Kathryn W. Jablokow,**
Pennsylvania State University
Neeraj Sonalkar, *Stanford University*

Abstract: In both industry and academia, engineering design is a “team sport” that relies on the successful coordination and collaboration of multiple players to solve complex open-ended problems. What makes some design teams “click” and flourish, while other teams flounder and fail? In this interactive workshop, we will present fundamental principles for developing effective design teams and practice new tools that address “who” is on the team, “how” they interact, and “what” they produce. In particular, participants will explore the following research-based principles and tools for developing effective design teams:

- Bridging cognitive gaps – Tool: Kirton’s Adaption-Innovation Inventory (KAI)
- Tracking team interactions – Tool: Interaction Dynamics Notation (IDN)
- Building shared mental models – Tool: The Idea Mapping Board (IMB)

These principles and tools are part of a new framework for modeling and creating High Performance Design Teams developed by Stanford and Penn State engineering educators with support from the National Science Foundation. The latest research findings based on this framework will also be shared with workshop participants.

W3: CLOUD BASED DESIGN AND INTEGRATED FINITE ELEMENT ANALYSIS

Sunday, August 6
9:00am–12:00pm
Room 24

Organizers/Presenters: **Ashok V. Kumar,** *University of Florida, Gainesville*
Darren Henry, *Onshape*

Abstract: Recent advances towards full-cloud CAD and integrated finite element analysis will be presented at this workshop. Integrating CAD and finite element analysis has been difficult using traditional finite element method due to the challenges of translating complex geometry into a finite element mesh in a fully automated fashion. In this workshop, we will introduce mesh independent finite element analysis based on an immersed boundary approach that allows accurate CAD models to be used without any modification for analysis. Geometry is immersed in an automatically generated background mesh and used for analysis without any loss in geometric accuracy or the need to recreate the solid model as a mesh. This approach also enables the use of B-spline elements that provide continuous solutions for stresses and strains. In addition to demonstrating this technology using commercial cloud based CAD software, we will provide a tutorial on the underlying methodology and its application to various types of analysis including static and dynamic structural analysis as well as thermal analysis and coupled simulations.

W4: LAB EXPERIMENTS ON INDIVIDUAL AND INTERACTIVE DECISION MAKING IN DESIGN

Sunday, August 6
8:00am–12:00pm
Room: To Be Determined
Room 21

Organizers/Presenters: **Zhenghui Sha,** *University of Arkansas*
Jitesh H. Panchal, *Purdue University*
Ilias Bilionis, *Purdue University*

Abstract: Decision-making is at the core of engineering design. While there has been significant progress in using normative theories to support design decision making, the use of experimental methods for decision making in design is relatively recent. The goal of this workshop is to provide a platform for discussion of the state-of-the-art research of human-subject experiments on understanding individual as well as the interactive decision-making in engineering design. The workshop has four learning objectives: a) understanding the benefits and challenges in using controlled lab experiments in design research, b) understanding the process of designing lab experiments with human subjects, c) learning statistical techniques for analyzing behavioral data, and d) gaining familiarity with modern software platforms for conducting lab experiments in interactive decision making. The workshop will consist of a set of presentations related to the learning objectives, followed by a hands-on experimental study.

W5: THE PSI MATRIX FRAMEWORK OF DESIGN

<< CANCELLED >>

Organizers/Presenters: **Yoram Reich,** *Tel Aviv University*
Eswaran Subrahmanian, *Carnegie Mellon University*

Abstract: The PSI matrix is a framework for understanding complex design situations and improving their outcome. The framework is a culmination of 3 decades of research on design originated at the Engineering Design Research Center at Carnegie Mellon University and continuing in three continents with numerous people. It has guided us in projects and continues to be developed and serve as a method we use in our projects. The framework has been presented in conferences and workshops in the last 5 years and reported in papers; its latest version will be presented at the workshop. The framework is composed of 3 similar levels addressing what/why of the problem being addressed, who is addressing it and how. The framework allows understanding several aspects that influence the success or failure of projects and their critical interrelationships.

The workshop will provide an introduction to the framework through simple exercises. Subsequently, more complex cases will be analyzed and at the end, the participants, divided in small groups will analyze a case, identify its problematic aspects, and propose solutions. The outcome of these group discussions will be presented at the workshop. The workshop provides a new language to speak about complex situations that is intuitive and powerful.

W6: USING CYBERLEARNING TO ENABLE SUSTAINABLE ENGINEERING EDUCATION

<< CANCELLED >>

Organizers/Presenters: **Karl R. Haapala,** *Oregon State University*
Kathy L. Jackson, *Pennsylvania State University*
Kyoung-Yun Kim, *Wayne State University*
Gul E. Okudan Kremer, *Iowa State University*
Carolyn E. Psenka, *Wayne State University*
Kamyar Raoufi, *Oregon State University*
Kijung Park, *Pennsylvania State University*

Abstract: Engineering educators have few tools at their disposal to facilitate effective learning of the broad topics encompassed by sustainable engineering. Sustainable engineering tools are either limited in scope or require costly licenses and/or specialized domain knowledge. Thus, open cyberlearning tools, such as the CooL:SLiCE platform introduced in this workshop, provide the opportunity to scaffold the learning of topics related to design, manufacturing and supply chain analysis, and environmental responsibility – all pertinent to sustainable product development. Using active participation, this workshop will examine the current state of sustainable engineering education and will introduce the CooL:SLiCE platform. Participants will envision new approaches to educating engineering students about sustainability topics in formal and informal

settings. These approaches may make use of CooL:SLiCE and/or other cyberlearning tools using a constructionist learning approach to supplement conventional engineering education. Participants will work in groups to develop plans for implementing these approaches in their own settings. Participants are recommended to bring a laptop with an internet connection for the working sessions.

W7: LIGHTWEIGHTING TECHNOLOGIES - DESIGN WITH ALUMINUM

<< CANCELLED >>

Organizer/Presenter: **Raghu Echempati,** *Kettering University*

Abstract: The workshop focuses on the teaching and learning (T&L) of lightweight technologies using non-ferrous materials such as aluminum and other non-metals. Basic mechanical and material properties, manufacturing processes, design aspects and design guidelines along with several real life examples and applications of aluminum alloy materials commonly used in automotive and other applications will be discussed. The workshop is suitable for audience with associate degree, 4-year engineering degree or to postgraduate students and practicing engineers. Tips to faculty interested in developing a course on this theme will be provided. Also, tips for using 'Blended learning'/'Flipped class room' will be provided and discussed. Finally, assessment tools such as homeworks, exams and final project will be presented and discussed.

W8: SUCCESS AS A STUDENT RESEARCHER: MAXIMIZING YOUR PRODUCTIVITY AND EFFICIENCY

Sunday, August 6
1:00pm–5:00pm
Room 15

***Students Only – No Charge**

Organizers/Presenters: **Scott Ferguson,** *North Carolina State University*
Bryony DuPont, *Oregon State University*

Abstract: The objective of this workshop is to create a forum for students attending the IDETC/CIE conferences to learn about and discuss research practices that maximize productivity and research efficiency. Faculty and Ph.D. students from the design community will present best practices and ways to identify/avoid the common pitfalls that students face. Topics will range from research skills (e.g., how to conduct a literature review, how to develop a research plan) to social skills (how to work with your lab-mates, how to build research networks). Discussion will take place via presentations and open question/discussion periods. It is expected that student attendees will also have opportunities to build cross-university relationships and ramp up their excitement for the conference.

W9: EFFECTIVE TECHNICAL COMMUNICATION: THE ASSERTION-EVIDENCE APPROACH

****Pre-Registration / Approval is required to participate in this workshop.**

Sunday, August 6
1:00pm–6:00pm
Room 16

Organizer/Presenter: **Michael Alley,** *Pennsylvania State University*

Abstract: The goal of the workshop on Effective Communication: The Assertion-Evidence Approach is to provide a professional development experience and opportunity for community and networking within the Design Engineering Division (DED) of ASME that supports and mentors underrepresented groups. The workshop is designed to provide graduate students and faculty members with professional development activities and to give them the opportunity to make connections with an international network of supportive researchers in their field. In addition to skill development, this workshop will support the development of a network of people within the community from underrepresented groups and others who are interested in supporting the inclusion and growth of underrepresented groups within ASME DED and their success. This workshop will be the eighth annual workshop event of the Broadening Participation Committee of the ASME DED.

From an audience's perspective, many presentations in science and engineering suffer because the talks are unfocused. This lack of focus leads to much noise, which reduces the understanding by the audience. Much of the problem arises from speakers following PowerPoint's defaults and building their talks on phrase headlines supported by bulleted lists. This workshop presents the assertion-evidence approach (http://www.assertion-evidence.com) to designing scientific presentations. In this approach, the speaker builds the talk on key messages supported by visual evidence. Our research has found that assertion-evidence talks are more focused and much better understood by audiences. In addition, our students (even those initially nervous about making presentations) report that using the assertion-evidence approach has given them more confidence. To this workshop, participants are encouraged to bring a laptop and to create a couple of slides beforehand for their research using the following tutorial: http://www.assertion-evidence.com/tutorial.html.

Participants will also receive a free copy of the book: The Craft of Scientific Presentations by Michael Alley: http://www.craftofscientificpresentations.com

T1: MODELING NONLINEAR DEFLECTIONS IN COMPLIANT MECHANISMS

Sunday, August 6
1:00pm–4:00pm
Room 13

Organizer/Presenter: **Guimin Chen,** *Brigham Young University*

Abstract: After reviewing the fundamental beam theories, this tutorial will discuss major challenges in modeling nonlinear deflections in compliant mechanisms, recently developed methods and their use for kinetostatic modeling of compliant mechanisms.

T2: ACTIVE DISTURBANCE REJECTION CONTROL: AN EMERGING INDUSTRIAL CONTROL TECHNOLOGY

Sunday, August 6
1:00pm–5:00pm
Room 19

Organizer/Presenter: **Zhiqiang Gao,** *Cleveland State University*

Abstract: In control theory, disturbance rejection is one of many competing control design objectives, including command following, robust stability, noise sensitivity, etc.; in practice, however, it is often THE design objective that is front and center in the mind of design engineers. This workshop provides an opportunity for students, researchers and practitioners to see how the control problems in a particular domain of applications are reduced to their essence, i.e. disturbance rejection, and what tools are available at our disposal to solve these problems. Through the exposition of the basic design principles and how they are applied in the context of engineering problem-solving, this workshop provides the audience with a comprehensive understanding of Active Disturbance Rejection Control (ADRC). The short simulation code will enable the participants to quickly test the idea of ADRC and to make seamless the integration of ADRC with the domain knowledge and skills of a particular engineering branch. It is through such integration that users of ADRC, most likely the practicing engineers and applied researchers, will be able to take advantage of it freely in solving the pressing problems of today.

T3: NEW VALUE CREATION THROUGH EMOTIONAL ENGINEERING

Sunday, August 6
1:00pm–5:00pm
Room 20

Organizer: **Shuichi Fukuda,** *Keio University*

Abstract: The goal of this tutorial is to share the basic idea how important it is to pay attention to the psychological needs of our customers. In fact, diversification and personalization come from their expectations to satisfy their intrinsic motivations and their needs to grow. Emotion is, as their etymologies indicate, very closely associated with motivation. One of the imminent issues of engineering is how we can explore new markets. We have been trying to explore new markets by providing products with better quality or with new functions. But product quality is almost saturating and it becomes increasingly difficult for customers to recognize how much improved their product quality is. And most of new functions are invented from producer's perspective. But psychology teaches us that people are much more satisfied if things meet their intrinsic motivations. We have been trying to meet their expectations, based on extrinsic motivation, i.e., as rewards or as products. But if we pay more attention to their intrinsic needs, we can satisfy our customers more with less time and efforts. We should pay more attention to process values and we should consider how we can get our customers involved in product development.

T4: DESIGN OF MULTIBODY LEGGED ROBOTS

Sunday, August 6
8:00am–12:00pm
Room 13

Organizers/Presenters: **Ferdinando Cannella,** *Italian Institute of Technology*
Giovanni Gerardo Muscolo, *Italian Institute of Technology*
Mariapaola D'Imperio, *Italian Institute of Technology*

Abstract: The Tutorial aims at giving the attendees; a practical knowledge on modelling legged robots. Nowadays: bipeds, quadrupeds, hexapods, etc. are quickly becoming an important part of the mobile mechanisms, then it is important to have the basics in their modelling.

T5: DESIGN AND FABRICATION OF DNA ORIGAMI MECHANISMS

Sunday, August 6
1:00pm–4:00pm
Room 21

Organizers/Presenters: **Haijun Su,** *The Ohio State University*
Carolos Castro, *The Ohio State University*

Abstract: DNA origami nanotechnology is a recently developed self-assembly process for design and fabrication of complex 3D nanostructures using DNA as a functional material. This tutorial covers some recent progress in applying DNA origami to design kinematic mechanisms at the nanometer scale. These nanomechanisms, which we call DNA Origami Mechanisms (DOM), are made by integrating relatively stiff bundles of double-stranded DNA (dsDNA), which function as rigid links, connected by highly compliant single-stranded DNA (ssDNA) strands arranged strategically to function as kinematic joints. The designs of kinematic joints including revolute, prismatic, cylindrical, universal and spherical are presented. The steps as well as the necessary software and experimental methods for designing DOM with DNA origami links and joints are detailed. To demonstrate the designs, we presented the designs of Bennett four-bar and crank-slider linkages. These nanomechanisms can be a central part of nanorobots for applications such as targeted drug delivery, biosensing, and nanomanucturing. We will also present a list of technical challenges and on-going efforts such as design automation and computational modeling. These challenges could also be opportunities for mechanism and robotics community to apply well-developed kinematic theories and computational tools to the design of DNA-based nanorobots and nanomachines.

T6: FRACTIONAL ORDER MECHANICS – AN INTRODUCTION

<< CANCELLED >>

Organizer/Presenter: **YangQuan Chen,** *University of California, Merced*

Abstract: This tutorial will give an introduction of a new emerging field of study known as “fractional order mechanics (FOMech).” Fractional calculus is about differentiation or integration of noninteger order. Traditional calculus uses integer order differentiation or integration. As mechanics goes into micro and nano world, more and more “anomalous” behaviors are being observed in materials such as porous medias, particulate systems, soft matters etc. The inherent nature of memory, or hereditary, or long range dependence, or long range interactions in the mechanic systems at the smaller scale prompts us to take a look of the modeling tools we are using. It turns out that, using integer order calculus based tools may limit our insight into the mechanical behaviors at all micro, meso, and macro scales. This workshop will focus on introducing “fractional order mechanics (FOMech)” by covering 1) Motivations and real world needs; 2) Mathematical foundations; 3) Fractional mechanics in classical sense (Bagley-Torvik) (3) Fractional Euler Lagrange mechanics; 4) Fractional variational principle.

T7: INDUSTRY ONTOLOGY FOUNDRY: A STRATEGY FOR PROMOTING DATA INTEROPERABILITY ACROSS THE ENTERPRISE

Sunday, August 6
1:00pm–5:00pm
Room 24

Organizers/Presenters: **Kemper Lewis,** *University at Buffalo*
Barry Smith, *University at Buffalo*
Ram Sriram, *National Institute of Standards and Technology (NIST)*
Dimitris Kiritsis, Ecole Polytechnique Federale de Lausanne
Ian Grosse, *University of Massachusetts, Amherst*

Abstract: The workshop will provide an overview of different aspects of the Industry Ontology Foundry (IOF). IOF is an initiative involving academic and industrial partners in a collaboration managed by NIST to create a suite of interoperable, public, domain-ontology modules extending across major areas of digital manufacturing. Modules under consideration/development include: Product Life Cycle, Core Product Model, Functional Basis, Materials and Material Attributes. In addition the IOF community is considering Basic Formal Ontology (BFO) as a unifying top-level ontology, and the workshop will include an introduction to the use of BFO in ontology alignment together with a series of presentations outlining the goals and initial test modules of the Foundry. Opportunities for interaction will be provided at every stage in the agenda.

ASME SOCIETY LEVEL AWARDS

S.V. Sreenivasan

The University of Texas at Austin

MACHINE DESIGN AWARD

Recognizes eminent achievement or distinguished service in the field of machine design which is considered to include application, research, development, or teaching of machine design.

❖ ❖ ❖

Kon-Well Wang

University of Michigan - Ann Arbor

J.P. DEN HARTOG AWARD

Recognizes lifetime contributions to the teaching and practice of vibration engineering.

❖ ❖ ❖

Gul E. Okudan Kremer

Iowa State University

ASME RUTH AND JOEL SPIRA OUTSTANDING DESIGN EDUCATOR AWARD

Recognizes a person who exemplifies the best in furthering engineering design education through vision, interactions with students and industry, scholarship and impact on the next generation of engineers, and a person whose action serves as a role model for other educators to emulate.

❖ ❖ ❖

Saeed David Barbat

Ford Motor Company

BARNETT UZGIRIS PRODUCT SAFETY AWARD

Recognizes individuals who have made significant contributions to the safe design of products through teaching, research, and professional accomplishments.

❖ ❖ ❖

COMPUTERS AND INFORMATION IN ENGINEERING DIVISION

Zhenghui Sha

Purdue University

BEST PH.D. THESIS / DISSERTATION

Recognizes a promising young investigator who authored the best Ph.D thesis of the year in the area of computers and information in engineering.

❖ ❖ ❖

Rahul Rai

University of Buffalo – SUNY

YOUNG ENGINEER AWARD

Recognizes a promising young investigator who is making outstanding contributions to the progress in the application of computers in engineering.

❖ ❖ ❖

Monica Bordegoni

Politecnico di Milano

DISTINGUISHED SERVICE AWARD

Recognizes a person for dedicated service in support of the CIE Division's mission.

❖ ❖ ❖

Krishnan Suresh

University of Wisconsin, Madison

DISTINGUISHED SERVICE AWARD

Recognizes a person for dedicated service in support of the CIE Division's mission.

❖ ❖ ❖

Giandomenico Caruso, Daniele Ruscio, Dedy Ariansyah, and Monica Bordegoni

BEST PAPER AWARD

IDTEC2017-67850: Driving Simulator System To Evaluate Driver's Workload Using ADAS In Different Driving Contexts

❖ ❖ ❖

Carlos Morato, Krishna Kaipa, and Satyandra Gupta

CAPPD TECHNICAL COMMITTEE BEST PAPER AWARD

IDETC2017-68269: System State Monitoring to Facilitate Safe and Efficient Human-Robot Collaboration in Hybrid Assembly Cells

❖ ❖ ❖

John Michopoulos, Athanasios Iliopoulos, John Steuben, and Virginia Degiorgi

AMS TECHNICAL COMMITTEE BEST PAPER AWARD

IDETC2017-67811: Towards an Analytical, Computational and Experimental Framework for Predicting Aging of Cathodic Surfaces

❖ ❖ ❖

Farhad Ameri and Ramin Sabbagh

SEIKM Technical Committee BEST PAPER AWARD

IDETC2017-67652: A Thesaurus-Guided Text Analytics Technique for Capability-Based Classification of Manufacturing Suppliers

❖ ❖ ❖

Doris Aschenbrenner, Nicolas Maltry, Klaus Schilling, and Jouke Verlinden

VES Technical Committee BEST PAPER AWARD

IDETC2017-67790: An Exploration Study for Augmented and Virtual Reality Enhancing Situation Awareness for Plant Teleanalysis

❖ ❖ ❖

DESIGN ENGINEERING DIVISION

Vijay Kumar

University of Pennsylvania

ROBERT ABBOTT AWARD

For valued services on behalf of the Division, the Society, and the Engineering Profession. A Lifetime Service Award to recognize a Society Member or Staff Member who has served the Division beyond the call of duty.

❖ ❖ ❖

Lei Zuo

Virginia Tech.

LEONARDO DA VINCI AWARD

For eminent achievement in the design or invention of a product which is universally recognized as an important advance in machine design.

❖ ❖ ❖

Shrinath Deshpande and Anurag Purwar

Stony Brook University

A. T. YANG MEMORIAL AWARD IN THEORETICAL KINEMATICS

Recognizes the authors, of the best theoretical kinematics paper at the Mechanisms & Robotics Conference.

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Guangbo Hao

University College Cork

COMPLIANT MECHANISMS APPLICATION AWARD

For contribution to the state of the art in compliant mechanism theory or application.

❖ ❖ ❖

Ali Hatamizadeh, Yuanping Song and Jonathan B. Hopkins

University of California, Los Angeles

COMPLIANT MECHANISMS THEORY AWARD

For contribution to the state of the art in compliant mechanism theory or application.

❖ ❖ ❖

Kemper Lewis

University at Buffalo

DESIGN AUTOMATION AWARD

Recognizes sustained meritorious contribution to research in Design Automation

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Alice M. Agogino

University of California at Berkeley

DESIGN THEORY METHODOLOGY AWARD

Recognizes sustained and meritorious contributions to research; education; service; training of researchers or practitioners; overall leadership in advancing the field of Design Theory and Methodology.

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Sreekalyan Patiballa and Girish Krishnan

University of Illinois, Urbana Champaign

FREUDENSTEIN YOUNG INVESTIGATOR AWARD

Recognizes a paper that makes a significant original contribution to the theory or practice of mechanisms and has the potential to enhance the public good.

❖ ❖ ❖

Peter Sandborn

University of Maryland, College Park

KOS ISHII-TOSHIBA AWARD

For sustained and meritorious contributions to design for manufacturing and the life cycle.

❖ ❖ ❖

Giuseppe Rega

Sapienza University of Rome

LYAPUNOV AWARD

For life long contributions to the field of nonlinear dynamics.

❖ ❖ ❖

Alper Erturk

Georgia Institute of Technology

C. D. MOTE JR., EARLY CAREER AWARD

Presented to an early-career recipient who demonstrates research excellence in the field of vibration and acoustics.

❖ ❖ ❖

I. Y. (Steve) Shen

University of Washington Seattle

N. O. MYKLESTAD AWARD

In recognition of a major innovative contribution to vibration engineering.

❖ ❖ ❖

Vladimir V. Vantsevich

The University of Alabama at Birmingham

THAR ENERGY DESIGN AWARD

The Award recognizes individuals who have made significant contributions to the design research, innovation and product design in the areas related to energy engineering.

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AVT TECHNICAL COMMITTEE BEST PAPER AWARD

Frederico Ballo, Giorgio Previati, Massimiliano Gobbi and Gianpiero Mastinu

A Semi-*Analytical Tire Model for the Study of Tire/Rim Interaction on a Road Vehicle*

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AVT TECHNICAL COMMITTEE BEST STUDENT PAPER AWARD

Alberto Doria, Cristian Mede, Daniele Desideri, Alvise Maschio, and Frederico Moro

Improvement of Harvesters for Tires by Means of Multi-Physics Simulation

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DAC TECHNICAL COMMITTEE BEST PAPER AWARD

Connor Sharpe, Clinton Morris, Benjamin Goldsberry, Carolyn Conner Seepersad, and Michael R. Haberman

Bayesian Network Structure Optimization for Improved Design Space Mapping for Design Exploration with Materials Design Applications

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DEC TECHNICAL COMMITTEE BEST PAPER AWARD

Sunghoon Lim, Kathryn Jablokow, and Conrad S. Tucker

Quantifying the Mismatch between Course Content and Students Dialogue in Online Learning Environments

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DFMLC TECHNICAL COMMITTEE BEST PAPER AWARD

Ardeshir Raihanian Mashhadi and Sara Behdad

Demystifying the Relationship between Use-Phase Attributes and Energy Consumption: A Case Study of Personal Computers

❖ ❖ ❖

DTM TECHNICAL COMMITTEE BEST PAPER AWARD

Guanglu Zhang, Daniel McAdams, Milad Mohammadi Darani, and Venkatesh Shankar

Product Performance Evolution Prediction by Lotka-Volterra Equations

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DTM TECHNICAL COMMITTEE BEST PAPER AWARD

Ching-Wen Li and Gou-Jen Wang

Double-Layer Nerve Guide Conduit with Palisade Poly(lactic-co-glycolic acid) Tube Wrapped by Microporous Chitosan–Collagen Composite

❖ ❖ ❖

DTM Technical Committee BEST PAPER AWARD

Lior Medina, Rivka Gilat, and Slava Krylov

On The Usage of Berger's Model for Electrostatically Actuated Circular Curved

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MNS TECHNICAL COMMITTEE BEST PAPER AWARD

Sherif Tella, Nouha Alcheikh, and Mohammad Younis

Electrothermally Actuated Microbeams with Varying Stiffness

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MR TECHNICAL COMMITTEE BEST PAPER AWARD

Robert J. Lang and Larry Howell

Rigidly Foldable Quadrilateral Meshes from Angle Arrays

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VIB TECHNICAL COMMITTEE BEST STUDENT PAPER AWARD

David Tan and Alper Erturk

On The Origin Of The Nonclassical Softening Nonlinearity In Mems/Nems Cantilevers

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VIB TECHNICAL COMMITTEE BEST STUDENT PAPER AWARD

J. Justin Wilbanks and Michael J. Leamy

Uncertain Parameter Estimation Approaches for Increasing the Effectiveness of Command-Shaped Engine Restart Strategies

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VIB TECHNICAL COMMITTEE BEST STUDENT PAPER AWARD

Kai Wu and Weidong Zhu

A New Global Spatial Discretization Method for Two-Dimensional Continuous Systems

	TIME	ROOM
SUNDAY, AUGUST 6, 2017		
Design Engineering Division Executive Committee Meeting	**3:00pm–9:00pm**	**Room 12**
MONDAY, AUGUST 7, 2017		
DED – Vehicle Design (AVT)	12:00pm–1:00pm	Room 17
DED – Power Transmission and Gearing (PTG)	4:00pm–5:30pm	Room 16
TUESDAY, AUGUST 8, 2017		
CIE Division – General Meeting	**7:45pm–8:45pm**	**Room 3**
CIE – Advanced Modeling & Simulation (AMS)	6:30pm–7:30pm	Room 4
CIE – Computer-Aided Product and Process Development (CAPPD)	6:30pm–7:30pm	Room 3
CIE – Systems Engineering, Info. & Knowledge Management (SEIKM)	6:30pm–7:30pm	Room 5
CIE – Virtual Environments and Systems (VES)	6:30pm–7:30pm	Room 2
Design Engineering Division General Committee Meeting	**2:00pm–5:00 pm**	**Room 17**
DED – Design Automation (DAC)	6:30pm–8:00pm	Room 7
DED – Design Education (DEC)	4:00pm–5:40pm	Room 23
DED – Design for Manufacturing and the Life Cycle (DFMLC)	4:00pm–5:40pm	Room 22
DED – Design Theory and Methodology (DTM)	6:00pm–7:30pm	Room 21
DED – Mechatronic & Embedded Systems & Applications (MESA)	4:00pm–5:40pm	Room 19
DED – Mechanisms and Robotics (MR)	7:00pm–9:00pm	Room 11
DED – Micro & Nanosystems (MNS)	5:40pm–7:00pm	Room 14
DED – Multibody Systems & Nonlinear Dynamics (MSNDC)	6:00pm–8:00pm	Room 26B
DED – Vibration and Sound (TCVS)	6:00pm–8:30pm	Room 26C
DED Research Committee on the Mechanics of Jointed Structures	4:00pm – 5:30pm	Room 26C
WEDNESDAY, AUGUST 9, 2017		
Industry Academic Relations Subcommittee Meeting	11:40am–1:15pm	Room 17

As we strive to continue cross collaboration amongst multiple technical areas, this year's organizers have created sessions that offer a more diverse agenda and may easily be attractive to attendees within varying disciplines. Below is a listing of the specific sessions that include the above mentioned collaboration:

CIE-29	DAC-8
DAC-8	CIE-29
MNS-2	VIB-12
MNS-4	MR-5
MNS-8-1	VIB-12
MR-5	MNS-4
MR-6	MSNDC-16
MSNDC-10	VIB-10
MSNDC-14	VIB-17
MSNDC-16	MR-6
MSNDC-2	VIB-3
MSNDC-4	VIB-6
MSNDC-5	VIB-4
MSNDC-6	VIB-16
MSNDC-7	VIB-8
MSNDC-9	VIB-14
VIB-10	MSNDC-10
VIB-12	MNS-2
VIB-12	MNS-8-1
VIB-14	MSNDC-9
VIB-16	MSNDC-6
VIB-17	MSNDC-14
VIB-3	MSNDC-2
VIB-4	MSNDC-5
VIB-6	MSNDC-4
VIB-8	MSNDC-7

TECHNICAL SESSIONS AT-A-GLANCE

— MONDAY —

Room	8:00am – 9:00am	9:10am – 10:50am	11:00am – 12:00pm	2:00pm – 3:40pm	4:00pm – 5:40pm
Room 1 *Concourse Level*		DAC-20-1 *	CIE-34-1 *	EGD *	
Room 3 *Concourse Level*	CIE-1-1			CIE-28-1 *	CIE-1-2
Room 4 *Concourse Level*		CIE-27-1 *		CIE-8-1	CIE-8-2
Room 5 *Concourse Level*	CIE-21-1	CIE-22-1		CIE-22-2	CIE-17-1
Room 6 *Concourse Level*			DAC-11-1	DAC-1-1	DAC-3-1
Room 7 *Concourse Level*			DAC-8-1	DAC-8-2	DAC-19-1
Room 8 *Exhibit Level*			DAC-13-1	DAC-10-1	DAC-17-1
Room 9 *Exhibit Level*	MR-4-1 *	MR-4-2		MR-4-3	MR-4-4
Room 10 *Exhibit Level*	MR-1-1	MR-1-2		MR-1-3	MR-1-4
Room 11 *Exhibit Level*	MR-8-1	MR-8-2		MR-8-3	MR-8-4
Room 12 *Exhibit Level*					
Room 13 *Exhibit Level*	MNS-5-1	MNS-5-2	MNS-1-1 *	MNS-6-1	MNS-6-2
Room 14 *Exhibit Level*		MESA-6-1		MESA-1-1	MESA-6-2
Room 15 *Exhibit Level*	PTG-3-1	PTG-3-2		PTG-3-3	
Room 16 *Exhibit Level*	PTG-1-1	PTG-1-2	PTG-9-1 *	PTG-1-3	
Room 19 *Exhibit Level*	MESA-19-1	MESA-14-1	MESA-23-1 *	MESA-15-1	MESA-22-1
Room 20 *Exhibit Level*	DTM-1-1		DTM-11-1	DTM-5-1	DTM-3-1
Room 21 *Exhibit Level*	BIOMED-1-2	BIOMED-1-1	BIOMED-2-1	BIOMED-2-2	
Room 22 *Exhibit Level*	DFMLC-11-1	DFMLC-2-1	DFMLC-1-1 *	DFMLC-13-1 *	DFMLC-2-2
Room 23 *Exhibit Level*		DEC-1-1	DEC-5-1 *	DEC-4-1	DEC-4-2 *
Room 24 *Exhibit Level*		AVT-1-1	AVT-1-3 *	AVT-1-2	AVT-3-1
Room 25A *Ballroom Level*	VIB-2-1		VIB-2-2	VIB-2-3	MSNDC-11-1
Room 25B *Ballroom Level*	MR-11-1	MR-11-2	VIB-9-1	MSNDC-5-1	MSNDC-5-2
Room 25C *Ballroom Level*	VIB-15-4		MSNDC-4-1	VIB-15-1	VIB-6-1
Room 26A *Ballroom Level*		VIB-1-1 *	MR-9-1 *	VIB-10-1	MSNDC-10-1
Room 26B *Ballroom Level*	MSNDC-2-1	MSNDC-18-1	MSNDC-2-2	VIB-3-1	VIB-3-2
Room 26C *Ballroom Level*	MSNDC-6-1		VIB-16-1	MSNDC-6-2	MSNDC-19-1

MONDAY, AUGUST 7, 2017

CIE-1-1: AMS GENERAL I

CONCOURSE LEVEL, ROOM 3 **8:00AM–9:00AM**

Session Organizer: **John Oliva,** *Dow Performance Silicones, Midland, MI, USA*

HYPERELASTIC MATERIAL MODEL SELECTION OF STRUCTURAL SILICONE SEALANTS FOR USE IN FINITE ELEMENT MODELING
Technical Paper Publication. DETC2017-67589

John Oliva, Larry Carbary, *Dow Performance Silicones, Midland, MI, USA,* ***Jon Kimberlain,*** *Dow Performance Silicones, Elizabeth-town, KY, USA*

AUTOMATED QUANTITATIVE ANALYSIS OF TERMINAL TREE BRANCH SIMILARITY BY 3D REGISTRATION
Technical Paper Publication. DETC2017-67831

Joseph Brucculeri, Lance Evans, *Manhattan College, Riverdale, NY, USA,* ***Zahra Shahbazi,*** *Manhattan College, Stamford, CT, USA*

CFD STUDY OF AN AUTONOMOUS SUBMARINE IN EXTRATERRESTRIAL SEAS
Technical Paper Publication. DETC2017-67593

Shane Carberry Mogan, Pawel Sawicki, Cyril J. Bernardo, Damon Chen, Iskender Sahin, *New York University, Brooklyn, NY, USA,* ***Jason Hartwig,*** *NASA Glenn Research Center, Cleveland, OH, USA,* ***Angelantonio Tafuni,*** *New York University, Brooklyn, NY, USA*

CIE-21-1: VES I

CONCOURSE LEVEL, ROOM 5 **8:00AM–9:00AM**

Session Organizer: **Sascha Brandt,** *Heinz Nixdorf Institute, Paderborn University, Paderborn, North Rhine-Westphalia, Germany*

Session Co-Organizer: **Robert E. Wendrich,** *IDE at University of Twente, Enschede, Netherlands*

EXAMINING THE FIDELITY OF ON-THE-FLY ASSEMBLY INSPECTION WITH A LOW-COST RGB-D CAMERA
Technical Paper Publication. DETC2017-68231

Rafael Radkowski, Jarid Ingebrand, *Iowa State University, Ames, IA, USA*

AUTOMATIC DERIVATION OF GEOMETRIC PROPERTIES OF COMPONENTS FROM 3D POLYGON MODELS
Technical Paper Publication. DETC2017-67528

Sascha Brandt, Claudius Jähn, Matthias Fischer, Maria Gerges, *Heinz Nixdorf Institute, Paderborn University, Paderborn, North Rhine-Westphalia, Germany,* ***Jan Berssenbrügge,*** *Fraunhofer-Institut für Entwurfstechnik Mechatronik IEM, Paderborn, Germany*

A VIRTUAL CMM INSPECTION TOOL FOR CAPTURING PLANNING STRATEGIES
Technical Paper Publication. DETC2017-67519

Dimitrios Anagnostakis, James Ritchie, *Heriot-Watt University, Edinburgh, Scotland, United Kingdom,* ***Theo Lim,*** *Heriot-watt University, Edinburgh, Scotland,* ***Raymond Sung, Richard Dewar,*** *Renishaw plc, Edinburgh, United Kingdom*

DFMLC-11-1: ENGINEERING FOR GLOBAL DEVELOPMENT

EXHIBIT HALL LEVEL, ROOM 22 **8:00AM–9:00AM**

Session Organizer: **Cassandra Telenko,** *Georgia Institute of Technology, Georgia, GA, USA*

Session Co-Organizer: **Ashwani Gupta,** *University of Maryland, MD, USA*

DESIGN OF AN INTEGRATED COTTON PICKING SYSTEM FOR SMALL-SCALE INDIAN AGRICULTURE
Technical Paper Publication. DETC2017-68132

Brittany N. Bautista, Guillermo F. Diaz Lankenau, Steven P. Guitron, Brandon D. Jennings, Rahul Nechlani, Astera S. Tang, Matthew R. Tucker, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Amos Winter,*** *MIT, Cambridge, MA, USA*

ANALYSIS OF A SIMPLIFIED BLADE DESIGN TO FACILITATE WIND ENERGY PENETRATION IN THE DEVELOPING WORLD
Technical Paper Publication. DETC2017-68411

Hamid Khakpour Nejadkhaki, Yi-Meng Sylvia Hu, Michelle Durrnagel, Moritz Lippert, Thanh Danh Anthony Ngo, John Hall, *University at Buffalo, Buffalo, NY, USA*

INFLUENCE OF DISTRIBUTED REACTION REGIME ON FUEL REFORMING
Technical Paper Publication. DETC2017-68129

Richard Scenna, *DOD, Aberdeen Proving Ground, MD, USA,* ***Ashwani Gupta,*** *University of Maryland, Maryland, MD, USA*

DTM-1-1: CREATIVITY IDEATION I

EXHIBIT HALL LEVEL, ROOM 20 **8:00AM–9:00AM**

Session Organizer: **Barry Kudrowitz,** *University of Minnesota, Minneapolis, MN, USA*

Session Co-Organizer: **L. H. Shu,** *University of Toronto, Toronto, ON, Canada*

DIVERGENT THINKING ABILITY + INTEREST = CREATIVE IDEAS: EXPLORING THE RELATIONSHIPS BETWEEN COGNITIVE CREATIVITY ASSESSMENTS AND PRODUCT DESIGN IDEA GENERATION
Technical Paper Publication. DETC2017-67261

Jieun Kwon, Luke Bromback, Barry Kudrowitz, *University of Minnesota, Minneapolis, MN, USA*

A COMPARISON OF VARIETY METRICS IN ENGINEERING DESIGN
Technical Paper Publication. DETC2017-67502

Daniel Henderson, Kevin Helm, *Penn State University, University Park, PA, USA,* ***Kathryn Jablokow,*** *Penn State University, Malvern, PA, USA,* ***Seda McKilligan,*** *Iowa State University, Ames, IA, USA,* ***Shanna Daly,*** *University of Michigan, Ann Arbor, MI, USA,* ***Eli Silk,*** *Rutgers University, New Brunswick, NJ, USA*

OBJECT REORIENTATION AND CREATIVE PERFORMANCE
Technical Paper Publication. DETC2017-67513

Ana-Maria Olteteanu, *Bremen Spatial Cognition Center, Bremen, Germany,* ***L.H. Shu,*** *University of Toronto, Toronto, ON, Canada*

MR-1-1: PARALLEL SYSTEMS I

EXHIBIT HALL LEVEL, ROOM 10 **8:00AM–9:00AM**

Session Organizer: **Anurag Purwar,** *Stony Brook University, Stony Brook, NY, USA*

Session Co-Organizer: **Kwun-Lon Ting,** *Tennessee Technological University, Cookeville, TN, USA*

KINEMATICS, WORKSPACE AND SINGULARITY ANALYSIS OF A MULTI-MODE PARALLEL ROBOT
Technical Paper Publication. DETC2017-67284

Damien Chablat, *CNRS/LS2N, Nantes, France,* ***Xianwen Kong, Chengwei Zhang,*** *Heriot-watt University, Edinburgh, Scotland*

COMPLEXITY CRITERIA FOR THE PRELIMINARY DESIGN STAGE OF WALKING ROBOTS
Technical Paper Publication. DETC2017-68116

Da Xi, Feng Gao, *Shanghai Jiao Tong University, Shanghai, China*

MR-4-1: ORIGAMI-BASED ENGINEERING DESIGN KEYNOTE

EXHIBIT HALL LEVEL, ROOM 9 **8:00AM–9:00AM**

Session Organizer: **Mary Frecker,** *Pennsylvania State University, University Park, PA, USA*

FROM MICROMACHINES AND SURGICAL INSTRUMENTS TO SPACECRAFT: HOW ORIGAMI-BASED ENGINEERING CAN IM-PACT OUR WORLD
Keynote Presentation. DETC2017-68599

Larry L. Howell, *Brigham Young University, Provo, UT, USA*

MR-8-1: FLYING ROBOTS

EXHIBIT HALL LEVEL, ROOM 11 **8:00AM–9:00AM**

Session Organizer: **Amos Winter,** *MIT, Cambridge, MA, USA*

Session Co-Organizer: **Pinhas Ben-Tzvi,** *Virginia Tech, Blacksburg, VA, USA*

DESIGN OF A SPATIAL SIX-BAR FLAPPING WING MECHANISM FOR COMBINED CONTROL OF SWING AND PITCH
Technical Paper Publication. DETC2017-68266

Peter Lee-Shien Wang, J. Michael McCarthy, *University of California, Irvine, Irvine, CA, USA*

EXPERIMENTAL POWER MODEL IDENTIFICATION OF A FLAPPING WING AIR VEHICLE WITH FLIGHT TEST DATA
Technical Paper Publication. DETC2017-67904

John Gerdes, *US Army Research Laboratory, Aberdeen Proving Ground, MD, USA,* ***Hugh Bruck,*** *University of Maryland, College Park, MD, USA,* ***Satyandra Gupta,*** *University of Southern California, Los Angeles, CA, USA*

DESIGN OF THE I-BOOMCOPTER UAV FOR REMOTE SENSOR MOUNTING
Technical Paper Publication. DETC2017-67913

Daniel McArthur, *Purdue University, Lafayette, IN, USA,* ***Arindam Chowdhury, David Cappelleri,*** *Purdue University, West Lafayette, IN, USA*

MR-11-1: STUDENT MECHANISM & ROBOT DESIGN COMPETITION – ORAL PRESENTATIONS

BALLROOM LEVEL, ROOM 25B **8:00AM–9:00AM**

Session Organizer: **Brian Trease,** *The University of Toledo, Toledo, OH, USA*

Session Co-Organizer: **Joshua Bishop-Moser,** *University of Michigan, Ann Arbor, MI, USA*

Presentations Not Available at Press Time

MNS-5-1: FUNCTIONAL MATERIALS AND SURFACE ENGINEERING

EXHIBIT HALL LEVEL, ROOM 13 **8:00AM–9:00AM**

Session Organizer: **Longqiu Li,** *Harbin Institute of Technology, Harbin, Heilongjiang, China*

HYSTERESIS OPTIMIZATION IN CARBON NANOTUBE/THERMOPLASTIC NANOCOMPOSITES
Technical Presentation. DETC2017-68000

Giovanni Formica, Franco Milicchio, *University of RomeTre, Rome, Italy,* ***Giulia Lanzara,*** *University of Rome, Romatre, Rome, Italy,* ***Michela Talo,*** *University of RomeTre, Rome, Italy,* ***Walter Lacarbonara,*** *University of Rome La Sapienza-disg, Rome, Italy*

SELF-ACTIVATED MORPHING CARBON FIBER COMPOSITES VIA CYCLIC INTERNAL STRESSES
Technical Paper Publication. DETC2017-68012

Arnaldo Casalotti, Giulia Lanzara, *University of Rome, Romatre, Rome, Italy*

SEMICONDUCTOR TO METAL TRANSITION STUDY OF OXIDIZED VANADIUM THIN FILM
Technical Paper Publication. DETC2017-67926

Shifeng Yu, Lei Zuo, *Virginia Tech, Blacksburg, VA, USA,* ***Ming Lu,*** *Brookhaven National Lab, Upton, NY, USA,* ***Shuyu Wang,*** *Stony Brook University, Stony Brook, NY, USA*

MESA-19-1: MECHATRONICS AND INDUSTRY 4.0

EXHIBIT HALL LEVEL, ROOM 19 **8:00AM–9:00AM**

Session Organizer: **Po Ting Lin,** *National Taiwan University of Science and Technology, Taipei, Taiwan*

Session Co-Organizer: **Tapio Heikkilä,** *VTT Technical Research Centre of Finland, Oulu, Finland*

OBJECT RECOGNITION AND POSE ESTIMATION BASED ON COMBINED USE OF PROJECTION HISTOGRAMS AND SURFACE FITTING
Technical Paper Publication. DETC2017-67315

Jari Ahola, *VTT Technical Research Centre of Finland Ltd, Oulu, Finland,* ***Tapio Heikkilä,*** *VTT Technical Research Centre of Finland, Oulu, Finland*

DEXTEROUS GRIPPER SYNTHESIS FROM MODULAR FINGER APPROACH
Technical Paper Publication. DETC2017-67708

Nahian Rahman, *Istituto Italiano di Tecnologia, Genova, Italy,* ***Carlo Canali,*** *Advanced Industrial Automation lab, Genoa, Italy,* ***Darwin Caldwell,*** *Italian Institute of Technology, Genova, Italy,* ***Ferdinando Cannella,*** *Istituto Italiano di Tecnologia, Polverigi (AN), Italy*

IOT ARCHITECTURE FOR THE PROCESSING OF DATA COLLECTED BY A CENTRAL VACUUM CLEANER
Technical Paper Publication. DETC2017-67797

Marco Contigiani, Rama Pollini, Mirco Sturari, *Università Politecnica delle Marche, Ancona, Italy,* ***Adriano Mancini,*** *Universit Politecnica Delle Marche, Ancona, Italy,* ***Emanuele Frontoni,*** *Dipartimento di Ingegneria dell'Informazione–DII, Ancona, Italy*

MSNDC-2-1: NONLINEAR ENERGY TRANSFERS AND HARVESTING – 1

[Cross-listed with VIB-3]

BALLROOM LEVEL, ROOM 26B **8:00AM–9:00AM**

Session Organizer: **Wei Che Tai,** *Virginia Tech, Blacksburg, VA, USA*

THE EXPERIMENTAL STUDY ON A BISTABLE PIEZOELECTRIC-ELECTROMAGNETIC COMBINED VIBRATION ENERGY HARVESTER
Technical Paper Publication. DETC2017-67153

Minghui Yao, *College of Mechanical Engineering Beijing University of Technology, Beijing, China,* ***Pengfei Liu,*** *Beijing University of Technology, Beijing, China,* ***Wei Zhang,*** *Beijing University of Technology, Beijing, China,* ***Dongxing Cao,*** *Beijing University of Technology, Beijing, China*

AN IMPULSIVELY-EXCITED BISTABLE VIBRATION ENERGY HARVESTER USING MAGNETICALLY COUPLED FLEXTENSIONAL TRANSDUCER
Technical Presentation. DETC2017-67405

Hong-Xiang Zou, Wen-Ming Zhang, Wen-Bo Li, *Shanghai Jiao Tong University, Shanghai, China,* ***Xin-Sheng Wei, Sen Wang,*** *Shanghai Aerospace Control Technology Institute, Shanghai, China,* ***Guang Meng,*** *Shanghai Jiao Tong University, Shanghai, China*

MSNDC-6-1: TIME-VARYING AND TIME-DELAY SYSTEMS I

[Cross-listed with VIB-16]

BALLROOM LEVEL, ROOM 26C **8:00AM–9:00AM**

Session Organizer: **Bo Yu,** *University of Wisconsin-Platteville, Platteville, WI, USA*

BIFURCATION TREES OF PERIODIC MOTIONS IN A PARAMETRICALLY EXCITED PENDULUM
Technical Paper Publication. DETC2017-67161

Yu Guo, *Midwestern State University, Wichita Falls, TX, USA,* ***Albert Luo,*** *Southern Illinois University, Edwardsville, IL, USA*

PERIODIC MOTIONS AND BIFURCATION TREES IN A PARAMETRIC DUFFING OSCILLATOR
Technical Paper Publication. DETC2017-67206

Albert Luo, *Southern Illinois University, Edwardsville, IL, USA,* ***Haolin Ma,*** *Southern Illinois University Edwardsville, Edwardsville, IL, USA*

PERIOD-3 MOTIONS IN A PERIODICALLY FORCED, DAMPED, DOUBLE-WELL DUFFING OSCILLATOR WITH TIME-DELAY
Technical Paper Publication. DETC2017-67210

Albert Luo, *Southern Illinois University, Edwardsville, IL, USA,* ***Siyuan Xing,*** *Southern Illinois University Edwardsville, Edwardsville, IL, USA*

PTG-1-1: GEAR GEOMETRY (1)

EXHIBIT HALL LEVEL, ROOM 16 **8:00AM–9:00AM**

Session Organizer: **Alfonso Fuentes-Aznar,** *Rochester Institute of Technology, Rochester, NY, USA*

Session Co-Organizer: **Robert Handschuh,** *NASA Glenn Research Center, Cleveland, OH, USA*

OPTIMIZATION OF HYPOID GEAR DESIGN AND TOOTH CONTACT ANALYSIS
Technical Paper Publication. DETC2017-68407

Shouli Sun, Shilong Wang, *Chongqing University, Chongqing, Chongqing, China,* ***Yawen Wang,*** *University of Cincinnati, Cincinnati, OH, USA,* ***Teik Lim,*** *The University of Texas at Arlington, Fort Worth, TX, USA,* ***Baocang Zhou, Zongyan Hu,*** *Chongqing University, Chongqing, China*

RESEARCH ON CALCULATION OF UNLOADED TRANSMISSION ERROR OF PLANETARY GEAR TRAIN CAUSED BY ECCENTRICITY
Technical Paper Publication. DETC2017-67463

Shuaidong Zou, Guangjian Wang, Li Yu, *Chongqing University, Chongqing, China*

ROBUST DESIGN OF FACE-MILLED SPIRAL BEVEL GEARS FOR MINIMUM NOISE AND MAXIMUM LOAD CAPACITY WITH STOCHASTIC MISALIGNMENTS
Technical Presentation. DETC2017-68487

Alessio Artoni, Massimo Guiggiani, *University of Pisa, Pisa, Italy,* ***Ramón Ruiz Orzáez, Ignacio Gonzalez-Perez,*** *Universidad Politécnica de Cartagena, Cartagena, Spain,* ***Alfonso Fuentes-Aznar,*** *Rochester Institute of Technology, Rochester, New York, USA*

PTG-3-1: GEAR DYNAMICS AND NOISE (1)

EXHIBIT HALL LEVEL, ROOM 15 **8:00AM–9:00AM**

Session Organizer: **Murat Inalpolat,** *University of Massachusetts Lowell, Lowell, MA, USA*

Session Co-Organizer: **Ahmet Kahraman,** *Ohio State University, Columbus, OH, USA*

COUPLED DYNAMIC CHARACTERISTICS OF WIND TURBINE GEARBOX DRIVEN BY RING GEAR CONSIDERING GRAVITY
Technical Paper Publication. DETC2017-67305

Aiqiang Zhang, Jing Wei, *Chongqing University, Chongqing, China,* ***Datong Qin,*** *Chongqing University, Chongqing, China,* ***Shaoshuai Hou,*** *Chongqing University, Chongqing, China,* ***Teik Lim,*** *The University of Texas at Arlington, Fort Worth, TX, USA*

DYNAMIC TRANSMISSION ERROR MEASUREMENTS FROM SPUR GEAR PAIRS HAVING TOOTH INDEXING ERRORS
Technical Paper Publication. DETC2017-67314

Brian Anichowski, Jr., *The Ohio State University, Columbus, OH, USA,* ***Ahmet Kahraman,*** *Ohio State University, Columbus, OH, USA,* ***David Talbot,*** *Ohio State University | OSU, Columbus, OH, USA*

A HYBRID ANALYTICAL-COMPUTATIONAL METHOD FOR NONLINEAR GEAR DYNAMICS
Technical Presentation. DETC2017-67967

Xiang Dai, *Virginia Tech, Blacksburg, VA, USA,* ***Christopher G. Cooley,*** *Southern Illinois University Carbondale, Carbondale, IL, USA,* ***Robert Parker,*** *Virginia Tech, Blacksburg, VA, USA*

VIB-2-1: STRUCTURES AND CONTINUOUS SYSTEMS I

BALLROOM LEVEL, ROOM 25A **8:00AM–9:00AM**

Session Organizer: **Dumitru Caruntu,** *University of Texas Rio Grande Valley, Edinburg, TX, USA*

Session Co-Organizer: **Ebrahim Esmailzadeh,** *University of Ontario Inst of Tech, Oshawa, ON, Canada*

ELECTROSTATICALLY ACTUATED M/NEMS WITH CASIMIR EFFECT: PRIMARY RESONANCE COMPARISON BETWEEN THREE METHODS
Technical Paper Publication. DETC2017-67218

Dumitru Caruntu, Julio Beatriz, Christian Reyes, *University of Texas Rio Grande Valley, Edinburg, TX, USA*

A NEW GLOBAL SPATIAL DISCRETIZATION METHOD FOR TWO-DIMENSIONAL CONTINUOUS SYSTEMS
Student Competition Paper. DETC2017-68297

Kai Wu, *University of Maryland, Baltimore County, Baltimore, MD, USA,* ***Weidong Zhu,*** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

CORRECTION OF MULTIPLE TRANSDUCERS MASSES EFFECTS FROM THE MEASURED FRFS
Technical Paper Publication. DETC2017-67516

Jun Ren, Jun Wang, *Hubei University of Technology, Wuhan, China,* ***Xiaodong Zhou,*** *Beijing Institute of Control Engineering, Beijing, China,* ***Kwun-Lon Ting,*** *Tennessee Technological University, Cookeville, TN, USA*

VIB-15-4: MECHANICAL AND ACOUSTIC METAMATERIALS IV

BALLROOM LEVEL, ROOM 25C **8:00AM–9:00AM**

Session Organizer: **Ryan L Harne,** *The Ohio State University, Columbus, OH, USA*

Session Co-Organizers: **Massimo Ruzzene,** *Georgia Institute of Tech, Atlanta, GA, USA,* **Chengzhi Shi,** University of California Berkeley, Berkeley, CA, USA

ASSESSMENT OF UNCERTAINTY EFFECT IN PIEZOELECTRIC METAMATERIAL
Technical Presentation. DETC2017-67934

Wangbai Pan, Guoan Tang, *Fudan University, Shanghai, China,* ***Jiong Tang,*** *University of Connecticut, Storrs Mansfield, CT, USA*

2017 C. D. MOTE JR., EARLY CAREER AWARD LECTURE: METAMATERIAL CONCEPTS FOR ELASTIC WAVE FOCUSING AND HARVESTING
Award Lecture. DETC2017-68549

Alper Erturk, *Georgia Institute of Technology, Atlanta, GA, USA*

BIOMED-1-2: WEARABLE & IMPLANTABLE TECHNOLOGIES II

EXHIBIT HALL LEVEL, ROOM 21 **8:00AM–9:00AM**

Session Organizer: **Andres Tovar,** *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA*

EVALUATION OF PARAVALVULAR LEAKAGE IN A NOVEL MECHANICAL HEART VALVE PROTOTYPE
Technical Paper Publication. DETC2017-67729

Ankit Saxena, *Innovator Lab Consultants India Pvt Ltd, New Delhi, Delhi, India,* ***Rohan Shad,*** *University College of Medical Sciences, New Delhi, Delhi, India,* ***Mrudang Mathur, Anwesha Chattoraj,*** *Delhi Technological University, New Delhi, Delhi, India,* ***Sujay Shad,*** *Sir Ganga Ram Hospital, New Delhi, Delhi, India*

COMPUTATIONAL EVALUATION OF THE HAEMODYNAMIC PERFORMANCE OF A NOVEL PROSTHETIC HEART VALVE
Technical Paper Publication. DETC2017-67773

Mrudang Mathur, *Delhi Technological University, New Delhi, Delhi, India,* ***Ankit Saxena,*** *Innovator Lab Consultants India Pvt Ltd, New Delhi, Delhi, India,* ***Rohan Shad,*** *University College of Medical Sciences, New Delhi, Delhi, India,* ***Anwesha Chattoraj,*** *Delhi Technological University, New Delhi, Delhi, India*

TOWARDS THE OPTIMAL CROWN-TO-IMPLANT RATIO IN DENTAL IMPLANTS
Technical Paper Publication. DETC2017-67889

T. J. Sego, *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA,* ***Yung-Ting Hsu,*** *University of Detroit Mercy, Detroit, MI, USA,* ***Tien-Min Chu,*** *Indiana University, Indianapolis, IN, USA,* ***Andres Tovar,*** *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA*

AVT-1-1: ADVANCES IN GROUND VEHICLE DYNAMICS AND CONTROLS

EXHIBIT HALL LEVEL, ROOM 24 **9:10AM–10:50AM**

Session Organizer: **Vladimir V Vantsevich,** *The University of Alabama at Birmingham, Birmingham, AL, USA*

Session Co-Organizers: **Schalk Els,** *University of Pretoria, Hatfield, South Africa,* **Moustafa El-Gindy,** *Univeristy of Ontario Institute of Technology, Oshawa, ON, Canada*

OPTIMAL COLLISION-FREE PATH PLANNING FOR AN AUTONOMOUS MULTI-WHEELED COMBAT VEHICLE

Technical Paper Publication. DETC2017-67025

Amr Mohamed, *University of Ontario institute of technology (UOIT), Oshawa, ON, Canada,* ***Moustafa El-Gindy,*** *University of Ontario Institute of Technology, Oshawa, ON, Canada,* ***Haoxiang Lang,*** *University of Ontario Institute of Technology, Oshawa, ON, Canada,* ***Jing Ren,*** *University of Ontario institute of technology (UOIT), Oshawa, ON, Canada*

HANDLING PERFORMANCE IMPROVEMENT VIA STEERING REACTIVE TORQUE DESIGN BASED ON INTEGRATED DRIVER-VEHICLE MODEL

Technical Paper Publication. DETC2017-68139

Shuai Cheng, Jian Song, Zhenghong Lu, Wenlong Dong, *Tsinghua University, Beijing, China*

OPTIMIZATION OF NOVEL CORNER MODULE FOR URBAN ELECTRIC VEHICLE

Technical Paper Publication. DETC2017-68190

Allison Waters, Amir Khajepour, *The University of Waterloo, Waterloo, ON, Canada*

PEDAL ACTUATOR OF DRIVER ROBOT BASED ON FLEXIBLE MANIPULATOR

Technical Paper Publication. DETC2017-68100

Liangyao Yu, Sheng Zheng, *Tsinghua University, Beijing, China,* ***Jinghu Change, Xiaoxue Liu,*** *Tsinghua, Beijing, China*

CIE-22-1: MPS I

CONCOURSE LEVEL, ROOM 5 **9:10AM–10:50AM**

Session Organizer: **Robert E. Wendrich,** *IDE at University of Twente, Enschede, Netherlands*

DIGITALIZATION AND 3D SCANNING TO EXPLORE HIDDEN SHAPES IN ARCHEOLOGICAL ARTIFACTS

Technical Paper Publication. DETC2017-67318

Maura Mengoni, Alma Leopardi, *Polytechnic University of Marche, Ancona, Italy*

A CYBER-PHYSICAL GAMING SYSTEM FOR VOCATIONAL TRAINING

Technical Paper Publication. DETC2017-67560

Aparajithan Sivanathan, *Heriot-Watt University, Edinburgh, Scotland, United Kingdom,* ***Theo Lim,*** *Heriot-watt University, Edinburgh, Scotland,* ***Scott Mcgibbon, James Ritchie, Mohamed Abdel-Wahab,*** *Heriot-Watt University, Edinburgh, Scotland, United Kingdom*

ROBUST UNCONVENTIONAL INTERACTION DESIGN AND HYBRID TOOL ENVIRONMENTS FOR DESIGN AND ENGINEERING PROCESSES

Technical Paper Publication. DETC2017-67240

Robert E. Wendrich, I*DE at University of Twente, Enschede, Netherlands,* ***Ruben Kruiper,*** *Heriot Watt University, Edinburgh, Scotland*

IMMERSIVE VIRTUAL REALITY SYSTEM FOR TREATMENT OF PHANTOM LIMB PAIN (PLP)

Technical Paper Publication. DETC2017-68228

Mario Covarrubias Rodriguez, Politecnico Di Milano, Milan, Italy, ***Beatrice Aruanno,*** Politecnico Di Milano, Milan, Italy, ***Monica Bordegoni,*** Politecnico di Milano, Milan, Italy, ***Mauro Rossini,*** Villa Beretta Rehabilitation Center Valduce Hospital, Costa Masnaga, Italy, ***Franco Molteni,*** Villa Beretta Rehabilitation Center, Valduce Hospital, Costa Masnaga, Italy

ASSEMBLY REVIEW USING VIRTUAL REALITY ENABLED CAD

Technical Paper Publication. DETC2017-67878

Luis DeCasenave, *University of Puerto Rico at Mayaguez, Mayaguez, PR, USA,* ***José E. Lugo,*** *University of Puerto Rico, Mayaguez, PR, USA*

CIE-27-1: CIE INDUSTRY PANEL: COLLABORATIVE ENGINEERING DURING THE AGE OF DIGITALIZATION?

CONCOURSE LEVEL, ROOM 4 **9:10AM–10:50AM**

Session Organizer: **Marc Halpern,** *Gartner, Inc., Stamford, CT, USA*

Session Co-Organizer: **Pramita Mitra,** *Ford Motor Company, Bloomfield Township, MI, USA*

THE IMPACT OF DIGITALIZATION ON ENGINEERING AND DESIGN PRIORITIES

Panel. DETC2017-68586

Marc Halpern, *Gartner, Inc., Stamford, CT, USA*

METROLOGY IN THE AGE OF DIGITIZATION OF MANUFACTURING

Panel. DETC2017-68587

Vijay Srinivasan, *National Institute of Standards and Technology, Gaithersburg, MD, USA*

THE IMPACT OF PHYSICAL/DIGITAL CONVERGENCE ON ENGINEERING

Panel. DETC2017-68588

Brian Thompson, *PTC, Needham, MA, USA*

INFLUENCE OF EMERGING TRENDS ON TECHNOLOGY DEVELOPMENT FOR VEHICLE INTERIOR ENVIRONMENTS

Panel. DETC2017-68589

Angela Harris, *Ford Motor Company, Dearborn, MI, USA*

DAC-20-1: KEYNOTE LECTURE

CONCOURSE LEVEL, ROOM 1 **9:10AM–10:50AM**

Session Organizer: **Scott Ferguson,** *North Carolina State University, North Carolina, NC, USA*

DATA-DRIVEN ENGINEERING DESIGN

Elea McDonnell Feit, *Drexel University, Philadelphia, PA, USA,* ***Kemper Lewis,*** *University at Buffalo, Buffalo, NY, USA,* ***Ritesh Khire,*** *84.51° LLC, Cincinnati, OH, USA*

SESSION DEC-1-1: DESIGN EDUCATION IN THE UNDERGRADUATE CURRICULUM

EXHIBIT HALL LEVEL, ROOM 23 **9:10AM–10:50AM**

Session Organizer: **Janet Allen,** *University of Oklahoma, Oklahoma, OK, USA*

Session Co-Organizer: **Zahra Shahbazi,** *Manhattan College, Stamford, CT, USA*

AN AGENT-BASED MARKET SYSTEM SIMULATION FOR DESIGN EDUCATION

Technical Paper Publication. DETC2017-67358

Brendan Fay, Steven Hoffenson, *Stevens Institute of Technology, Hoboken, NJ, USA*

CAD PLATFORM INDEPENDENT SOFTWARE FOR AUTOMATIC GRADING OF TECHNICAL DRAWINGS

Technical Paper Publication. DETC2017-67612

Sanchit Ingale, *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA,* ***Anirudh Srinivasan,*** *Virginia Tech, Blacksburg, VA, USA,* ***Diana Bairaktarova,*** *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA*

DO TECHNOLOGICAL ADVANCEMENTS LEAD TO LEARNING ENHANCEMENTS?: AN EXPLORATION IN VIRTUAL PRODUCT DISSECTION

Technical Paper Publication. DETC2017-68237

Elizabeth Starkey, *Penn State, University Park, PA, USA,* ***Cailyn E. Spencer,*** *The Pennsylvania State University, University Park, PA, USA,* ***Kevin Lesniak,*** *Pennsylvania State University, Butler, PA, USA,* ***Conrad Tucker,*** *Penn State University, State College, PA, USA,* ***Scarlett Miller,*** *The Pennsylvania State University, University Park, PA, USA*

A DESIGN FOCUSED ENGINEERING OUTREACH TO MIDDLE SCHOOL USING ARDUINO PROJECTS

Technical Paper Publication. DETC2017-67165

Hyun Kwon, *Andrews University, Berrien Springs, MI, USA*

EFFECTS OF TECHNOLOGY ASSISTED FLAT LEARNING ENVIRONMENT FOR A DESIGN PROJECT AT A HISTORICALLY BLACK UNIVERSITY

Technical Paper Publication. DETC2017-67558

Madhumitha Ramachandran, Zahed Siddique, University of Oklahoma, Norman, OK, USA, ***Firas Akasheh,*** Tuskegee University, Tuskegee Inst, AL, USA, ***Gul Kremer,*** Iowa State University, Iowa, IA, USA

DFMLC-2-1: SUSTAINABLE DESIGN AND MANUFACTURING

EXHIBIT HALL LEVEL, ROOM 22 **9:10AM–10:50AM**

Session Organizer: **Bryony DuPont,** *Oregon State University, Oregon, OR, USA*

Session Co-Organizer: **Alessandra Papetti,** *Università Politecnica delle Marche, Rome, Italy*

ENVIRONMENTAL SUSTAINABILITY AWARENESS IN PRODUCT DESIGN PRACTICES: A SURVEY OF ITALIAN COMPANIES

Technical Paper Publication. DETC2017-67698

Claudio Favi, *Università degli Studi di Parma, Parma, Italy,* ***Michele Germani, Fabio Gregori, Marta Rossi, Eugenia Marilungo,*** *Universitã Politecnica Delle Marche, Ancona, Italy,* ***Marco Mandolini,*** *Università Politecnica Delle Marche, Italy,* ***Marco Marconi, Alessandra Papetti,*** *Università Politecnica delle Marche, Rome, Italy,*

LIFECYCLE TOOLS AS A SUPPORT FOR THE ECO-DESIGN INNOVATION OF DOMESTIC APPLIANCES LIFECYCLE TOOLS AS A SUPPORT FOR THE ECO-DESIGN INNOVATION OF DOMESTIC APPLIANCES

Technical Paper Publication. DETC2017-68141

Alessandra Papetti, *Università Politecnica delle Marche, Rome, Italy,* ***Michele Germani,*** *Università Politecnica delle Marche, Ancona, Italy,* ***Marco Marconi,*** *Università Politecnica delle Marche, Rome, Italy,* ***Claudio Favi,*** *Università degli Studi di Parma, Parma, Italy*

DESIGNING SUSTAINABLE MANUFACTURING NETWORKS: THE ROLE OF EXCLUSIVE SPECIES IN ACHIEVING ECOSYSTEM-TYPE CYCLING

Technical Paper Publication. DETC2017-68334

Astrid Layton, *Texas A&M University, College Station, TX, USA,* ***Bert Bras,*** *Georgia Inst of Tech, Atlanta, GA, USA,* ***Marc Weissburg,*** *Georgia Institute of Technology, Atlanta, GA, USA*

UNDERSTANDING THE SUSTAINABILITY OF ECO-LABELED PRODUCTS WHEN COMPARED TO CONVENTIONAL ALTERNATIVES

Technical Paper Publication. DETC2017-68339

Vincenzo Ferrero, Arvind Shankar Raman, *Oregon State University, Corvallis, OR, USA,* ***Bryony DuPont, Karl Haapala,*** *Oregon State University, Oregon, OR, USA*

MR-1-2: PARALLEL SYSTEMS II

EXHIBIT HALL LEVEL, ROOM 10 **9:10AM–10:50AM**

Session Organizer: **Damien Chablat,** *CNRS/LS2N, Nantes, France*

Session Co-Organizer: **Fengfeng Xi,** *Ryerson University, Toronto, ON, Canada*

CLEARANCE-INDUCED POSITION UNCERTAINTY OF PLANAR LINKAGES AND PARALLEL MANIPULATORS

Technical Paper Publication. DETC2017-67203

Kwun-Lon Ting, *Tennessee Technological University, Cookeville, TN, USA,* ***Kuan-Lun Hsu,*** *Tennessee Technological University, Cookeville, TN, USA*

KINEMATICS OF A PARTICULAR 3T1R PARALLEL MANIPULATOR OF TYPE 2PRPU

Technical Paper Publication. DETC2017-67174

Henrique Simas, *Federal University of Santa Catarina, Santa Catarina, Brazil,* ***Raffaele Di Gregorio,*** *University of Ferrara, Ferrara, Italy*

A FAST FORWARD KINEMATICS ALGORITHM FOR REAL-TIME AND HIGH-PRECISION CONTROL OF 3-RPS PARALLEL MECHANISM

Technical Paper Publication. DETC2017-68026

Yue Wang, *Beihang University, Beijing, China,* ***Jingjun Yu,*** *Beihang University/Robotics Institute, Beijing, China,* ***Xu Pei,*** *Beihang University, Beijing, China*

INFLUENCE COEFFICIENTS AND SINGULARITY ANALYSIS OF A NOVEL 3-UPU PARALLEL MECHANISM

Technical Paper Publication. DETC2017-68372

Ziming Chen, *Yanshan University, Qinhuangdao, Hebei Province, China,* ***Dongliang Cheng, Yang Zhang, Zhiwei Yang, Jin Zhou,*** *Yanshan University, Qinhuangdao, Hebei, China*

A NOVEL 3T1R PARALLEL ROBOT-2PARSS: DESIGN AND KINEMATICS

Technical Paper Publication. DETC2017-67265

Huiping Shen, Guowei Shao, Jiaming Deng, Ting-li Yang, *Changzhou University, Changzhou City, China*

MR-4-2: THERMAL-FLUID APPLICATIONS

EXHIBIT HALL LEVEL, ROOM 9 **9:10AM–10:50AM**

Session Organizer: **Robert Lang,** *Robert J. Lang Origami, Alamo, CA, USA*

Session Co-Organizer: **Ichiro Hagiwara,** *Meiji University, Kanagawa 247, Tokyo, Japan*

DESIGN OPTIMIZATION OF FOLDING SOLAR POWERED AUTONOMOUS UNDERWATER VEHICLE USING ORIGAMI ARCHITECTURE

Technical Paper Publication. DETC2017-67848

Doe Young Hur, Edwin Peraza Hernandez, Edgar Galvan, Darren Hartl, Richard Malak, *Texas A&M University, College Station, TX, USA*

GEOMETRIC ANALYSIS OF ADAPTIVE ORIGAMI CHANNELS FOR HEAT TRANSFER APPLICATIONS

Technical Paper Publication. DETC2017-68343

Nathan Price, Andrew Gillman, *UES, Inc, Beavercreek, OH, USA,* ***Kazuko Fuchi,*** *University of Dayton, Dayton, OH, OH, USA,* ***Edward J. Alyanak,*** *Air Force Research Laboratory, Wright-Patterson AFB, OH, USA,* ***Philip Buskohl,*** *Air Force Research Laboratory, Wright Patterson AFB, OH, USA*

EXPERIMENTAL CHARACTERIZATION OF PRESSURE LOSS CAUSED BY FLOW THROUGH FOLDCORE SANDWICH STRUCTURES

Technical Paper Publication. DETC2017-67890

Yves Klett, *Institute of Aircraft Design Uni Stuttgart, Stuttgart, Germany,* ***Carla Zeger, Peter Middendorf,*** *Universität Stuttgart, Stuttgart, Germany*

AN ORIGAMI-INSPIRED DESIGN OF A THERMAL MIXING ELEMENT WITHIN A CONCENTRATED SOLAR POWER SYSTEM

Technical Paper Publication. DETC2017-68360

Tyler Hamer, Lei Zhou, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***David Trumper,*** *Massachusetts Institute of Technology, Plaistow, NH, USA,* ***Alexander Slocum,*** *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Nicolas Calvet,*** *Masdar Institute of Science and Technology, Abu Dhabi, United Arab Emir.*

REALIZING ORIGAMI MECHANISMS FROM METAL SHEETS

Technical Paper Publication. DETC2017-68025

Erica Crampton, Spencer P. Magleby, *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

MR-8-2: LEGGED ROBOTS

EXHIBIT HALL LEVEL, ROOM 11 **9:10AM–10:50AM**

Session Organizer: **Satyandra Gupta,** *University of Southern California, Los Angeles, CA, USA*

Session Co-Organizer: **Mark Plecnik,** *University of California, Berkeley, Berkeley, CA, USA*

EXPLORATION OF TURNING STRATEGIES FOR AN UNCONVENTIONAL NON-ANTHROPOMORPHIC BIPEDAL ROBOT

Technical Paper Publication. DETC2017-68051

Jeffrey Yu, Joshua Hooks, Sepehr Ghassemi, Dennis Hong, *University of California, Los Angeles, Los Angeles, CA, USA*

TIME-OPTIMAL GAIT PLANNING FOR SIX-PARALLEL-LEGGED ROBOT WITH BOUNDED ACCELERATION AND VELOCITY

Technical Paper Publication. DETC2017-67624

Zhijun Chen, Feng Gao, *Shanghai Jiao Tong University, Shanghai, China*

DESIGN AND GAIT ANALYSIS OF A TWO LEGGED MINIATURE ROBOT WITH PIEZOELECTRIC-DRIVEN FOUR-BAR LINKAGE

Technical Paper Publication. DETC2017-67267

Audelia Gumarus Dharmawan, *Singapore University of Technology & Design, Singapore, Singapore,* ***Hassan Hariri,*** *SUTD, Singapore,* ***Gim Song Soh,*** *Singapore University of Technology and Design, Singapore,* ***Shaohui Foong,*** *SUTD, Singapore,* ***Kristin Wood,*** *Singapore University of Technology and Design, Singapore 487372, Singapore*

A MINIATURE, 3D-PRINTED, WALKING ROBOT WITH SOFT JOINTS

Technical Paper Publication. DETC2017-68182

Anthony R. DeMario, Jianguo Zhao, *Colorado State University, Fort Collins, CO, USA*

MODULAR DESIGN OF A PASSIVE, LOW-COST PROSTHETIC KNEE MECHANISM TO ENABLE ABLE-BODIED KINEMATICS FOR USERS WITH TRANSFEMORAL AMPUTATION

Technical Paper Publication. DETC2017-68278 *****Engineering For Global Development Paper*****

V.N. Murthy Arelekatti, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Youngjun Joh, J. Cali Warner, Molly A. Berringer, Paige J. Boehmcke, Jason Z. Fischman, Athena Y. Huang,*** *MIT, Cambridge, MA, USA,* ***Matthew Major,*** *Northwestern University, Chicago, IL, USA,* ***Amos Winter,*** *MIT, Cambridge, MA, USA*

MR-11-2: STUDENT MECHANISM & ROBOT DESIGN COMPETITION – INTERACTIVE POSTER EVALUATIONS

BALLROOM LEVEL, ROOM 25B **9:10AM–10:50AM**

Session Organizer: **Joshua Bishop-Moser,** *University of Michigan, Ann Arbor, MI, USA*

Session Co-Organizer: **Brian Trease,** *The University of Toledo, Toledo, OH, USA*

Presentations Not Available at Press Time

MNS-5-2: FUNCTIONAL MATERIALS AND SURFACE ENGINEERING II

EXHIBIT HALL LEVEL, ROOM 1 **9:10AM–10:50AM**

Session Organizer: **Longqiu Li,** *Harbin Institute of Technology, Harbin, Heilongjiang, China*

AUXETIC FILMS WITH A MINIATURIZED CELLULAR STRUCTURE
Technical Presentation. DETC2017-68009
Yingjie Chen, Giulia Lanzara, University of Rome, Romatre, Rome, Italy

CONTINUOUS FABRICATION OF FLEXIBLE CONDUCTIVE PATTERN THROUGH JET PRINTING OF IONIC INK WITH COLOR MAP DESIGN
Technical Presentation. DETC2017-68168

Yu Liu, *Jiangnan University, Wuxi, China,* ***Yongqiang Deng,*** *Chengdu Green Energy and Green Manufacturing Technology R&D Center, Chengdu, China*

OPTIMIZATION OF PLASMONIC AND ANTI-REFLECTIVE SURFACE TEXTURE IN THIN FILM SOLAR CELLS VIA SURROGATE MODELING
Technical Presentation. DETC2017-67194

Mine Kaya, Shima Hajimirza, *Texas A&M University, College Station, TX, USA*

COMPARISON THE INTERATOMIC POTENTIALS ON NANOSTRUCTURE OF AMORPHOUS CARBON
Technical Paper Publication. DETC2017-68466

Qingkang Liu, *Harbin Institute of Technology, Harbin, Nangang District, China,* ***Longqiu Li, Chutian Wang, Guangyu Zhang,*** *Harbin Institute of Technology, Harbin, Heilongjiang, China*

MESA-6-1: FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS (FDTA) I

EXHIBIT HALL LEVEL, ROOM 14 **9:10AM–10:50AM**

Session Organizer: **Yangquan Chen,** *University of California Merced, Merced, CA, USA*

RESEARCH OF PERMANENT MAGNET SYNCHRONOUS MOTOR SENSORLESS CONTROL BASED ON FRACTIONAL ORDER PLL
Technical Paper Publication. DETC2017-67070

Changhong Li, Dangwei Bian, *Northwest Institute of Mechanical & Electrical Engineering, Xianyang, Shaanxi, China,* ***Chaobo Chen, Song Gao,*** *Xi'an Technological University, Xi'an, Shaanxi, China*

NUMERICAL APPROXIMATION OF BASIC BAUNDARY-CONTACT PROBLEMS
Technical Paper Publication. DETC2017-67097

Manana Chumburidze, David M. Lekveishvili, *Akaki Tsereteli State University, Kutaisi, Imereti, Georgia*

ON THE EXISTENCE OF REGIONAL OPTIMAL CONTROL FOR A CLASS OF FRACTIONAL ORDER DIFFERENTIAL INCLUSIONS
Technical Paper Publication. DETC2017-67692

Binbin He, *Donghua University, Shanghai, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA,* ***Chunhai Kou,*** *Donghua University, Shanghai, China*

FURTHER REMARKS ON THE EXISTENCE OF PERIODIC SOLUTIONS OF LINEAR TIME VARYING PERIODIC FRACTIONAL ORDER SYSTEMS
Technical Paper Publication. DETC2017-67903

Xuefeng Zhang, *Northeastern University, Shenyang, Liaoning, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

A NOTE ON THE LYAPUNOV STABILITY OF FRACTIONAL-ORDER NONLINEAR SYSTEMS
Technical Paper Publication. DETC2017-68270

Sara Dadras, Soodeh Dadras, Hadi Malek, *Utah State University, Logan, UT, USA,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

MESA-14-1: ROBOTICS AND MOBILE MACHINES (RMM)

EXHIBIT HALL LEVEL, ROOM 19 **9:10AM–10:50AM**

Session Organizer: **Massimo Callegari,** *Polytechnic University of Marche, Ancona, Italy*

Session Co-Organizer: **Pushparaj Mani Pathak,** *Indian Institute of Technology, Roorkee, Roorkee, India*

PRELIMINARY TRIAL RESULTS FOR THE REDESIGNED STRIDER PLATFORM WITH SAMPLING CAPABILITY FROM DIFFERENT DEPTHS
Technical Paper Publication. DETC2017-67385

Rakesh Joshi, Nathan J. Bane, Justin E. Derickson, Mark E. Williams, Abhijit Nagchaudhuri, *University of Maryland Eastern Shore, Princess Anne, MD, USA*

FUNCTIONAL DESIGN AND OPTIMIZATION OF A NOVEL 3-URU MULTIMODAL RECONFIGURABLE ROBOT
Technical Paper Publication. DETC2017-67540

Luca Carbonari, David Corinaldi, Matteo Palpacelli, Giacomo Palmieri, *Università Politecnica delle Marche, Ancona, Ancona, Italy,* ***Massimo Callegari,*** *Polytechnic University of Marche, Ancona, Italy*

DEVELOPMENT OF MAGNETIC ADHESION BASED WHEEL-DRIVEN CLIMBING MACHINE FOR FERROUS SURFACE APPLICATIONS
Technical Paper Publication. DETC2017-67844

Ravindra Singh Bisht, Pushparaj Mani Pathak, *Indian Institute of Technology, Roorkee, Roorkee, India,* ***Saroj Kumar Panigrahi,*** *CSIR-Central Building Research Institute, Roorkee, Roorkee, India*

CORRECT-BY-CONSTRUCTION APPROACH FOR SELF-EVOLVABLE ROBOTS
Technical Paper Publication. DETC2017-68049

Gang Chen, *University of California, Davis, Davis, CA, USA,* ***Zhaodan Kong,*** *University of California Davis, Davis, CA, USA*

TOWARDS MULTI-BODY ANALYSES FOR ADVANCED FLEXIBLE ROBOTIC SYSTEMS
Technical Paper Publication. DETC2017-68095

Mariapaola D'Imperio, *Istituto Italiano Di Tecnologia, Genova, Italy,* ***Cristiano Pizzamiglio, Daniele Ludovico,*** *Politecnico di Torino, Torino, Italy,* ***Lando Mentrasti,*** *Universita Politecnica delle Marche, Ancona, Italy,* ***Carlo Canali,*** *Advanced Industrial Automation lab, Genoa, Italy,* ***Darwin Caldwell,*** *Italian Institute of Technology, Genova, Italy,* ***Ferdinando Cannella,*** *Istituto Italiano di Tecnologia, Polverigi (AN), Italy*

MSNDC-18-1: BEST PAPER AWARD COMPETITION

BALLROOM LEVEL, ROOM 26B **9:10AM–10:50AM**

Session Organizer: **Stefano Lenci,** *Polytechnic University of Marche, Ancona 60131, Italy*

Session Co-Organizer: **Hiroyuki Sugiyama,** *The University of Iowa, Iowa City, IA, USA*

INTEGRATING 3D STRESS ANALYSIS WITH FLEXIBLE MULTIBODY DYNAMICS SIMULATION
Technical Presentation. DETC2017-68605

Olivier Bauchau, *University of Maryland, College Park, Maryland 20742, MD, USA*

A PARTITIONED LAGRANGIAN-LAGRANGIAN APPROACH FOR FLUID-SOLID INTERACTION PROBLEMS
Technical Presentation. DETC2017-68606

Milad Rakhsha, *University of Wisconsin – Madison, WI, USA*

EFFECT OF INITIAL CURVATURE ON THE STATIC AND DYNAMIC BEHAVIOR OF MEMS RESONATORS
Technical Presentation. DETC2017-68608

Amal Z. Hajjaj, *King Abdullah University of Science and Technology, Makkah Province, Saudi Arabia*

PTG-1-2: GEAR GEOMETRY (2)

EXHIBIT HALL LEVEL, ROOM 16 **9:10AM–10:50AM**

Session Organizer: **Alessio Artoni,** *University of Pisa, Pisa, Italy*

Session Co-Organizer: **Yawen Wang,** *University of Cincinnati, Cincinnati, OH, USA*

COMPARISON OF CYCLO-PALLOID AND CYCLO-CUT CUTTING METHODS FOR GENERATION OF SPIRAL BEVEL GEARS
Technical Paper Publication. DETC2017-67793

Ignacio Gonzalez-Perez, *Polytechnic University of Cartagena, Cartagena, Spain,* ***Alfonso Fuentes-Aznar,*** *Rochester Institute of Technology, Rochester, NY, USA*

RESEARCH ON THE TOOTH MODIFICATION FOR NON-CIRCULAR STRAIGHT BEVEL GEARS
Technical Paper Publication. DETC2017-67663

Lin Hua, Fangyan Zheng, Xinghui Han, Dingfang Chen, Yaxiong Hu, *Wuhan University of Technology, Wuhan, China*

RATING OF HELICAL ASYMMETRIC TOOTH GEARS
Technical Presentation. DETC2017-68108

Alexander Kapelevich, Yuriy Shekhtman, *AKGears, LLC, Shoreview, MN, USA*

PLANAR TOOTH PROFILE SYNTHESIS FOR RELATIVE CURVATURE
Technical Paper Publication. DETC2017-68326

Zhiyuan Yu, *Tennessee Technological University, Cookeville, TN, USA,* ***Kwun-Lon Ting,*** *Tennessee Technological University, Cookeville, TN, USA*

ROTOR PROFILE DESIGN OF 2-3 TYPE TWIN-SCREW PUMPS BASED ON CFD
Technical Paper Publication. DETC2017-67498

Qian Tang, Di Yan, *Chongqing University, Chongqing, China,* ***Linqing Pei,*** *Chongqing Deheng Technology Co., Ltd, Chongqing, China,* ***Yuanxun Zhang,*** *Chongqing University, Chongqing, China*

PTG-3-2: GEAR DYNAMICS AND NOISE (2)

EXHIBIT HALL LEVEL, ROOM 15 **9:10AM–10:50AM**

Session Organizer: **David Talbot,** *Ohio State University | OSU, Columbus, OH, USA*

Session Co-Organizer: **Jing Wei,** *Chongqing University, Chongqing, China*

CALCULATION OF TIME-VARYING MESH STIFFNESS AFFECTED BY LOAD BASED ON FEM
Technical Paper Publication. DETC2017-67043

Yimin Shao, Cheng Qian, Jing Liu, Lei Yin, *Chongqing University, Chongqing, China,* ***Minggang Du, Yang Yang,*** *China North Vehicle Research Institute, Beijing, China*

GEAR TOOTH MESH STIFFNESS CALCULATIONS AND THEIR IMPACT ON ANALYTICAL MODELS
Technical Presentation. DETC2017-68488

Christopher G. Cooley, *Southern Illinois University Carbondale, Carbondale, IL, USA,* ***Chunguang Liu,*** *Personal Residence Address, Blacksburg, VA, USA,* ***Xiang Dai, Robert Parker,*** *Virginia Tech, Blacksburg, VA, USA*

DYNAMIC BEHAVIOR ANALYSIS OF STAR HERRINGBONE GEAR WITH TOOTH PROFILE MODIFICATION
Technical Presentation. DETC2017-67065

An Pei, *Northwestern Polytechnical University, Xi'an City, Shaanxi Province, China,* ***Feiming Wang,*** *Aviation Industry Corporation of China Design Institute 606, Shenyang City, Liaoning Province, China,* ***Sanmin Wang,*** *Northwestern polytechnical University, Xi'an City, Shaanxi province, China*

STUDY ON THE NORMAL CONTACT STIFFNESS OF ROUGH SURFACE IN MIXED LUBRICATION
Technical Paper Publication. DETC2017-67088

Huifang Xiao, Yunyun Sun, *University of Science and Technology Beijing, China,* ***Xiaojun Zhou,*** *China Ship Research and Develop-ment Academy, Beijing, China,* ***Zaigang Chen,*** *Southwest Jiaotong University, Chengdu, Sichuan, China*

VIB-1-1: KEYNOTE LECTURE

BALLROOM LEVEL, ROOM 26A **9:10AM–10:50AM**

Session Organizer: **Dumitru Caruntu,** *University of Texas Rio Grande Valley, Edinburg, TX, USA*

Session Co-Organizer: **Matthew Brake,** *William Marsh Rice University, Houston, TX, USA*

INSPIRED BY NATURE – ADAPTIVE MODULAR METASTRUCTURES
Keynote Presentation. DETC2017-68600

Kon-Well Wang, *University of Michigan, Ann Arbor, MI, USA*
**** 2017 J.P. Den Hartog Awardee ****

BIOMED-1-1: WEARABLE & IMPLANTABLE TECHNOLOGIES I

EXHIBIT HALL LEVEL, ROOM 21 **9:10AM–10:50AM**

Session Organizer: **Ehsan T. Esfahani,** *State University of New York at Buffalo, Buffalo, NY, USA*

Session Co-Organizer: **Souma Chowdhury,** *University at Buffalo, Buffalo, NY, USA*

SIGNAL ENHANCEMENT OF ELECTRO-CHEMI-LUMINESCENT SENSOR WITH MOBILE PHONES
Poster Paper Presentation. DETC2017-67164

Hyun Kwon, Daniel Marsh, *Andrews University, Berrien Springs, MI, USA*

A STUDY OF RAPID TETRAPOD RUNNING AND TURNING DYNAMICS UTILIZING INERTIAL MEASUREMENT UNITS IN GREYHOUND SPRINTING
Technical Paper Publication. DETC2017-67691

Hasti Hayati, *UTS, Sydney/Ultimo, NSW, Australia,* ***David Eager,*** *University of Technology, Sydney, Sydney/Ultimo, NSW, Australia,* ***Ardian Jusufi, Terry Brown,*** *University of Technology Sydney, Sydney/Ultimo, NSW, Australia*

A SMART DEVICE TO SUBSTITUTE THE NEUROTHESIOMETER
Technical Paper Publication. DETC2017-68306

Neil Vaughan, Venketesh Dubey, *Bournemouth University, Poole, United Kingdom,* ***Tamas Hickish,*** *Royal Bournemouth & Christ-church Hospitals NHS Foundation Trust, Bournemouth, United Kingdom,* ***Jonathan Cole,*** *Poole Hospital HNS Foundation Trust, Poole, United Kingdom*

MONITORING REHABILITATION PARAMETERS IN STROKE PATIENTS
Technical Presentation. DETC2017-68313

Neil Vaughan, Venketesh Dubey, *Bournemouth University, Poole, United Kingdom*

OPTIMAL METAMODELING TO INTERPRET ACTIVITY-BASED HEALTH SENSOR DATA
Technical Paper Publication. DETC2017-68385

Souma Chowdhury, *University at Buffalo, Buffalo, NY, USA,* ***Ali Mehmani,*** *Columbia University, New York, NY, USA*

AVT-1-3: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 24 **11:00AM–12:00PM**

Session Organizer: **Alan Mayton,** *CDC/NIOSH/Pittsburgh Mining Research Division, Pittsburgh, PA, USA*

Session Co-Organizer: **Lei Zuo,** *Virginia Tech, Blacksburg, VA, USA*

CYBER PROVING GROUND FOR INTELLIGENT VEHICLES ON DRIVING SIMULATOR
Keynote Presentation. DETC2017-68600

Xin Guan, Jilin University, Changchun, China

CIE-34-1: KEYNOTE LECTURE

CONCOURSE LEVEL, ROOM 1 **11:00AM–12:00PM**

Session Organizer: **Marc Halpern,** *Gartner, Inc., Stamford, CT, USA*

DATA, ANALYTICS, AND INTERNET OF THINGS: THE PERFECT STORM AND SOME GRAND CHALLENGES

Gahl Berkooz, *Acorns, USA*

SESSION DAC-8-1: DESIGN FOR RESILIENCE AND FAILURE RECOVERY 1

[Cross-listed with CIE-29]

CONCOURSE LEVEL, ROOM 7 **11:00AM–12:00PM**

Session Organizer: **Pingfeng Wang,** *Industrial And Manufacturing Engineering, Wichita, KS, USA*

Session Co-Organizer: **Chao Hu,** *Iowa State University, Ames, IA, USA*

RESILIENT SYSTEM DESIGN USING COST-RISK ANALYSIS WITH FUNCTIONAL MODELS
Technical Paper Publication. DETC2017-67952

Elham Keshavarzi, *Oregon State University, Beaverton, OR, USA,* ***Matthew G. McIntire,*** *Oregon State University, Corvallis, OR, USA,* ***Kai Goebel,*** *Nasa Ames, Moffett Field, CA, USA,* ***Irem Tumer,*** *Dept. of Mechanical Engineering, Corvallis, OR, USA,* ***Christopher Hoyle,*** *Oregon State University, Corvallis, OR, USA*

ENABLING RESILIENCE THROUGH A CONTROL-GUIDED FAILURE RECOVERY
Technical Paper Publication. DETC2017-67625

Nita Yodo, *Wichita State University, Wichita, KS, USA,* ***Pingfeng Wang,*** *Industrial and Manufacturing Engineering, Wichita, KS, USA,* ***Melvin Rafi,*** *Wichita State University, Wichita, KS, USA*

ENSEMBLE PROGNOSTICS WITH DEGRADATION-DEPENDENT WEIGHTS: PREDICTION OF REMAINING USEFUL LIFE FOR AIRCRAFT ENGINES
Technical Paper Publication. DETC2017-68315

Zhixiong Li, *Iowa State University, Ames, IA, USA,* ***Dazhong Wu,*** *Pennsylvania State University, State College, PA, USA,* ***Chao Hu,*** *Iowa State University, Ames, IA, USA,* ***Janis Terpenny,*** *Pennsylvania State University, University Park, PA, USA,* ***Sheng Shen,*** *Iowa State University, Ames, IA, USA*

DAC-11-1: DESIGN OF ENGINEERING MATERIALS AND STRUCTURES 1

CONCOURSE LEVEL, ROOM 6 **11:00AM–12:00PM**

Session Organizer: **Hongyi Xu,** *Ford, Dearborn, MI, USA*

Session Co-Organizer: **Seung-Kyum Choi,** *Georgia Tech, Atlanta, GA, USA*

BAYESIAN NETWORK STRUCTURE OPTIMIZATION FOR IMPROVED DESIGN SPACE MAPPING FOR DESIGN EXPLORATION WITH MATERIALS DESIGN APPLICATIONS
Technical Paper Publication. DETC2017-67643

Conner Sharpe, Clinton Morris, Benjamin Goldsberry, *University of Texas at Austin, Austin, TX, USA,* ***Carolyn Seepersad,*** *University of Texas at Austin, Austin, TX, USA,* ***Michael R. Haberman,*** *University of Texas at Austin, Austin, TX, USA*

SCALABLE MICROSTRUCTURE RECONSTRUCTION WITH MULTI-SCALE PATTERN PRESERVATION
Technical Paper Publication. DETC2017-68286

Ruijin Cang, Aditya Vipradas, Yi Ren, *Arizona State University, Tempe, AZ, USA*

STUDY OF THE DESIGN REPRESENTATION METHODS FOR THE OPTIMIZATION OF MULTI-LAYER COMPOSITE STRUCTURES
Technical Paper Publication. DETC2017-67309

Hongyi Xu, *Ford, Dearborn, MI, USA,* ***Junqi Yang,*** *Chongqing University, Chongqing, China,* ***Ching-Hung Chuang,*** *Ford Motor Company, Dearborn, MI, USA,* ***Zhenfei Zhan,*** *Chongqing University, Chongqing, China*

DEC-5-1: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 23 **11:00AM–12:00PM**

Session Organizer: **Zahra Shahbazi,** *Manhattan College, Stamford, CT, USA*

RADICAL COLLABORATION BY DESIGN IN ENGINEERING EDUCATION

Sunand Bhattacharya, *Autodesk, Inc.*

DFMLC-1-1: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 22 **11:00AM–12:00PM**

Session Organizer: **Qing Wang,** *Durham University, Durham, United Kingdom*

SUSTAINING "SMALL SCALE" RESEARCH OVER THE LONG TERM
Keynote Presentation. DETC2017-68602

David Harrison, *Glasgow Caledonian University, Glasgow, United Kingdom*

SESSION DTM-11-1: DESIGN OF COMPLEX SYSTEMS I

EXHIBIT HALL LEVEL, ROOM 20 **11:00AM–12:00PM**

Session Organizer: **Katherine Fu,** *Georgia Institute of Technology, Atlanta, GA, USA*

Session Co-Organizer: **Jitesh Panchal,** *Purdue University, West Lafayette, IN, USA*

A FRAMEWORK FOR DESIGNING AND MANAGING FLEXIBILITY AND REAL OPTIONS IN ENGINEERING SYSTEMS BASED ON DECISION RULES
Technical Paper Publication. DETC2017-67042

Qihui Xie, *PropertyGuru, Singapore,* ***Michel-Alexandre Cardin,*** *National University of Singapore, Singapore*

DESIGN HEURISTICS: A CONCEPTUAL FRAMEWORK AND PRELIMINARY METHOD FOR EXTRACTION
Technical Paper Publication. DETC2017-67467

Bumsoo Lee, Kenton B. Fillingim, William Binder, Katherine Fu, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Christiaan Paredis,*** *Georgia Inst of Tech, Atlanta, GA, USA*

THE STRUCTURE OF VULNERABLE NODES IN BEHAVIORAL NETWORK MODELS OF COMPLEX ENGINEERED SYSTEMS
Technical Paper Publication. DETC2017-67866

Hannah Walsh, *Oregon State University, Corvallis, OR, USA,* ***Andy Dong,*** *University of Sydney, Sydney NSW, Australia,* ***Irem Tumer,*** *Dept. of Mechanical Engineering, Corvallis, OR, USA*

MR-9-1: KEYNOTE LECTURE

BALLROOM LEVEL, ROOM 26A **11:00AM–12:00PM**

Session Organizer: **James Schmiedeler,** *University of Notre Dame, Notre Dame, IN, USA*

ANIMALS AS MODELS FOR ROBOT MOBILITY AND AUTONOMY: CRAWLING, WALKING, RUNNING, CLIMBING AND FLYING
Keynote Presentation. DETC2017-68603

Roger Quinn, *Case Western Reserve University, Cleveland, OH, USA*

MNS-1-1: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 13 **11:00AM–12:00PM**

Session Organizer: **Slava Krylov,** *Tel Aviv University, Tel Aviv, Israel*

Session Co-Organizer: **Mohammad Younis,** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

ATOMIC FORCE MICROSCOPY IMAGING AND SPECTROSCOPY OF SOFT MATTER AND COMPLEX MATERIALS ENABLED BY NANOMECHANICS AND MICROCANTILEVER DYNAMICS

Arvind Raman, *Purdue University, West Lafayette, IN, USA*

MESA-23-1: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 19 **11:00AM–12:00PM**

Session Organizer: **Tapio Heikkilä,** *VTT Technical Research Centre of Finland, Oulu, Finland*

EVOLUTION OF EMBEDDED PLATFORMS FOR CYBER-PHYSICAL SYSTEMS

James H. Christensen, *Holobloc Inc., Cleveland, OH, USA*

MSNDC-2-2: NONLINEAR ENERGY TRANSFERS AND HARVESTING – 2

[Cross-listed with VIB-3]

BALLROOM LEVEL, ROOM 26B **11:00AM–12:00PM**

Session Organizer: **Jose Manoel Balthazar,** *Aeronautics Technological Institute, São José dos Campos, Brazil*

DYNAMICS AND POWER ABSORPTION OF A SELF-REACT WAVE ENERGY CONVERTER WITH MECHANICAL POWER TAKEOFF SYSTEM
Technical Paper Publication. DETC2017-67464

Changwei Liang, *Stony Brook University, Stony Brook, NY, USA,* ***Xiaofan Li,*** *Virginia Tech, Blacksburg, VA, USA,* ***Dillon Martin,*** *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA,* ***Adam Wise, Robert Parker,*** *Virginia Tech, Blacksburg, VA, USA,* ***Khai Ngo,*** *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

ON MODE COUPLING ANALYSIS AND STABILITY REGIONS TO ENERGY HARVESTING IN A TWO-DEGREES-OF-FREEDOM PORTAL FRAME PLATFORM
Technical Paper Publication. DETC2017-67532

Rodrigo Tumolin Rocha, *Federal University of Technology – Parana, Brazil,* ***Jose Manoel Balthazar,*** *Aeronautics Technological Institute, São José dos Campos, Brazil,* ***Angelo M. Tusset,*** *Vinicius' Piccirillo, Frederic Conrad Janzen, Federal University of Technology – Parana, Brazil,* ***Jorge Luis Palacios Felix,*** *Federal University of Fronteira Sul, Cerro Largo, Rio Grande do Sul, Brazil*

PERFORMANCE OF NONLINEAR TARGETED ENERGY TRANSFER UNDER STOCHASTIC AND DETERMINISTIC EXCITATIONS
Technical Presentation. DETC2017-67569

Vincent Marre, *Institut Superieur de l'Aeronautique et de l'Espace (ISAE), Toulouse, France, Guilhem Michon, ISAE, Toulouse Cedex 4, France,* ***Vincent Manet,*** *Liebherr Aerospace, Toulouse, France*

MSNDC-4-1: CONTACT AND INTERFACE DYNAMICS

[Cross-listed with VIB-6]

BALLROOM LEVEL, ROOM 25C **11:00AM–12:00PM**

Session Organizer: **Marek Wojtyra,** *Warsaw University of Technology, Warsaw, Poland*

Session Co-Organizer: **Arman Pazouki,** *California State University, Los Angeles, Los Angeles, CA, USA*

ADVANCEMENT OF CONTACT DYNAMICS MODELING FOR HUMAN SPACEFLIGHT SIMULATION APPLICATIONS
Technical Paper Publication. DETC2017-67936

Thomas A. Brain, Erik B. Kovel, John R. Maclean, *METECS, Houston, TX, USA,* ***Leslie J. Quiocho,*** *NASA/Johnson Space Center, Houston, TX, USA*

A FRICTION MODEL FOR NON-SINGULAR COMPLEMENTARITY FORMULATIONS FOR MULTIBODY SYSTEMS WITH CONTACTS
Technical Paper Publication. DETC2017-67988

Albert Peiret, Jozsef Kovecses, *McGill University, Montreal, QC, Canada,* ***Josep M. Font-Llagunes,*** *Universitat Politecnica de Catalunya, Barcelona, Spain*

DYNAMIC RESPONSE OF MECHANISMS WITH PLANAR AND SPATIAL CLEARANCE JOINTS
Technical Presentation. DETC2017-68215

Paulo Flores, *University of Minho, Guimaraes, Portugal*

PTG-9-1: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 16 **11:00AM–12:00PM**

Session Organizer: **Teik Lim,** *The University of Texas at Arlington, Fort Worth, TX, USA*

Session Co-Organizer: **Qi Fan,** *Gleason Corporation, Rochester, NY, USA*

ROLE OF GEARS IN ELECTRIFIED VEHICLES

Karsten Stahl, *Technical University of Munich, Germany*

VIB-2-2: STRUCTURES AND CONTINUOUS SYSTEMS II

BALLROOM LEVEL, ROOM 25A **11:00AM–12:00PM**

Session Organizer: **Dumitru Caruntu,** *University of Texas Rio Grande Valley, Edinburg, TX, USA*

Session Co-Organizer: **Ebrahim Esmailzadeh,** *University of Ontario Inst of Tech, Oshawa, ON, Canada*

LINEAR AND NON-LINEAR AEROELASTIC ANALYSIS OF A HIGH ASPECT RATIO WING
Technical Paper Publication. DETC2017-67289

Firooz Bakhtiari-Nejad, Amir Hossein Modarres Aval, *Amirkabir University of Technology, Tehran, Iran,* ***Earl H. Dowell,*** *Duke University, Durham, NC, USA,* ***Hossein Shahverdi,*** *Amirkabir University of Technology, Tehran, Iran*

REDUCED ORDER LEVEL MODELING OF STRUCTURAL UNCERTAINTY FOR THE DYNAMICS OF NEARLY-STRAIGHT PIPES CONVEYING FLUID
Technical Presentation. DETC2017-68005

Shrinil Shah, Marc P. Mignolet, *Arizona State University, Tempe, AZ, USA*

FLOW-INDUCED NONLINEAR VIBRATION OF NON-UNIFORM NANOTUBES
Technical Paper Publication. DETC2017-68208

Shamim Mashrouteh, *University of Ontario Institute of Technology, Oshawa, ON, Canada,* ***Ahmad Barari,*** *University of Ontario Inst of Tech, Oshawa, ON, Canada,* ***Ebrahim Esmailzadeh,*** *University of Ontario Inst of Tech, Oshawa, ON, Canada*

VIB-9-1: SYSTEM IDENTIFICATION, DAMAGE DETECTION AND DIAGNOSTICS I

BALLROOM LEVEL, ROOM 25B **11:00AM–12:00PM**

Session Organizer: **Weidong Zhu,** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

AN IMPROVED RE-SCALING FREQUENCY STOCHASTIC RESONANCE AND ITS APPLICATION TO WEAK FAULT SIGNAL DETECTION
Technical Paper Publication. DETC2017-67160

Jinjun Liu, Yong Gang Leng, Shengbo Fan, Xiaojun Ma, *Tianjin University, Tianjin, China*

ALGORITHM FOR MULTIPLE TIME-FREQUENCY CURVE EXTRACTION FROM TIME-FREQUENCY REPRESENTATION OF VIBRATION SIGNALS FOR BEARING FAULT DIAGNOSIS UNDER TIME-VARYING SPEED CONDITIONS
Student Competition Paper. DETC2017-67171

Huan Huang, Natalie Baddour, Ming Liang, *University of Ottawa, Ottawa, ON, Canada*

SCALING MODE SHAPES IN OUTPUT-ONLY STRUCTURE BY A MASS-CHANGE-BASED METHOD
Technical Presentation. DETC2017-67396

Liangliang Yu, Mengshi Jin, Hanwen Song, *Tongji University, Shanghai, China*

VIB-16-1: TIME-VARYING AND TIME-DELAY SYSTEMS I

[Cross-listed with MSNDC-6]

BALLROOM LEVEL, ROOM 26C **11:00AM–12:00PM**

Session Organizer: **Matthew Allen,** *University of Wisconsin-Madison, WI, USA*

APPROXIMATE SOLUTION TO A CLASS OF DELAY DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS
Technical Presentation. DETC2017-67393

Mengshi Jin, Wei Chen, Hanwen Song, Jian Xu, *Tongji University, Shanghai, China*

ANALYSIS OF THE PERIODIC DAMPING COEFFICIENT EQUATION BASED ON FLOQUET THEORY
Technical Paper Publication. DETC2017-68450

Fatemeh Afzali, *Michigan State University, East Lansing, MI, USA,* ***Gizem Acar,*** *University of Maryland, College Park, MD, USA,* ***Brian Feeny,*** *Michigan State University, East Lansing, MI, USA*

BIOMED-2-1: BIOROBOTICS AND HAPTICS I

EXHIBIT HALL LEVEL, ROOM 21 **11:00AM–12:00PM**

Session Organizer: **Mahdi Haghshenas-Jaryani,** *UTA Research Institute, Fort Worth, TX, USA*

A 3-LEGGED PARALLEL ROBOT FOR LONG BONE FRACTURE ALIGNMENT
Technical Paper Publication. DETC2017-67262

Mohammad Abedinnasab, *Rowan University, Glassboro, NJ, USA,* ***Farzam Farahmand,*** *Sharif University of Technology, Tehran, Iran,* ***Jaime Gallardo-Alvarado,*** *Instituto Tecnologico De Celaya, Celaya/Gto, TL, Mexico*

SOFT ROBOTIC REHABILITATION EXOSKELETON (REHAB GLOVE) FOR HAND THERAPY
Technical Paper Publication. DETC2017-68291

Mahdi Haghshenas-Jaryani, *UTA Research Institute, Fort Worth, TX, USA,* ***Caleb P. Nothnagle,*** *University of Texas at Arlington Research Institute, Fort Worth, TX, USA,* ***Rita Patterson, Nicoleta Bugnariu,*** *University of North Texas Health Science Center, Fort Worth, TX, USA,* ***Muthu B.J. Wijesundara,*** *University of Texas at Arlington Research Institute, Fort Worth, TX, USA*

DESIGN OF A 2D HAPTIC SYSTEM WITH PASSIVE VARIABLE STIFFNESS USING PERMANENT MAGNETS FOR UPPER-LIMB REHABILITATION
Technical Paper Publication. DETC2017-67669

Sri Sadhan Jujjavarapu, *State University of New York at Buffalo, Buffalo, NY, USA,* ***Amirhossein H. Memar,*** *University at Buffalo, Buffalo, NY, USA,* ***Ehsan T. Esfahani,*** *State University of New York at Buffalo, Buffalo, NY, USA*

AVT-1-2: ADVANCES IN GROUND VEHICLES DYNAMICS AND CONTROLS

EXHIBIT HALL LEVEL, ROOM 24 **2:00PM–3:40PM**

Session Organizer: **Liangyao Yu,** *Tsinghua University, Beijing, China*

Session Co-Organizers: **Beshah Ayalew,** *Clemson University, Greenville, SC, USA,* **Gangfeng Tan,** *Wuhan University of Technology & Virginia Polytechnic Institute and State University, Wuhan, China*

A SEMI-ANALYTICAL TYRE MODEL FOR THE STUDY OF TYRE/RIM INTERACTION ON A ROAD VEHICLE
Technical Paper Publication. DETC2017-67730

Federico Ballo, *Politecnico Di Milano, Milan, Italy,* ***Giorgio Previati,*** *Politecnico Di Milano, Milan, Italy,* ***Massimiliano Gobbi, Gianpiero Mastinu,*** *Politecnico di Milano, Milan, Italy*

A NON-ITERATIVE CARRIER PHASE DIFFERENTIAL GNSS KINEMATIC LOCALIZATION METHOD
Technical Paper Publication. DETC2017-68209

Mohammad Hadi Tabatabaee, *University of California, Davis, Davis, CA, USA,* ***Bahram Ravani,*** *University of California, Davis, Davis, CA, USA*

ANALYSIS OF MAXIMUM POSSIBLE SAMPLING PERIOD FOR A REAL-TIME VISION-BASED CONTROL SYSTEM
Technical Paper Publication. DETC2017-68355

Bo Shang, Chengdong Wu, Yunzhou Zhang, *Northeastern University, Shenyang, Liaoning, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

CIE-8-1: CAPPD GENERAL I

CONCOURSE LEVEL, ROOM 4 **2:00PM–3:40PM**

Session Organizer: **John Steuben,** *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA*

FEATURE RECOGNITION AND PARAMETRIZATION METHODS FOR ALGORITHM-BASED PRODUCT DEVELOPMENT PROCESS
Technical Paper Publication. DETC2017-67031

Thiago Weber Martins, *Technische Universität Darmstadt – Department of Computer Integrated Design, Darmstadt, Hessen, Germany,* ***Reiner Anderl,*** *Technische Universität Darmstadt – Computer Integrated Design, Darmstadt, Germany*

3D PRINTED ELECTRONICS: OPPORTUNITIES AND CHALLENGES FROM CASE STUDIES
Technical Paper Publication. DETC2017-67503

Yu Song, Roy Boekraad, Lampros Roussos, Adrie Kooijman, Charlie C. L. Wang, Jo Geraedts, *Delft University of Technology, Delft, Zuid-Holland, Netherlands*

A FEASIBLE SEQUENCE ORIENTED DISCRETE PARTICLE SWARM OPTIMIZATION FOR OPERATION SEQUENCING IN CAPP
Technical Paper Publication. DETC2017-67630

Jianping Dou, *Southeast University, Nanjing, China,* ***Xia Zhao,*** *Nanjing University of Finance and Economics, Nanjing, China*

A NOVEL TRANSITION REGION REPRESENTATION FOR ADDITIVE MANUFACTURING FOR GRADED MATERIALS, STRUCTURES AND TOLERANCES
Technical Paper Publication. DETC2017-68390

Gaurav Ameta, *Dakota Consulting Inc., Gaithersburg, MD, USA,* ***Paul Witherell,*** *NIST, Gaithersburg, MD, USA*

APPLICATION OF T-MAPS FOR COMPOSITE POSITION TOLERANCE FOR PATTERNS OF FEATURES
Technical Paper Publication. DETC2017-68391

Gaurav Ameta, *Dakota Consulting Inc., Gaithersburg, MD, USA,* ***Gagandeep Singh,*** *Salesforce, San Francisco, CA, USA,* ***Joseph Davidson, Jami Shah,*** *Arizona State University, Tempe, AZ, USA*

CIE-22-2: MPS II

CONCOURSE LEVEL, ROOM 5 **2:00PM–3:40PM**

Session Organizer: **Robert E. Wendrich,** *IDE at University of Twente, Enschede, Netherlands*

SENSIBLE PATHWAYS FOR SENSORIUM-GAMENESS INTEGRATION AND EMBEDMENT IN DESIGN TOOLS FOR MULTI-PHASE ITERATIVE CREATIVE SYNTHESIS IN DESIGN AND ENGINEERING PROCESSES
Technical Paper Publication. DETC2017-67246

Robert E. Wendrich, *IDE at University of Twente, Enschede, Netherlands*

CONNECTING THE REAL-WORLD AND THE VIRTUAL WORLD THROUGH DYNAMIC ENVIRONMENT RENDERING
Technical Paper Publication. DETC2017-67738

Kevin Lesniak, *Pennsylvania State University, Butler, PA, USA,* ***Conrad Tucker,*** *Penn State University, State College, PA, USA*

DRIVING SIMULATOR SYSTEM TO EVALUATE DRIVER'S WORKLOAD USING ADAS IN DIFFERENT DRIVING CONTEXTS
Technical Paper Publication. DETC2017-67850

Giandomenico Caruso, Daniele Ruscio, Dedy Ariansyah, *Politecnico di Milano, Milan, Italy,* ***Monica Bordegoni,*** *Politecnico di Milano, Milan, Italy*

AN EXPLORATION STUDY FOR AUGMENTED AND VIRTUAL REALITY ENHANCING SITUATION AWARENESS FOR PLANT TELEANALYSIS
Technical Paper Publication. DETC2017-67790

Doris Aschenbrenner, Nicolas Maltry, *Zentrum für Telematik, Würzburg, Germany,* ***Klaus Schilling,*** *Julius-Maximilians-University Würzburg, Würzburg, Germany,* ***Jouke Verlinden,*** *TU Delft, CE Delft, Netherlands*

CIE-28-1: CIE PANEL: FROM A RESEARCHER/ TECHNOLOGY DEVELOPER TO AN ADVANCED TECHNOLOGY VISIONARY/ FACILITATOR – A PERSPECTIVE

CONCOURSE LEVEL, ROOM 3 **2:00PM–3:40PM**

Session Organizer: **Nien-hua Chao,** *USA, unknown, WA, USA*

Session Co-Organizer: **Catherine Florio,** *US, unknown, WA, USA*

AEROSPACE MATERIALS: DISRUPTING THE SUPPLY CHAIN
Panel. DETC2017-68573

Richard Vaia, *Air Force Research Laboratory, Wright, OH, USA*

ROBUST DESIGN FOR ADVANCED MICROELECTRONIC PACKAGES
Panel. DETC2017-68574

Eric Wong, *Raytheon Corp, Raytheon, DC, USA*

SMART GRID VIA DISTRIBUTED COUPLING OF SOLAR PHOTOVOLTAICS, ELECTRIC VEHICLES, AND, BATTERY ENERGY STORAGE SYSTEMS
Panel. DETC2017-68575

Rajit Gadh, *UCLA, Los Angeles, CA, USA*

TRENDS AND RECENT ADVANCES OF INDUSTRIAL BIG DATA ANALYTICS, AI, AND CYBER PHYSICAL SYSTEMS FOR SMART
Panel. DETC2017-68576

Jay Lee, *University of Cincinnati, Cincinnati, OH, USA*

A MACHINE TINKERER, A TECHNOCRAT, AN INVENTOR – JOURNEY OF ONE MECHANICAL ENGINEER
Panel. DETC2017-68577

Amit Bachi, *NRL, Washington, DC, USA*

DAC-1-1: ARTIFICIAL INTELLIGENCE AND COMPUTATIONAL SYNTHESIS

CONCOURSE LEVEL, ROOM 6 **2:00PM–3:40PM**

Session Organizer: **Ritesh Khire,** *8451 (wholly owned subsidiary of Kroger), New York, NY, USA*

Session Co-Organizer: **Matthew Campbell,** *Oregon State University, Corvallis, OR, USA*

BENCHMARKING THE PERFORMANCE OF A MACHINE LEARNING CLASSIFIER ENABLED MULTIOBJECTIVE GENETIC ALGORITHM ON SIX STANDARD TEST FUNCTIONS
Technical Paper Publication. DETC2017-68332

Kayla Zeliff, Walter Bennette, *Air Force Research Laboratory, Rome, NY, USA,* ***Scott Ferguson,*** *North Carolina State University, North Carolina, NC, USA*

TOWARDS A DISTRIBUTED MULTIAGENT-BASED DESIGN FRAMEWORK
Technical Paper Publication. DETC2017-68042

Daniel Hulse, Brandon Gigous, Kagan Tumer, *Oregon State University School of Mechanical, Industrial and Manufacturing Engineering, Corvallis, OR, USA,* ***Irem Tumer,*** *Dept. of Mechanical Engineering, Corvallis, OR, USA,* ***Christopher Hoyle,*** *Oregon State University, Corvallis, OR, USA*

AUTOMATED GRAPH GRAMMAR GENERATION FOR ENGINEERING DESIGN WITH FREQUENT PATTERN MINING
Technical Paper Publication. DETC2017-67520

Shraddha Sangelkar, *Penn State Erie, The Behrend College, Erie, PA, USA,* ***Professor Daniel McAdams,*** *Texas A&M University, College Station, TX, USA*

ANALOGY RETRIEVAL THROUGH TEXTUAL INFERENCE
Technical Paper Publication. DETC2017-67943

Roozbeh Sanaei, Wei Lu, *Singapore University of Technology and Design, Singapore,* ***Kevin Otto,*** *Aalto University, Espoo, Finland,* ***Lucienne Blessing,*** *Singapore University of Technology and Design, Singapore,* ***Kristin Wood,*** *Singapore University of Technology and Design, Singapore 487372, Singapore*

A DISTRIBUTED INTELLIGENCE APPROACH TO USING COLLABORATING UNMANNED AERIAL VEHICLES FOR OIL SPILL MAPPING
Technical Paper Publication. DETC2017-68320

Philip Odonkor, *University at Buffalo, Buffalo, NY, USA,* ***Zachary Ball,*** *University at Buffalo, SUNY, Amherst, NY, USA,* ***Souma Chowdhury,*** *University at Buffalo, Buffalo, NY, USA*

DAC-8-2: DESIGN FOR RESILIENCE AND FAILURE RECOVERY 2

[Cross-listed with CIE-29]

CONCOURSE LEVEL, ROOM 7 **2:00PM–3:40PM**

Session Organizer: **Zhimin Xi,** *University of Tennessee, Knoxville, Knoxville, TN, USA*

Session Co-Organizer: **Po Ting Lin,** *National Taiwan University of Science and Technology, Taipei, Taiwan*

OPTIMIZING RESILIENCE WHEN DESIGNING ENGINEERED SYSTEMS
Technical Paper Publication. DETC2017-68387
Chao Hu, Cameron A. MacKenzie, Iowa State University, Ames, IA, USA

SEQUENTIAL KRIGING OPTIMIZATION FOR TIME-VARIANT RELIABILITY-BASED DESIGN INVOLVING STOCHASTIC PROCESSES
Technical Paper Publication. DETC2017-67426

Mingyang Li, Zequn Wang, *MTU, Houghton, MI, USA*

BAYESIAN NETWORK LEARNING FOR UNCERTAINTY QUANTIFICATION
Technical Paper Publication. DETC2017-68187

Zhen Hu, Sankaran Mahadevan, *Vanderbilt University, Nashville, TN, USA*

CONCEPT DRIFT AND EVOLUTION DETECTION IN FUSION DIAGNOSIS WITH EVOLVING DATA STREAMS
Technical Paper Publication. DETC2017-68373

Amirmahyar Abdolsamadi, *Wichita State University, Wichita, KS, USA,* ***Pingfeng Wang,*** *Industrial And Manufacturing Engineering, Wichita, KS, USA*

DAC-10-1: DESIGN OF COMPLEX SYSTEMS

CONCOURSE LEVEL, ROOM 8 **2:00PM–3:40PM**

Session Organizer: **Beshoy Morkos,** *Florida Institute of Technology, Florida, FL, USA*

Session Co-Organizer: **Carolyn Seepersad,** *University of Texas at Austin, Austin, TX, USA*

FORMULATING ASSEMBLY PROCEDURES WHILE DEVELOPING COMPLICATE PRODUCTS: A REVIEW FOR THE STATE-OF-THE-ART TECHNOLOGY
Technical Paper Publication. DETC2017-67661

Li Young, *Advanced Intelligent Machine, Inc., Green Brook, NJ, USA,* ***Zetao Yu,*** *Tennessee Technological University, Cookeville, TN, USA,* ***Kwun-Lon Ting,*** *Tennessee Technological University, Cookeville, TN, USA*

CORRELATING INTEGRATIVE COMPLEXITY WITH SYSTEM MODULARITY
Technical Paper Publication. DETC2017-67254

Kaushik Sinha, *MIT, Westborough, MA, USA,* ***Eun Suk Suh,*** *Seoul National University, Seoul, Korea (Republic),* ***Olivier De Weck,*** *MIT, Cambridge, MA, USA*

GAMING THE SYSTEM: AN AGENT-BASED MODEL OF ESTIMATION STRATEGIES AND THEIR EFFECTS ON SYSTEM PERFORMANCE
Technical Paper Publication. DETC2017-68202

John Meluso, *University of Michigan, Ann Arbor, MI, USA,* ***Jesse Austin-Breneman,*** *University of Michigan, Ann Arbor, Ann Arbor, MI, USA*

DUAL-SAMPLING BASED CO-KRIGING METHOD FOR DESIGN OPTIMIZATION PROBLEMS WITH MULTI-FIDELITY MODELS
Technical Paper Publication. DETC2017-67264

Renhe Shi, Li Liu, Teng Long, Bin Yuan, Xin Li, *Beijing Institute of Technology, Beijing, China*

THE POTENTIAL EFFECTS ON DESIGN OF INCREASED PREVALENCE OF OBESITY IN US CHILDREN
Technical Paper Publication. DETC2017-68292

Harsimran Thind, Matthew Parkinson, *Penn State University, University Park, PA, USA*

DEC-4-1: FABRICATION AND MAKING IN DESIGN EDUCATION

EXHIBIT HALL LEVEL, ROOM 23 **2:00PM–3:40PM**

Session Organizer: **Robert Nagel,** *James Madison University, Harrisonburg, VA, USA*

Session Co-Organizer: **Daniela Faas,** *Olin College of Engineering, Needham, MA, USA*

DESIGN OF A 3D PRINTABLE MECHANICAL TIME SIMULATING SOLAR SYSTEM FOR USE IN STEM EDUCATION
Technical Paper Publication. DETC2017-68144

Mark Moffett, *Florida Institute of Technology, Toledo, OH, USA,* ***Pierre Larochelle,*** *Florida Institute of Technology, Melbourne, FL, USA*

A QUALITATIVE APPROACH TO STUDYING THE INTERPLAY BETWEEN EXPERTISE, CREATIVITY, AND LEARNING IN UNIVERSITY MAKERSPACES
Technical Paper Publication. DETC2017-68256

Megan Tomko, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Melissa Alemán, Robert Nagel,*** *James Madison University, Harrisonburg, VA, USA,* ***Julie Linsey,*** *Georgia Institute of Technology, Atlanta, GA, USA*

DOES DESIGNING FOR ADDITIVE MANUFACTURING HELP US BE MORE CREATIVE? AN EXPLORATION IN ENGINEERING DESIGN EDUCATION
Technical Paper Publication. DETC2017-68274

Swapnil Sinha, Hong-En Chen, Nicholas Meisel, Scarlett Miller, *The Pennsylvania State University, University Park, PA, USA*

AN INVESTIGATION INTO THE DRIVING FACTORS OF CREATIVITY IN DESIGN FOR ADDITIVE MANUFACTURING
Technical Paper Publication. DETC2017-68395

Michael Barclift, *Penn State University, State College, PA, USA,* ***Maria Alessandra Nusiner,*** *Penn State University, Fort Lauderdale, FL, USA,* ***Scarlett Miller,*** *The Pennsylvania State University, University Park, PA, USA,* ***Timothy W. Simpson,*** *Penn State University, University Park, PA, USA*

PERCEPTIONS OF PROTOTYPES: PILOT STUDY COMPARING STUDENTS AND PROFESSIONALS
Technical Paper Publication. DETC2017-68117

Carlye Lauff, *University of Colorado at Boulder, Boulder, CO, USA,* ***Daria Kotys-Schwartz,*** *University of Colorado at Boulder, Lakewood, CO, USA,* ***Mark Rentschler,*** *University of Colorado at Boulder, Boulder, CO, USA*

DFMLC-13-1: LIGHTNING TALKS – THE SUSTAINABLE DESIGN FRONTIER

EXHIBIT HALL LEVEL, ROOM 22 **2:00PM–3:40PM**

Session Organizer: **Deborah Thurston,** *University of Illinois at Urbana-Champaign, Chicago, CA, USA*

Session Co-Organizer: **Sara Behdad,** *University at Buffalo, SUNY, New York, United Kingdom*

A LIFE CYCLE MODEL TO ASSESS COSTS AND ENVIRONMENTAL IMPACTS OF DIFFERENT MARITIME VESSEL TYPOLOGIES

Steve Manieri, *Universita' Degli Studi Di Parma*

DESIGN OF AN INTEGRATED COTTON PICKING SYSTEM FOR SMALL-SCALE INDIAN AGRICULTURE

Amos Winter, Guillermo F. Diaz Lankenau, *MIT*

AN EXPERIMENTAL STUDY OF ADDITIVE MANUFACTURING ENERGY CONSUMPTION

Jungfeng Ma, *Mississippi State University*

IMPLEMENTATION OF AN OBJECT-ORIENTED LIFE CYCLE ASSESSMENT FRAMEWORK USING FUNCTIONAL ANALYSIS AND SYSTEMS ENGINEERING PRINCIPLES

Marcos Esterman, *Rochester Institute of Technology*

FINDING CAUSALITY IN SOCIO-TECHNICAL SYSTEMS: A COMPARISON OF BAYESIAN NETWORK STRUCTURE LEARNING ALGORITHMS

Cassandra Telenko, *Georgia Tech*

DESIGN OF AN AGENT-BASED TECHNIQUE FOR CONTROLLING INTERCONNECTED DISTRIBUTED ENERGY RESOURCE TRANSACTIONS

Samantha Janko, *Arizona State University*

A GUIDED PARTICLE SWARM OPTIMIZER FOR DISTRIBUTED OPERATION OF ELECTRIC VEHICLE TO BUILDING INTEGRATION

Mengqi Hu, *University of Illinois at Chicago*

ORIGINS OF DESIGN PRINCIPLES: THE CASE OF NUCLEAR REACTOR DESIGN PROJECTS

Aditi Verma, *MIT*

FLEXIBILITY AND REAL OPTIONS ANALYSIS IN DESIGN FOR LONG TERM GENERATION EXPANSION PLANNING OF POWER GRID SYSTEMS

Michel-Alexandre Cardin, *National University of Singapore*

A SIMPLE STARTING POINT FOR DESIGNING FOR AND/OR ASSESSING THE SOCIAL IMPACT OF PRODUCTS

Chris Mattson, *Brigham Young University*

TOWARDS A UNIVERSAL SOCIAL IMPACT METRIC FOR ENGINEERED PRODUCTS THAT ALLEVIATE POVERTY

Chris Mattson, *Brigham Young University*

DTM-5-1: HUMAN BEHAVIOR IN DESIGN I

EXHIBIT HALL LEVEL, ROOM 20 **2:00PM–3:40PM**

Session Organizer: **Joshua Summers,** *Clemson University, South Carolina, SC, USA*

Session Co-Organizer: **Kristin Wood,** *Singapore University of Technology and Design, Singapore*

DESIGN THINKING AT THE CORE: LEARN NEW WAYS OF THINKING AND DOING BY REFRAMING
Technical Paper Publication. DETC2017-67172

Xiao Ge, Larry Leifer, *Stanford University, Stanford, CA, USA*

RISKY BUSINESS: THE DRIVING FACTORS OF CREATIVE RISK TAKING ATTITUDES IN ENGINEERING DESIGN INDUSTRY
Technical Paper Publication. DETC2017-67799

Xuan Zheng, *The Pennsylvania State University, University Park, PA, USA,* ***Scarlett Miller,*** *The Pennsylvania State University, University Park, PA, USA*

INTEGRATING DESIGN AND OPTIMIZATION TOOLS: A DESIGNER CENTERED STUDY
Technical Paper Publication. DETC2017-68307

Edward Burnell, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Michael Stern,*** *Massachusetts Institute of Technology – Lincoln Labs, Lexington, MA, USA,* ***Ana Flooks, Maria Yang,*** *MIT, Cambridge, MA, USA*

DESIGN INNOVATION: A STUDY OF IMPACT ON PRACTICE
Technical Paper Publication. DETC2017-68382

Bradley Camburn, *Singapore University of Technology and Design, Singapore,* ***Jan Auernhammer, Karen Sng,*** *SUTD-MIT International Design Centre, Singapore,* ***Paul Mignone,*** *Singapore University of Technology and Design, Singapore,* ***Ryan Arlitt,*** *Oregon State University, Corvallis, OR, USA,* ***K. Blake Perez, Zack Huang, Subarna Basnet,*** *SUTD-MIT International Design Centre, Singapore, Lucienne Blessing,* ***Kristin Wood,*** *Singapore University of Technology and Design, Singapore, Singapore*

FUNCTION MODELING: COMPARISON OF CHAINING METHODS USING PROTOCOL STUDY AND DESIGNER STUDY
Technical Paper Publication. DETC2017-68420

Apurva Patel, William Kramer, Michelle Flynn, *Clemson University, Clemson, SC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA,* ***Marissa Shuffler Porter,*** *Clemson University, Clemson, SC, USA*

MR-1-3: PLANAR MECHANISMS

EXHIBIT HALL LEVEL, ROOM 10 **2:00PM–3:40PM**

Session Organizer: **Andrew P. Murray,** *University of Dayton, Dayton, OH, USA*

Session Co-Organizer: **Jingjun Yu,** *Beihang University/Robotics Institute, Beijing, China*

THE DESIGN AND MANUFACTURE OF A GEAR-COUPLED SERIAL CHAIN TO TRACE THE BUTTERFLY CURVE
Technical Paper Publication. DETC2017-68388

Yang Liu, Peter Lee-Shien Wang, J. Michael McCarthy, *University of California, Irvine, Irvine, CA, USA*

A TASK-DRIVEN APPROACH TO OPTIMAL SYNTHESIS OF PLANAR FOUR-BAR LINKAGES FOR EXTENDED BURMESTER PROBLEM
Technical Paper Publication. DETC2017-67469

Shrinath Deshpande, Anurag Purwar, *Stony Brook University, Stony Brook, NY, USA*

PLANAR LINKAGE SYNTHESIS FOR MIXED MOTION, PATH AND FUNCTION GENERATION USING POLES AND ROTATION ANGLES
Technical Paper Publication. DETC2017-67565

Ronald Zimmerman II, *Magna Seating, White Lake, MI, USA*

ELEMENT BASED FORCE ANALYSIS OF A SINGLE INPUT-MULTIPLE OUTPUT LINKAGE SYSTEM
Technical Paper Publication. DETC2017-67468

Cong Zhu Sun, *Ryerson University, Toronto, ON, Canada,* ***Fengfeng Xi,*** *Ryerson University, Toronto, ON, Canada,* ***Amin Moosavian,*** *Ryerson University, Toronto, ON, Canada,* ***Daniel J. Inman,*** *University of Michigan, Ann Arbor, MI, USA*

PROBABILISTIC ANALYSIS OF A METAMORPHIC MECHANISM BASED ON A GLOBAL SENSITIVITY ANALYSIS: A PRELIMINARY STUDY
Technical Paper Publication. DETC2017-67322

Sarah C. Baxter, *University of St. Thomas, Saint Paul, MN, USA,* ***Philip Voglewede,*** *Marquette University, Milwaukee, WI, USA*

MR-4-3: FOLDING PATTERNS

EXHIBIT HALL LEVEL, ROOM 9 **2:00PM–3:40PM**

Session Organizer: **Spencer P. Magleby,** *Brigham Young University, Provo, UT, USA*

Session Co-Organizer: **Jyh-Ming Lien,** *George Mason University, Fairfax, VA, USA*

SELF-LOCKING ORIGAMI STRUCTURES AND LOCKING-INDUCED PIECEWISE STIFFNESS
Technical Paper Publication. DETC2017-67197

Hongbin Fang, Shih-Cheng A. Chu, *University of Michigan, Ann Arbor, MI, USA,* ***Kon-Well Wang,*** *University of Michigan, Ann Arbor, MI, USA*

FINDING RIGID BODY MODES OF RIGID-FOLDABLE ORIGAMI THROUGH THE SIMULATION OF VERTEX MOTION
Technical Paper Publication. DETC2017-67802

Luca Zimmermann, *ETH Zürich, Zürich, Switzerland,* ***Tino Stankovic,*** *Swiss Federal Institute of Technology Zurich (ETHZ), Zurich, Switzerland,* ***Kristina Shea,*** *Swiss Federal Institute of Technology ETH Zurich, Zurich, Switzerland*

RIGID FOLDABILITY OF TRIANGLE-TWIST ORIGAMI PATTERN AND ITS DERIVED 6R LINKAGE
Technical Paper Publication. DETC2017-68063

Rui Peng, Jiayao Ma, Yan Chen, *Tianjin University, Tianjin, China*

ANALYSIS OF CROSS FOLDING AN ELASTIC SHEET
Technical Paper Publication. DETC2017-67388

Degao Hou, Jiayao Ma, Yan Chen, *Tianjin University, Tianjin, China,* ***Zhong You,*** *University of Oxford, Oxford, United Kingdom*

NORIGAMI CREASE PATTERN MODEL DESIGN BASED ON SURFACES OF REVOLUTION
Student Competition Paper. DETC2017-67821

Julian A. Romero, *Meiji University, Kawasaki, Kanagawa, Japan,* ***Luis A. Diago,*** *Interlocus Inc., Yokohama, Kanagawa, Japan,* ***Ichiro Hagiwara,*** *Meiji University, Kanagawa 247, Tokyo, Japan*

MR-8-3: GRASPING AND HUMAN-CENTERED APPLICATIONS

EXHIBIT HALL LEVEL, ROOM 11 **2:00PM–3:40PM**

Session Organizer: **Nina Robson,** *California State University, Fullerton, Fullerton, CA, USA*

Session Co-Organizer: **Dennis Hong,** *University of California, Los Angeles, Los Angeles, CA, USA*

DESIGN AND TESTING OF A PROSTHETIC FOOT PROTOTYPE WITH INTERCHANGEABLE CUSTOM ROTATIONAL SPRINGS TO ADJUST ANKLE STIFFNESS FOR EVALUATING LOWER LEG TRAJECTORY ERROR, AN OPTIMIZATION METRIC FOR PROSTHETIC FEET
Technical Paper Publication. DETC2017-67820
****Engineering For Global Development Paper****

Victor Prost, Kathryn Olesnavage, Amos Winter, *MIT, Cambridge, MA, USA*

DESIGN OPTIMIZATION OF A PRISMATIC-REVOLUTE-REVOLUTE JOINT HAND FOR GRASPING FROM UNCONSTRAINED VEHICLES
Technical Paper Publication. DETC2017-67222

Spencer Backus, Aaron M. Dollar, *Yale University, New Haven, CT, USA*

DEVELOPMENT OF MULTI JOINT GRIPPER THAT ACHIEVES TRANSITION FROM PINCHING TO ENVELOPE GRASPING WITH SIMPLE CONTROL
Technical Paper Publication. DETC2017-67666

Takumi Tamamoto, *Toyama Prefectural University, Toyama, Japan,* ***Soichiro Nomura, Keita Takeuchi, Koichi Koganezawa,*** *Tokai University, Kanagawa, Japan*

DESIGN AND COMPARATIVE ANALYSIS OF LINEAR GUIDES FOR REFRESHABLE BRAILLE DISPLAYS
Technical Paper Publication. DETC2017-68308

Varan Gupta, *Indian Institute of Technology Delhi, New Delhi, Delhi, India,* ***Pulkit Sapra,*** *Indian Institute of Technology, Delhi, Faridabad, Haryana, India,* ***Suman Muralikrishnan, M. Balakrishnan,*** *Indian Institute of Technology Delhi, New Delhi, Delhi, India,* ***P.V.M. Rao,*** *IIT Delhi, New Delhi, India*

ANALYSIS OF DIFFERENTIAL MECHANISMS FOR A ROBOTIC HEAD STABILIZATION SYSTEM
Technical Paper Publication. DETC2017-67371

Adam Williams, Wael Saab, Pinhas Ben-Tzvi, *Virginia Tech, Blacksburg, VA, USA*

MNS-6-1: MEMS ACTUATORS, SWITCHES

EXHIBIT HALL LEVEL, ROOM 13 **2:00PM–3:40PM**

Session Organizer: **Teresa Ryan,** *East Carolina University, Greenville, NC, USA*

Session Co-Organizer: **Sai Tej Paruchuri,** *Virginia Tech, Blacksburg, VA, USA*

ELECTROSTATICALLY INDUCED ELASTO-PLASTIC BEHAVIOR OF MICRO STRINGS

Technical Presentation. DETC2017-67359

Rivka Gilat, *Ariel University, Ariel, Israel,* ***Slava Krylov,*** *Tel Aviv University, Tel Aviv, Israel*

VIBRATION ANALYSIS OF V-SHAPED BEAM ELECTROTHERMAL MICROACTUATORS

Technical Paper Publication. DETC2017-67486

Zhuo Zhang, Yueqing Yu, *Beijing University of Technology, Beijing, China,* ***Xuping Zhang,*** *Aarhus University, Aarhus, Denmark*

ELECTROTHERMALLY ACTUATED MICROBEAMS WITH VARYING STIFFNESS

Technical Paper Publication. DETC2017-67517

Sherif Tella, Nouha Alcheikh, *King Abdullah University of Science and Technology, Jeddah, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

RESONANT-MODE DYNAMICS OF A LARGE DISPLACEMENT THIN-FILM PIEZOELECTRIC MICROACTUATOR FOR ENDOMICROSCOPY

Technical Presentation. DETC2017-68522

Jongsoo Choi, Xiyu Duan, Haijun Li, Thomas D. Wang, Kenn Oldham, *University of Michigan, Ann Arbor, MI, USA*

DESIGN OF A TWO-TERMINAL BISTABLE MICROMACHINED SWITCH

Technical Paper Publication. DETC2017-68417

Nitish Satya Murthy, *Indian Institute of Science, Bengaluru, India,* ***Safvan Palathingal,*** *Indian Institute of Science, Bangalore, India,* ***M. S. Giridhar,*** *Indian Space Research Organization, Bengaluru, India,* ***GK Ananthasuresh,*** *Indian Institute of Science, Bangalore, Bangalore, Karnataka, India*

MESA-1-1: AUTONOMOUS SYSTEMS AND AMBIENT INTELLIGENCE (ASAI)

EXHIBIT HALL LEVEL, ROOM 14 **2:00PM–3:40PM**

Session Organizer: **Adriano Mancini,** *Universit Politecnica Delle Marche, Ancona, Italy*

Session Co-Organizer: **Alessandro Freddi,** *Università degli Studi eCampus, Novedrate, CO, Italy*

DESIGN AND APPLICATION OF FRACTIONAL ORDER PID CONTROLLER IN GRID-CONNECTED INVERTER SYSTEM

Technical Paper Publication. DETC2017-67355

Pan Zhifeng, Wang XiaoHong, *South China University of Technology, Guangzhou, China,* ***Hoang Thi Thu Giang,*** *Thai nguyen University of Technology, Guangzhou,* ***China, Luo Ying,*** *Huazhong University of Science and Technology, Wuhan, China,* ***Chen Yangquan,*** *University of California, Merced, CA, USA,* ***Tian Lianfang,*** *South China University of Technology, Guangzhou, China*

A CLINICAL DECISION SUPPORT SYSTEM FOR CHRONIC VENOUS INSUFFICIENCY

Technical Paper Publication. DETC2017-68016

Chiara Calamanti, Annalisa Cenci, Michele Bernardini, *Università Politecnica delle Marche, Ancona, Italy,* ***Emanuele Frontoni,*** *Dipartimento di Ingegneria dell'Informazione–DII, Ancona, Ancona, Italy,* ***Primo Zingaretti,*** *Università Politecnica delle Marche, An-cona, Italy*

ACTIVE FAULT TOLERANT CONTROL OF REMOTELY OPERATED VEHICLES VIA CONTROL EFFORT REDISTRIBUTION

Technical Paper Publication. DETC2017-67760

Andrea Monteriù, Alessandro Baldini, Lucio Ciabattoni, *Università Politecnica delle Marche, Ancona, AN, Italy,* ***Antonio Fasano,*** *Università Campus Bio-medico, Roma, RM, Italy,* ***Riccardo Felicetti, Francesco Ferracuti,*** *Università Politecnica delle Marche, Ancona, AN, Italy,* ***Alessandro Freddi,*** *Università degli Studi eCampus, Novedrate, CO, Italy*

VEHICLE TRACKING AND CLASSIFICATION FROM VIDEOS UNDER ILLUMINATION CHANGES AND OCCLUSIONS

Technical Paper Publication. DETC2017-68004

Mirco Sturari, Luca Esposto, *Università Politecnica delle Marche, Ancona, Italy,* ***Christian Spurio,*** *Università Politecnica delle Marche, Italy,* ***Domenico Tigano,*** *Università Politecnica delle Marche, Ancona, Italy,* ***Adriano Mancini,*** *Universit Politecnica Delle Marche, Ancona, Italy,* ***Primo Zingaretti,*** *Università Politecnica delle Marche, Ancona, Italy*

MESA-15-1: SENSORS AND ACTUATORS (SA)

EXHIBIT HALL LEVEL, ROOM 19 **2:00PM–3:40PM**

Session Organizer: **Ja Choon Koo,** *Sungkyunkwan University, Suwon, Korea (Republic)*

Session Co-Organizer: **Harry H. Cheng,** *University of California, Davis, Davis, CA, USA*

REAL-TIME HIGH BANDWIDTH FEEDFORWARD POSITION CONTROL OF ELECTRO-HYDRAULIC ACTUATOR USING NON-MINIMUM PHASE INVERSE MODEL

Technical Paper Publication. DETC2017-67628

Kyeong Ha Lee, Seung Guk Baek, Ja Choon Koo, *Sungkyunkwan University, Suwon, Korea (Republic)*

OPTIMAL DESIGN OF STRETCHABLE ELECTRONICS WITH THE CONSIDERATION OF RESPONSE VARIABILITY

Technical Paper Publication. DETC2017-67642

Sungkun Hwang, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Seung-Kyum Choi,*** *Georgia Tech, Atlanta, GA, USA*

A NOVEL THRESHOLD PRESSURE SENSOR BASED ON NONLINEAR DYNAMICS OF MEMS ARCHES

Technical Paper Publication. DETC2017-67874

Mohammad Hasan, Fadi Alsaleem, *University of Nebraska – Lincoln, Omaha, NE, USA,* ***Hassen Ouakad,*** *King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

VOICE RECOGNITION FOR STEM EDUCATION USING ROBOTICS

Technical Paper Publication. DETC2017-68368

Shubo Chen, *University of California, Davis, Davis, CA, USA,* ***Binsen Qian,*** *University of California at Davis, Davis, CA, USA,* ***Harry H. Cheng,*** *University of California, Davis, Davis, CA, USA*

MSNDC-5-1: NONLINEAR DYNAMICS OF STRUCTURES I

[Cross-listed with VIB-4]

BALLROOM LEVEL, ROOM 25B **2:00PM–3:40PM**

Session Organizer: **Laura Ruzziconi,** *Universita Politecnica delle Marche, Ancona, Italy*

Session Co-Organizer: **Enrico Babilio,** *Universita degli Studi di Napoli Federico II, Napoli, Italy*

AN ELECTRICALLY ACTUATED MICROBEAM-BASED MEMS DEVICE: EXPERIMENTAL AND THEORETICAL INVESTIGATION

Technical Paper Publication. DETC2017-67579

Laura Ruzziconi, *Polytechnic University of Marche, Ancona, Italy,* ***Nizar R. Jaber,*** *King Abdullah University of Science & Technology, Thuwal, Saudi Arabia,* ***Lakshmoji Kosuru,*** *King Abdullah University of Science and Technology, Thuwal, Saudi Arabia,* ***Mohammed Bellaredj,*** *King Abdullah University of Science and Technology KAUST, Thuwal, Saudi Arabia,* ***Stefano Lenci,*** *Polytechnic University of Marche, Ancona, Italy,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

EFFECT OF INITIAL CURVATURE ON THE STATIC AND DYNAMIC BEHAVIOR OF MEMS RESONATORS

Technical Paper Publication. DETC2017-67791

Amal Z. Hajjaj, *King Abdullah University of Science and Technology, Makkah Province, Saudi Arabia,* ***Nouha Alcheikh,*** *King Abdullah University of Science and Technology, Jeddah, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

AMPLITUDE-DEPENDENT STIFFNESS METHOD FOR STUDYING FREQUENCY AND DAMPING VARIATIONS IN NONLINEAR DYNAMICAL SYSTEMS

Technical Paper Publication. DETC2017-67918

Mohammad Al-Shudeifat, *Khalifa University, Abu Dhabi, United Arab Emir.*

MODELING NONLINEAR DYNAMICS OF BIOLOGICAL FILAMENTS IN CONTINUUM LIMIT

Technical Presentation. DETC2017-68530

Ghazaale Leylaz Mehrabadi, Anupam Mishra, Soheil Fatehiboroujeni, *University of California Merced, Merced, CA, USA,* ***Sachin Goyal,*** *University of California At Merced, Merced, CA, USA*

DYNAMIC MODELING OF BEAM TO PULLEY CONTACT

Technical Presentation. DETC2017-67420

Ivo Steinbrecher, *Johannes Kepler Universität Linz, Linz, Upper Austria, Austria,* ***Alexander Humer,*** *Johannes Kepler University, Linz, Austria*

MSNDC-6-2: TIME-VARYING AND TIME-DELAY SYSTEMS II

[Cross-listed with VIB-16]

BALLROOM LEVEL, ROOM 26C **2:00PM–3:40PM**

Session Organizer: **Yu Guo,** *Midwestern State University, Wichita Falls, TX, USA*

STEADY-STATE RESPONSES OF NONAUTONOMOUS NONLINEAR TIME-DELAY SYSTEMS WITH THE INCREMENTAL HARMONIC BALANCE METHOD AND STABILITY ANALYSIS WITH THE SPECTRAL METHOD USING CHEBYSHEV POLYNOMIALS

Technical Paper Publication. DETC2017-67260

Xuefeng Wang, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Xi Zhao,*** *West Virginia State University, Institute, WV, USA*

PERIOD MOTIONS AND LIMIT CYCLE IN A PERIODICALLY FORCED, SELF-EXCITED NONLINEAR OSCILLATOR

Technical Paper Publication. DETC2017-67323

Bo Yu, *University of Wisconsin-Platteville, Platteville, WI, USA,* ***Albert Luo,*** *Southern Illinois University, Edwardsville, IL, USA*

PERIODIC MOTIONS IN A COUPLED VAN DER POL-DUFFING OSCILLATOR

Technical Paper Publication. DETC2017-67563

Yeyin Xu, *Southern Illinois University Edwardsville, Edwardsville, IN, USA,* ***Albert Luo,*** *Southern Illinois University, Edwardsville, IL, USA*

AN APPROXIMATE ANALYSIS OF QUASI-PERIODIC SYSTEMS VIA FLOQUET THEORY
Technical Paper Publication. DETC2017-68041

Ashu Sharma, *Auburn University, Auburn, AL, USA,* ***Subhash Sinha,*** *Auburn University, Auburn, AL, USA*

FRACTIONAL CHEBYSHEV COLLOCATION METHOD FOR SOLVING LINEAR FRACTIONAL-ORDER DELAY-DIFFERENTIAL EQUATIONS
Student Competition Paper. DETC2017-68333

Arman Dabiri, Eric Butcher, *University of Arizona, Tucson, AZ, USA*

PTG-1-3: GEAR GEOMETRY (3)

EXHIBIT HALL LEVEL, ROOM 16 **2:00PM–3:40PM**

Session Organizer: **Hai Xu,** *General Motors Company, Milford, MI, USA*

Session Co-Organizer: **Alexander Kapelevich,** *AKGears, LLC, Shoreview, MN, USA*

MATHEMATICAL MODELING AND DYNAMIC CONTACT ANALYSIS OF BEVELOID GEAR PAIRS IN MARINE GEARBOX WITH SMALL SHAFT ANGLE
Technical Paper Publication. DETC2017-67073

Tengjiao Lin, Hang Li, Liu Wen, Jun Zhao, *Chongqing University, Chongqing, Chongqing, China*

RESEARCH ON A GENERATING METHOD OF SPIRAL FLUTES OF HOURGLASS WORM GEAR HOB
Technical Paper Publication. DETC2017-67053

Yang Jie, Li Haitao, Rui Chengjie, Wei Wenjun, Dong Xuezhu, *College of Engineering,China Agricultural University, Beijing, China, China*

RESEARCH ON INCOMPLETE DESIGN AND GENERATING THEORY OF THE RELIEF SURFACES OF DUAL-CONE DOUBLE ENVELOPING HOURGLASS WORM GEAR HOB
Technical Paper Publication. DETC2017-67051

Rui Chengjie, Li Haitao, Yang Jie, Wei Wenjun, Dong Xuezhu, *College of Engineering,China Agricultural University, Beijing, China, China*

GLOBAL CHARACTERISTICS OF MESHING LIMIT LINE OF CONICAL SURFACE ENVELOPING SPIROID DRIVE
Technical Paper Publication. DETC2017-67408

Yaping Zhao, *Northeastern University, Shenyang Liaoning, China*

PTG-3-3: GEAR DYNAMICS AND NOISE (3)

EXHIBIT HALL LEVEL, ROOM 15 **2:00PM–3:40PM**

Session Organizer: **Ignacio Gonzalez-Perez,** *Polytechnic University of Cartagena, Cartagena, Spain*

Session Co-Organizer: **Yaping Zhao,** *Northeastern University, Shenyang Liaoning, China*

EFFECTS OF CUMULATIVE PITCH ERROR ON DYNAMIC RESPONSE OF GEAR TRANSMISSION
Technical Presentation. DETC2017-67093

Lan Liu, Huan Song, Liyan Wu, *Shaanxi Engineering Laboratory for Transmissions and Controls, Northwestern Polytechnical University, Xi'an, Shaanxi, China,* ***Geng Liu,*** *Northwestern Polytechnical University, Xi'an, Shannxi, China,* ***Yang Jiao,*** *Shaanxi Engineering Laboratory for Transmissions and Controls,Northwestern Polytechnical University, Xi'an, Shaanxi, China*

VIBRATION CHARACTERISTICS OF FRICTION PLATE OF A 6-SPEED PLANETARY GEAR TRAIN BASE ON MULTI-BODY DYNAMIC MODEL
Technical Paper Publication. DETC2017-67045

Yimin Shao, Tinghui Su, *Chongqing University, Chongqing, China,* ***Zheng Cao,*** *Chongqing University, Chonqing, Chonqing, China,* ***Liming Wang,*** *Chongqing University, Chongqing, Chongqing, China,* ***Hongwu Li, Jin Xu, Yan Cheng,*** *China North Vehicle Research Institute, Beijing, China*

VIBRATION OF A SPINNING PLANETARY GEAR WITH A DEFORMABLE, COMPLIANT RING GEAR INCLUDING STEADY DEFORMATION
Technical Presentation. DETC2017-68494

Chenxin Wang, Robert Parker, *Virginia Tech, Blacksburg, VA, USA*

A METHOD FOR THE OPTIMAL DESIGN OF SPLIT RING DAMPERS FOR AVIATION GEARS
Technical Paper Publication. DETC2017-67231

Ye Hang, Wang Yanrong, Jiang Xianghua, *Beihang University, Beijing, China*

HEAVY DUTY VEHICLE REAR AXLE WHINE NOISE PREDICTION
Technical Presentation. DETC2017-67763

Mustafa Yildirim, *Ford Otosan, Istanbul, Turkey*

VIB-2-3: STRUCTURES AND CONTINUOUS SYSTEMS III

BALLROOM LEVEL, ROOM 25A **2:00PM–3:40PM**

Session Organizer: **Marc P. Mignolet,** *Arizona State University, Tempe, AZ, USA*

Session Co-Organizer: **Kedar S. Vaidya,** *Virginia Tech, Blacksburg, VA, USA*

SEMI-ANALYTICAL METHOD FOR THE VIBRATION OF AXISYMMETRIC, COUPLED SPINNING RINGS
Technical Presentation. DETC2017-68489

Kedar S. Vaidya, Robert Parker, *Virginia Tech, Blacksburg, VA, USA*

COMPONENT-CENTRIC REDUCED ORDER MODELS FOR THE LINEAR AND NONLINEAR DYNAMIC RESPONSE OF MULTI-BAY STRUCTURES
Technical Presentation. DETC2017-67956

Yuting Wang, *Arizona State University, MESA, AZ, USA,* ***Marc P. Mignolet,*** *Arizona State University, Tempe, AZ, USA*

FREQUENCY RESPONSE OF PARAMETRIC RESONANCE OF DOUBLE WALL CARBON NANOTUBE UNDER ELECTROSTATIC ACTUATION
Technical Paper Publication. DETC2017-67367

Dumitru Caruntu, Ezequiel Juarez, *University of Texas Rio Grande Valley, Edinburg, TX, USA*

VIB-3-1: ENERGY HARVESTING I

[Cross-listed with MSNDC-2]

BALLROOM LEVEL, ROOM 26B **2:00PM–3:40PM**

Session Organizer: **Lei Zuo,** *Virginia Tech, Blacksburg, VA, USA*

Session Co-Organizer: **Alper Erturk,** *Georgia Institute of Technology, Atlanta, GA, USA*

PVDF-BASED FLEXIBLE ENERGY HARVESTING FROM HUMAN MOTION
Technical Presentation. DETC2017-67694

Junyi Cao, *Xi'an Jiaotong University, Xian, China,* ***Yulong Cai,*** *Xi'an Jiaotong University, Xi'an, China*

ON IMPROVEMENT OF OPERATION BANDWIDTH OF DUFFING-LIKE VIBRATION-BASED HARVESTERS USING A MECHANICAL MOTION RECTIFIER
Technical Paper Publication. DETC2017-68029

Yue Yuan, Mingyi Liu, *Virginia Tech, Blacksburg, VA, USA,* ***Wei Che Tai,*** *Virginia Tech, Blacksburg, VA, USA,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

MODELING AND ANALYSIS OF A GYROSCOPIC VIBRATION ENERGY HARVESTER
Technical Presentation. DETC2017-68238

Thang Tran, *Southern Illinois University Carbondale, Carbondale, IL, USA,* ***Tan Chai,*** *Southern Illinois University, Carbondale, IL, USA,* ***Christopher G. Cooley,*** *Southern Illinois University Carbondale, Carbondale, IL, USA*

AN ELECTROMAGNETIC ENERGY HARVESTER FOR ROTATIONAL APPLICATIONS
Technical Paper Publication. DETC2017-67960

Ben Gunn, Stephanos Theodossiades, Steve J. Rothberg, *Loughborough University, Loughborough, Leicestershire, United Kingdom,* ***Tim Saunders,*** *Ford Motor Company, Laindon, United Kingdom*

DESIGN UNDER UNCERTAINTY FOR A PIEZOELECTRIC ENERGY HARVESTER TO POWER A TIRE PRESSURE MONITORING SYSTEM
Technical Paper Publication. DETC2017-67522

Amin Toghi Eshghi, Soobum Lee, *UMBC, Baltimore, MD, USA,* ***Young-Cheol Kim,*** *Korea institute of Machinery & Materials, Daejeon, Korea (Republic)*

VIB-10-1: INDUSTRIAL APPLICATIONS

[Cross-listed with MSNDC-10]

BALLROOM LEVEL, ROOM 26A **2:00PM–3:40PM**

Session Organizer: **Brian Olson,** *The Johns Hopkins University Applied Physics Lab, Laurel, MD, USA*

COMPUTATIONAL MODAL ANALYSIS OF A TWIN-ENGINE REAR FUSELAGE MOUNTED AIRCRAFT SUPPORT FRAME
Technical Paper Publication. DETC2017-67365

Braden T. Warwick, Chris K. Mechefske, Il Yong Kim, *Queen's University, Kingston, ON, Canada*

EXPERIMENTAL MODAL ANALYSIS OF A HALF-SCALE MODEL TWIN-ENGINE AIRCRAFT REAR FUSELAGE ENGINE MOUNT SUPPORT FRAME
Technical Paper Publication. DETC2017-67389

Diego A. Chamberlain, Chris K. Mechefske, *Queen's University, Kingston, ON, Canada*

UNCERTAIN PARAMETER ESTIMATION APPROACHES FOR INCREASING THE EFFECTIVENESS OF COMMAND-SHAPED ENGINE RESTART STRATEGIES
Student Competition Paper. DETC2017-67548

J. Justin Wilbanks, *Georgia Institute of Technology, Marietta, GA, USA,* ***Michael J. Leamy,*** *Georgia Institute of Technology, Atlanta, GA, USA*

OPTIMIZING PERIODIC RESPONSE OF PIEZO-DRIVEN, NONLINEAR, BUCKLED BEAMS
Technical Paper Publication. DETC2017-67450

James Wilson, *Ethicon, Greenwich, CT, USA,* ***Amit Shukla,*** *Miami University, Oxford, OH, USA,* ***William Olson,*** *Ethicon Endo-surgery, Blue Ash, OH, USA*

FINITE ELEMENT MODELING OF STOCKBRIDGE DAMPER AND VIBRATION ANALYSIS: EQUIVALENT CABLE STIFFNESS
Technical Paper Publication. DETC2017-68130

Nitish Kumar Vaja, *Central Michigan University, Mount Pleasant, MI, USA,* ***Oumar Barry,*** *Central Michigan University, Mt Pleasant, MI, USA,* ***Brian DeJong,*** *Central Michigan University, Mount Pleasant, MI, USA*

VIB-15-1: MECHANICAL AND ACOUSTIC METAMATERIALS I

BALLROOM LEVEL, ROOM 25C **2:00PM–3:40PM**

Session Organizer: **Ryan L Harne,** *The Ohio State University, Columbus, OH, USA*

Session Co-Organizer: **Massimo Ruzzene,** *Georgia Institute of Tech, Atlanta, GA, USA*

TOPOLOGICAL ROBUSTNESS AND NON-RECIPROCITY IN MECHANICAL AND ACOUSTIC METAMATERIALS
Technical Presentation. DETC2017-67505

Andrea Alu, *The University of Texas at Austin, Austin, TX, USA*

COMPUTATIONAL CHARACTERIZATION OF DOUBLE POROSITY METAMATERIALS FOR BROADBAND SOUND INSULATION
Student Competition Paper. DETC2017-67552

Shichao Cui, Ryan L Harne, *The Ohio State University, Columbus, OH, USA*

TOWARDS A COMPLETE CHARACTERIZATION OF THE ELASTIC TENSORS OF 3D-PRINTED MATERIALS
Technical Presentation. DETC2017-67662

Graeme Milton, *University of Utah, Salt Lake City, UT, USA*

BIOMED-2-2: BIOROBOTICS AND HAPTICS II

EXHIBIT HALL LEVEL, ROOM 21 **2:00PM–3:40PM**

Session Organizers: Not Determined at Press Time

PALPATION-LIKE DEVICES OF BALL INDENTATION FOR SOFTNESS EVALUATION OF BIOLOGICAL TISSUE
Technical Paper Publication. DETC2017-67010

Atsushi Sakuma, *Kyoto Institute of Technology, Sakyo-ku, Kyoto, Japan,* ***Yuki Shirai,*** *Graduate School, Kyoto Institute of Technology, Sakyo-ku, Kyoto, Japan*

A PRESSURE MODULATING SENSORIZED SOFT ACTUATOR ARRAY FOR PRESSURE ULCER PREVENTION
Technical Paper Publication. DETC2017-68191

Wei Carrigan, *University of Texas at Arlington, Fort Worth, TX, USA,* ***Pavan Nuthi,*** *University of Texas at Arlington Research Institute, Fort Worth, TX, USA,* ***Charu Pande,*** *University of Texas at Arlington Research Institute, Fort Worth, TX, USA,* ***Caleb P. Nothnagle, Muthu B. J. Wijesundara,*** *The University of Texas at Arlington Research Institute, Fort Worth, TX, USA*

DEVELOPMENT OF A SIMULATION ENDOSCOPE FOR VIRTUAL ENDOSCOPY TRAINING
Technical Paper Publication. DETC2017-68413

Mythra V. S. Balakuntala, Shanthanu Chakravarthy, Nithin Shivashankar, Vijay Natarajan, *Indian Institute of Science, Bengaluru, Karnataka, India,* ***GK Ananthasuresh,*** *Indian Institute of Science, Bangalore, Bangalore, Karnataka, India*

AVT-3-1: ADVANCES IN METHODS FOR GROUND VEHICLE SYSTEMS DESIGN

EXHIBIT HALL LEVEL, ROOM 24 **4:00PM–5:40PM**

Session Organizer: **Massimiliano Gobbi,** *Politecnico di Milano, Milan, Italy*

Session Co-Organizers: **Guangqiang Wu,** *Tongji University, Shanghai, China,* **Xiaobo Yang,** *Oshkosh Corporation, Oshkosh, WI, USA*

IMPROVEMENT OF HARVESTERS FOR TIRES BY MEANS OF MULTI-PHYSICS SIMULATION
Technical Paper Publication. DETC2017-67301

Alberto Doria, *University of Padova-Dept of Industrial Eng, Padova, Italy,* ***Cristian Medè,*** *University of Padova-DII, Padova, Italy,* ***Daniele Desideri,*** *University of Padova- DII, Padova, Italy,* ***Alvise Maschio,*** *University of Padova–DII, Padova, Italy,* ***Federico Moro,*** *University of Padova-DII, Padova, Italy*

THE DIMENSION MATCH AND PARAMETERS SETTING OF THE HYDRAULIC MOTOR FOR THE HYDRAULIC-ELECTROMAGNETIC ENERGY-REGENERATIVE SHOCK ABSORBER
Technical Paper Publication. DETC2017-68093

Jia Mi, Lin Xu, Sijing Guo, Mohamed A. A. Abdelkareem, *Wuhan University of Technology, Wuhan, Hubei, China,* ***Lingshuai Meng,*** *Wuhan University of Technology, Wuhan/Hubei, Hubei, China,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

DESIGN, MODELING AND LAB TEST OF ELECTROMAGNETIC ENERGY HARVESTER FOR RAILWAY VEHICLE SUSPENSIONS
Student Competition Paper. DETC2017-67885

Yu Pan, *Virginia Tech, Blacksburg, VA, USA,* ***Fengwei Liu, Ruijin Jiang, Zhiwen Tu,*** *CRRC Yangtze Co., Ltd., Wuhan, China,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

THEORETICAL AND EXPERIMENTAL STUDY ON LIP SEAL LOSSES IN LARGE HIGH-SPEED ROTORS
Student Competition Paper. DETC2017-67856

Narayan Jatinder Bhatia, Elia Missaglia, *Politecnico Di Milano, Milan, Italy,* ***Giorgio Previati,*** *Politecnico Di Milano, Milan, Italy,* ***Gianpiero Mastinu, Kesavan Ramakrishnan, Massimiliano Gobbi,*** *Politecnico Di Milano, Milan, Italy*

PROOF-OF-CONCEPT DESIGN OF ELECTRONIC WEDGE BRAKE WITH MULTI-ROLLERS
Technical Paper Publication. DETC2017-68103

Liangyao Yu, Jinghu Chang, Sheng Zheng, *Tsinghua University, Beijing, China*

CIE-1-2: AMS GENERAL II

CONCOURSE LEVEL, ROOM 3 **4:00PM–5:40PM**

Session Organizer: **Ashok Kumar,** *University of Florida, Gainesville, FL, USA*

DATA FITTING USING NATURAL BERNSTEIN-BEZIER FUNCTIONS
Technical Paper Publication. DETC2017-67215

P. Venkataraman, *Rochester Institute of Technology, Rochester, NY, USA*

APPROXIMATE ANALYTICAL SOLUTIONS TO INVERSE BOUNDARY VALUE PROBLEMS WITH SPARSE DATA
Technical Paper Publication. DETC2017-67233

P. Venkataraman, *Rochester Institute of Technology, Rochester, NY, USA*

MESH INDEPENDENT MODELING OF ESSENTIAL, INTERFACE AND PERIODIC BOUNDARY CONDITIONS USING STEP BOUNDARY METHOD
Technical Paper Publication. DETC2017-68044

Aswath Manogaran, Ashok Kumar, *University of Florida, Gainesville, FL, USA*

TOWARDS AN ANALYTICAL, COMPUTATIONAL AND EXPERIMENTAL FRAMEWORK FOR PREDICTING AGING OF CATHODIC SURFACES
Technical Paper Publication. DETC2017-67811

John Michopoulos, *Naval Research Laboratory, Washington, DC, USA,* ***Athanasios Iliopoulos,*** *US Naval Research Laboratory, Washington, DC, USA,* ***John Steuben,*** *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***Virginia Degiorgi,*** *Naval Research Lab, Washington, DC, USA*

EQUIPPING ENGINEERS FOR SUPPORT IN THE COMPUTATIONAL SCIENCE FIELDS
Technical Presentation. DETC2017-68145

Melanie Ambrose, *Honeywell FM&T, Kansas City, MO, USA*

CIE-8-2: CAPPD GENERAL II

CONCOURSE LEVEL, ROOM 4 **4:00PM–5:40PM**

Session Organizer: **Joshua Summers,** *Clemson University, South Carolina, SC, USA*

MOTION TOLERANCING BASED ON SKIN MODEL SHAPES BY FORM DEVIATION PARAMETRIZATION AND META-MODELLING
Technical Paper Publication. DETC2017-67227

Benjamin Schleich, *Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany,* ***Sandro Wartzack,*** *Friedrich-Alexander-University Erlangen-Nuernberg, Erlangen, Germany*

ROBUST RECOVERY OF 3D GEOMETRIC PRIMITIVES FROM POINT CLOUD
Technical Paper Publication. DETC2017-67564

Xiang Yang, Peter Meer, H. C. Gea, *Rutgers, The State University of New Jersey, Piscataway, NJ, USA*

DEVELOPING A METHOD FOR CLASSIFYING DESIGN ENABLERS
Technical Paper Publication. DETC2017-68121

Elizabeth Gendreau, *Clemson University, Lexington, SC, USA,* ***Steven O'Shields,*** *Clemson University, Anderson, SC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA*

SYSTEM STATE MONITORING TO FACILITATE SAFE AND EFFICIENT HUMAN-ROBOT COLLABORATION IN HYBRID ASSEMBLY CELLS
Technical Paper Publication. DETC2017-68269

Carlos Morato, *ASEA Brown Boveri (ABB), Winsor, CT, USA,* ***Krishna Kaipa,*** *Old Dominion University, Norfolk, VA, USA,* ***Satyandra Gupta,*** *University of Southern California, Los Angeles, CA, USA*

INFRASTRUCTURE DAMAGE INSPECTION AND LIFE ESTIMATION
Industry Proposal. DETC2017-67645

Shu-Ping Lin, Wei-Hao Lu, *GL Design Automation Company, Ltd., Taipei, Taiwan,* ***Po Ting Lin,*** *National Taiwan University of Science and Technology, Taipei, Taiwan,* ***Kuang-Yen Liu,*** *National Cheng Kung University, Tainan, Taiwan*

CIE-17-1: SMART MANUFACTURING INFOMATICS

CONCOURSE LEVEL, ROOM 5 **4:00PM–5:40PM**

Session Organizer: **Ashis Banerjee,** *University of Washington, Seattle, WA, USA*

Session Co-Organizer: **Farhad Ameri,** *Texas State University, San Marcos, TX, USA*

OPTIMALITY CONDITIONS FOR CONSTRAINED LEAST-SQUARES FITTING OF CIRCLES, CYLINDERS, AND SPHERES TO ESTABLISH DATUMS
Technical Paper Publication. DETC2017-67143

Craig Shakarji, *NIST, Gaithersburg, MD, USA,* ***Vijay Srinivasan,*** *National Institute of Standards and Technology, Gaithersburg, MD, USA*

A THESAURUS-GUIDED TEXT ANALYTICS TECHNIQUE FOR CAPABILITY-BASED CLASSIFICATION OF MANUFACTURING SUPPLIERS
Technical Paper Publication. DETC2017-67652

Farhad Ameri, Ramin Sabbagh, *Texas State University, San Marcos, TX, USA*

ANALYSIS OF DRILLING PROCESS KNOWLEDGE DERIVED FROM MICRODRILL CATALOG DATABASE USING DATA-MINING METHOD
Technical Paper Publication. DETC2017-67680

Shogo Tabata, *Doshisha University, Kyotanabe-shi, Kyoto, Japan,* ***Eiichi Aoyama, Toshiki Hirogaki,*** *Doshisha University, Kyotanabe, Kyoto, Japan,* ***Hiroyuki Kodama,*** *University of Hyogo, Himeji, Hyogo, Japan*

A GENERALIZED METHOD FOR FEATURIZATION OF MANUFACTURING SIGNALS, WITH APPLICATION TO TOOL CONDITION MONITORING
Technical Paper Publication. DETC2017-67987

Max Ferguson, Kincho H. Law, *Stanford University, Stanford, CA, USA,* ***Yung-Tsun Tina Lee,*** *National Institute of Standards and Technology, Gaithersburg, MD, USA,* ***Raunak Bhinge,*** *Infinite Uptime, Berkeley, CA, USA*

CONVNET-BASED OPTICAL RECOGNITION FOR ENGINEERING DRAWINGS
Technical Paper Publication. DETC2017-68186

Andrew Brock, *Heriot-Watt University, Edinburgh, United Kingdom,* ***Theo Lim,*** *Heriot-Watt University, Edinburgh, Scotland,* ***James Ritchie,*** *Heriot-Watt University, Edinburgh, United Kingdom,* ***Nick Weston,*** *Renishaw plc, Edinburgh, United Kingdom*

DAC-3-1: DATA-DRIVEN DESIGN

CONCOURSE LEVEL, ROOM 6 **4:00PM–5:40PM**

Session Organizer: **Conrad Tucker,** *Penn State University, State College, PA, USA*

Session Co-Organizer: **Andrew Olewnik,** *University at Buffalo, Buffalo, NY, USA*

LEVERAGING LOGGED INTERMEDIATE DESIGN ATTRIBUTES FOR IMPROVED KNOWLEDGE DISCOVERY IN ENGINEERING DESIGN
Technical Paper Publication. DETC2017-67835

Hyunseung Bang, Daniel Selva, *Cornell University, Ithaca, NY, USA*

FINDING CAUSALITY IN SOCIO-TECHNICAL SYSTEMS: A COMPARISON OF BAYESIAN NETWORK STRUCTURE LEARNING ALGORITHMS
Technical Paper Publication. DETC2017-67414

William Martin, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Cassandra Telenko,*** *Georgia Institute of Technology, Georgia, GA, USA*

LINKING CREATIVITY MEASUREMENTS TO PRODUCT MARKET FAVORABILITY: A DATA-MINING APPROACH
Technical Paper Publication. DETC2017-67622

Christian E. Lopez, *Penn State University, University Park, PA, USA,* ***Xuan Zheng,*** *The Pennsylvania State University, University Park, PA, USA,* ***Scarlett Miller,*** *The Pennsylvania State University, University Park, PA, USA*

AN INTEGRATED FRAMEWORK FOR PREDICTING CONSUMER CHOICE THROUGH MODELING OF PREFERENCE AND PRODUCT USE DATA
Technical Paper Publication. DETC2017-68010

Dipanjan Ghosh, *SUNY Buffalo, Buffalo, NY, USA,* ***Andrew Olewnik,*** *University at Buffalo, Buffalo, NY, USA,* ***Kemper Lewis,*** *University at Buffalo – SUNY, Buffalo, NY, USA*

NETWORK ANALYSIS OF DESIGN AUTOMATION LITERATURE
Technical Paper Publication. DETC2017-67361

Tinghao Guo, *Univ. of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Jiarui Xu,*** *Carnegie Mellon University, Pittsburgh, PA, USA,* ***Yue Sun, Yilin Dong, Neal E. Davis, James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

DAC-17-1: PLATFORM ARCHITECTURE AND PRODUCT FAMILY DESIGN

CONCOURSE LEVEL, ROOM 8 **4:00PM–5:40PM**

Session Organizer: **Christopher Hoyle,** *Oregon State University, Corvallis, OR, USA*

Session Co-Organizer: **Sangjin Jung,** *Penn State University, University Park, PA, USA*

EXPLORING ARCHITECTURE SELECTION AND SYSTEM EVOLVABILITY
Technical Paper Publication. DETC2017-68290

Samantha White, *North Carolina State University, Knoxville, TN, USA,* ***Scott Ferguson,*** *North Carolina State University, North Carolina, NC, USA*

PRODUCT FAMILY AND PRODUCT PLATFORM BENCHMARKING WITH COMMONALITY AND VARIETY INDICES
Technical Paper Publication. DETC2017-67500

Timothy W. Simpson, *Penn State University, University Park, PA, USA*

FIELD ISOLATION AS A BASIS FOR MODULAR PRODUCT ARCHITECTURE
Technical Paper Publication. DETC2017-67751

Valterri Niutanen, *Aalto University, Aalto, Finland,* ***Kevin Otto,*** *Aalto University, Espoo, Finland*

OPTIMAL DESIGN AND ROBUSTNESS ASSESSMENT OF PRODUCT FAMILY CONSIDERING QUANTITY DISCOUNTS IN SUPPLY CHAIN
Technical Paper Publication. DETC2017-67688

Yutaka Nomaguchi, *Osaka University, Suita, Osaka, Japan,* ***Daiki Osaki,*** *Osaka University, Suita, Osaka, Japan,* ***Kikuo Fujita,*** *Osaka University, Suita 565-0871, Osaka, Japan*

DAC-19-1: SIMULATION-BASED DESIGN UNDER UNCERTAINTY 1

CONCOURSE LEVEL, ROOM 7 **4:00PM–5:40PM**

Session Organizer: **Zissimos Mourelatos,** *Oakland University, Rochester, MI, USA*

Session Co-Organizer: **Zhen Hu,** *Vanderbilt University, Nashville, TN, USA*

EFFECT OF DEPENDENT DISTRIBUTION PARAMETERS ON RELIABILITY PREDICTION
Technical Paper Publication. DETC2017-67280

Yao Cheng, Xiaoping Du, *Missouri University of Science and Technology, Rolla, MO, USA*

RELIABILITY-BASED TOPOLOGY OPTIMIZATION USING MEAN-VALUE SECOND-ORDER SADDLEPOINT APPROXIMATION
Technical Paper Publication. DETC2017-67312

Dimitrios Papadimitriou, Zissimos Mourelatos, *Oakland University, Rochester, MI, USA*

ITERATIVE MOST PROBABLE POINT SEARCH METHOD FOR PROBLEMS WITH MIXTURE OF RANDOM AND INTERVAL VARIABLES
Technical Paper Publication. DETC2017-67909

Hyunkyoo Cho, *The University of Iowa, Iowa City, IA, USA,* ***Kyung K. Choi,*** *University of Iowa, Iowa City, IA, USA*

RELIABILITY OF NONLINEAR VIBRATORY SYSTEMS UNDER NON-GAUSSIAN LOADS
Technical Paper Publication. DETC2017-67313

Vasileios Geroulas, Zissimos Mourelatos, Vasiliki Tsianika, Igor Baseski, *Oakland University, Rochester, MI, USA*

DEC-4-2: PANEL – TO BE A MAKER SPACE OR NOT TO BE: MAKER SPACE AND MACHINE SHOP SYNERGIES

EXHIBIT HALL LEVEL, ROOM 23 **4:00PM–5:40PM**

Session Organizer: **Daniela Faas,** *Olin College of Engineering, Needham, MA, USA*

Sunand Bhattacharya, *Autodesk, Inc.,* ***Robert Nagel,*** James Madison University, ***Jesse Austin-Breneman,*** University of Michigan

DFMLC-2-2: SUSTAINABLE DESIGN AND MANUFACTURING

EXHIBIT HALL LEVEL, ROOM 22 **4:00PM–5:40PM**

Session Organizer: **Qing Wang,** *Durham University, Durham, United Kingdom*

Session Co-Organizer: **Devarajan Ramanujan,** *MIT, Massachusetts, MA, USA*

LITHIUM-ION LAPTOP BATTERY TEST AND ENERGY RECYCLING

Technical Paper Publication. DETC2017-67803

JieXin Zhou, *National University of Defense Technology, Chang Sha, China,* ***Qing Wang,*** *Durham University, Durham, United Kingdom,* ***Jie Wang,*** *China Academy of Space Technology, Beijing, China*

DESIGN PATTERNS FOR VISUALIZATION-BASED TOOLS IN SUSTAINABLE PRODUCT DESIGN

Technical Paper Publication. DETC2017-68054

Devarajan Ramanujan, *MIT, Massachusetts, MA, USA,* ***William Bernstein,*** *National Institute of Standards and Technology, Gaithersburg, MD, USA,* ***Karthik Ramani,*** *Purdue University, W Lafayette, IN, USA*

CONCEPTUAL REGENERATIVE NOZZLE COOLING DESIGN FOR A HYDROXYL-TERMINATED POLYBUTADIENE AND OXYGEN HYBRID ROCKET ENGINE

Technical Paper Publication. DETC2017-68396

Luis Robles, Johnny D. Ho, Bao Binh Nguyen, Jeremy Surmi, Khulood Faruqui, Ashley Carter, Tom Hinz, Zachariah Zousel, Fady Kakish, Geoffrey Wagner, Kory Matthys, Joseph Piacenza, *California State University Fullerton, California, CA, USA*

EXPERIMENTAL INVESTIGATION AND ANALYSIS ON DYNAMIC STRAIN OF LEADING TRAILING SHOE DRUM BRAKE

Technical Paper Publication. DETC2017-68436

Xiaoying Wang, Zijie Fan, *Tsinghua University, Beijing, China,* ***Jia Li,*** *Beijing Forestry University, Beijing, China,* ***Liangjin Gui,*** *Tsinghua University, Beijing, China*

DTM-3-1: USER PREFERENCES

EXHIBIT HALL LEVEL, ROOM 20 **4:00PM–5:40PM**

Session Organizer: **Alice Agogino,** *University of California, Berkeley, Berkeley, CA, USA*

Session Co-Organizer: **Vimal Kumar Cherickal Viswanathan,** *San Jose State University, San Jose, CA, USA*

DESIGN OF MULTI-PURPOSE PRODUCTS: GUIDELINES FROM A USER PERSPECTIVE

Technical Paper Publication. DETC2017-67150

Vimal Kumar Cherickal Viswanathan, *San Jose State University, San Jose, CA, USA,* ***Shraddha Sangelkar,*** *Penn State Erie, The Behrend College, Erie, PA, USA*

SCENARIO-BASED CONJOINT ANALYSIS: MEASURING PREFERENCES IN USER EXPERIENCE ATTRIBUTES IN EARLY STAGE DESIGN

Technical Paper Publication. DETC2017-67690

Hyeji Kim, *Analytic Consulting-Americas, Fair Isaac Corporation, San Rafael, CA, USA,* ***Jing Chen,*** *University of California, Berkeley, Berkeley, CA, USA,* ***Euiyoung Kim,*** *UC Berkeley, Berkeley, CA, USA,* ***Alice Agogino,*** *University of California, Berkeley, Berkeley, CA, USA*

THE CREATION OF AN ONTOLOGY TO EXAMINE CUSTOMER NEEDS

Technical Paper Publication. DETC2017-67882

Anthony Nix, Ryan Arlitt, Mark Lemke, Robert Stone, *Oregon State University, Corvallis, OR, USA*

DESIGNING FOR TRUST: UNDERSTANDING THE ROLE OF AGENT GENDER AND LOCATION ON USER PERCEPTIONS OF TRUST IN HOME AUTOMATION

Technical Paper Publication. DETC2017-68349

Nicole Damen, Christine Toh, *University of Nebraska at Omaha, Omaha, NE, USA*

DESIGN PREFERENCE PREDICTION WITH DATA PRIVACY SAFEGUARDS: A PRELIMINARY STUDY

Technical Paper Publication. DETC2017-68366

Alex Burnap, Panos Papalambros, *University of Michigan, Ann Arbor, MI, USA*

MR-1-4: SPATIAL MECHANISMS

EXHIBIT HALL LEVEL, ROOM 10 **4:00PM–5:40PM**

Session Organizer: **J. Michael McCarthy,** *University of California, Irvine, Irvine, CA, USA*

Session Co-Organizer: **Sarah C. Baxter,** *University of St. Thomas, Saint Paul, MN, USA*

SPHERICAL LINKAGES ANALYSIS AND SYNTHESIS BY SPECIAL UNITARY MATRICES FOR SOLUTION VIA NUMERICAL ALGEBRAIC GEOMETRY

Technical Paper Publication. DETC2017-68318

Saleh Mohamed Almestiri, Andrew P. Murray, *University of Dayton, Dayton, OH, USA,* ***David Myszka,*** *University of Dayton, Dayton, OH, USA*

SYNTHESIS OF SPATIAL 3R CHAINS WITH CONFIGURATION-SPECIFIC TWIST SYSTEM
Technical Paper Publication. DETC2017-67905

Neda Hassanzadeh, Mason Wegert, Maria Alba Perez Gracia, *Idaho State University, Pocatello, ID, USA*

A FIXED-ACTUATOR CONFIGURATION FOR 3-LEG 6-DOF ROBOTS
Technical Paper Publication. DETC2017-67768

Carl Nelson, *University of Nebraska, Lincoln, NE, USA*

SYNTHESIS OF 4C AND RCCC LINKAGES TO VISIT FOUR POSITIONS BASED ON SOLUTION REGION METHODOLOGY
Technical Paper Publication. DETC2017-68214

Jianyou Han, Yang Cao, *University of Science and Technology Beijing, China*

DESIGN AND ANALYSIS OF A NEW TYPE FORGING MANIPULATOR
Technical Paper Publication. DETC2017-67302

Yanwen Li, Xiaofei Shi, Pengfei Mao, Yubo Cai, Maoling Wang, *Yanshan University, Qinhuangdao, Hebei Province, China*

MR-4-4: BIO-INSPIRATION & ENERGY ABSORPTION

EXHIBIT HALL LEVEL, ROOM 9 **4:00PM–5:40PM**

Session Organizer: **Richard Malak,** *Texas A&M University, College Station, TX, USA*

Session Co-Organizer: **Ryan L. Harne,** *The Ohio State University, Columbus, OH, USA*

DESIGN OF A BEETLE INSPIRED DEPLOYABLE WING
Technical Paper Publication. DETC2017-67697

Kazuya Saito, *University of Tokyo, Tokyo, Japan,* ***Tomohiro Tachi, Ryuma Niyama, Yoshihiro Kawahara,*** *The University of Tokyo, Tokyo, Japan*

THE SNAP-THROUGH OF FOUR-FOLD ORIGAMI CONES
Technical Paper Publication. DETC2017-68244

Alexander Pagano, *University of Illinois at Urbana Champaign, Urbana, IL, USA,* ***Sameh Tawfick,*** *University of Illinois, Urbana, IL, USA*

DEVELOPMENT OF A KEYWORD SEARCH ALGORITHM FOR BIOINSPIRED DESIGN OF FOLDABLE ENGINEERING APPLICATIONS
Technical Paper Publication. DETC2017-67958

Elissa Morris, *Texas A&M University, Bryan, TX, USA,* ***Professor Daniel McAdams,*** *Texas A&M University, College Station, TX, USA*

ELASTIC ENERGY ABSORPTION OF ORIGAMI-BASED CORRUGATIONS
Technical Paper Publication. DETC2017-67081

Sean Tolman, *Utah Valley University, Orem, UT, USA,* ***Spencer P. Magleby,*** *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

INVESTIGATION OF HELMET BASED ON ORIGAMI STRUCTURES
Technical Paper Publication. DETC2017-67391

Yang Yang, Chie Nara, Xiaoshi Chen, *Meiji University, Tokyo, Japan,* ***Ichiro Hagiwara,*** *Meiji University, Kanagawa, Tokyo, Japan*

MR-8-4: ACTUATION SYSTEMS

EXHIBIT HALL LEVEL, ROOM 11 **4:00PM–5:40PM**

Session Organizer: **Gim Song Soh,** *Singapore University of Technology and Design, Singapore*

Session Co-Organizer: **Guangbo Hao,** *University College Cork, Cork, Ireland*

MICRO POWER MULTIPLEXER, A COMPACT DEVICE THAT CONTROLS MECHANICAL POWER FLOW
Technical Paper Publication. DETC2017-68084

Xiaoguang Zhang, Dennis Hong, *University of California, Los Angeles, Los Angeles, CA, USA*

FUSION CLUTCH: A BI-STABLE LATCHING MECHANISM FOR HUMAN-SAFE ROBOTS
Technical Paper Publication. DETC2017-68280

Jillian C. Cochran, Jimin Hong, *Yale University, New Haven, CT, USA,* ***Aaron M. Dollar,*** *Yale University, New Haven, CT, USA*

A LOBSTER-INSPIRED HYBRID ACTUATOR WITH RIGID AND SOFT COMPONENTS
Technical Paper Publication. DETC2017-68082

Yaohui Chen, Sing Le, Qiao Chu Tan, Oscar Lau, Chaoyang Song, *Monash University, Clayton, Victorial, Australia*

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF A PASSIVELY CONTROLLED INFINITELY VARIABLE POSITIVE DISPLACEMENT WATER PUMP
Technical Paper Publication. DETC2017-68061 ****Engineering For Global Development Paper****

John A. Mullen, Timothy Cyders, *Ohio University, Athens, OH, USA*

DESIGN OF A MULTI-DOF MOTION SYSTEM FOR X-RAY SPLIT AND DELAY
Technical Paper Publication. DETC2017-68402

Hongliang Shi, Diling Zhu, Don Schafer, Andrew H. Barada, Yanwen Sun, Lin Zhang, Karl L. Gumerlock, Justin H. James, Ted O. Osier, Randy A. Whitney, Brian E. Smith, Aymeric Robert, *SLAC National Accelerator Laboratory, Stanford University, Menlo Park, CA, USA,*

MNS-6-2: MEMS SENSORS

EXHIBIT HALL LEVEL, ROOM 13 **4:00PM–5:40PM**

Session Organizer: **Shahrzad Towfighian,** *Binghamton University, Binghamton, NY, USA*

Session Co-Organizer: **Kenn Oldham,** *University of Michigan, Ann Arbor, MI, USA*

MEMS COUPLED RESONATOR FOR FILTER APPLICATION IN AIR
Technical Paper Publication. DETC2017-67875

Saad Ilyas, Nizar R. Jaber, *King Abdullah University of Science & Technology, Thuwal, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

SENSITIVITY ENHANCEMENT OF RESONANT MICROMECHANICAL CANTILEVERS USING FRINGING ELECTROSTATIC FIELDS
Technical Presentation. DETC2017-68482

Naftaly Krakover, *Tel Aviv University, Tel Aviv, Israel,* ***Bojan R. Ilic,*** *NIST, Gaithersburg, MD, USA,* ***Slava Krylov,*** *Tel Aviv Univ, Tel Aviv, Israel*

LARGE DEFLECTION DYNAMICS OF MULTI-LAYER PIEZOELECTRIC MICROBEAM WITH PIEZOELECTRIC GAIN NONLINEARITY AND PARYLENE-C COATING
Technical Presentation. DETC2017-68327

Zahra Afkhami, Jongsoo Choi, Joseph Jang, Kyle Liepelt, Kenn Oldham, *University of Michigan, Ann Arbor, MI, USA*

MODELING AND DESIGN ENHANCEMENT OF DIFFERENTIAL-FREQUENCY MICROGYROSCOPES MADE OF NANOCRYSTAL-LINE MATERIAL
Technical Paper Publication. DETC2017-67075

Mehdi Ghommem, *American University of Sharjah, Sharjah, United Arab Emirates,* ***Abdessattar Abdelkefi,*** *New Mexico State University, Las Cruces, NM, USA*

MESA-6-2: FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS (FDTA) II

EXHIBIT HALL LEVEL, ROOM 14 **4:00PM–5:40PM**

Session Organizer: **Yangquan Chen,** *University of California Merced, Merced, CA, USA*

IMAGE SEGMENTATION BASED ON FRACTIONAL DIFFERENTIATION AND RSF MODEL
Technical Paper Publication. DETC2017-67110

Guimei Zhang, *Nanchang Hangkong University, Nanchang, Jiangxi Province, China,* ***Yangang Zhu,*** *Nanchang Hangkong University, Nanchang, Jiangxi Province, China,* ***Jianxin Liu,*** *Xi Hua University, Chengdu, Sichuan, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

A SURVEY OF FRACTIONAL-ORDER NEURAL NETWORKS
Technical Paper Publication. DETC2017-67129

Shuo Zhang, *Beijing Jiaotong University, Beijing, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA,* ***Yongguang Yu,*** *Beijing Jiaotong University, Beijing, China*

AN EVALUATION OF ARFIMA PROGRAMS
Technical Paper Publication. DETC2017-67483

Kai Liu, Xi Zhang, *China University of Mining Technology Beijing, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

ON THE CONTROLLABILITY OF DISTRIBUTED ORDER FRACTIONAL SYSTEMS WITH DISTRIBUTED DELAYS
Technical Paper Publication. DETC2017-67685

Binbin He, *Donghua University, Shanghai, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA,* ***Chunhai Kou,*** *Donghua University, Shanghai, China*

MESA-22-1: DISTURBANCE REJECTION CONTROL (DRC) I

EXHIBIT HALL LEVEL, ROOM 19 **4:00PM–5:40PM**

Session Organizer: **Zhiqiang Pu,** *Institute of Automation, Chinese Academy of Sciences, Beijing, China*

Session Co-Organizer: **Shen Zhao,** *Facility for Rare Isotope Beams, Michigan State University, East Lansing, MI, USA*

ON PERFORMANCE ANALYSIS OF GENERAL OBSERVERS FOR UNCERTAIN SYSTEMS
Technical Paper Publication. DETC2017-67095

Wenyan Bai, *Beijing Aerospace Automatic Control Institute, Beijing, China,* ***Sen Chen, Yi Huang,*** *Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China,* ***Wenchao Xue,*** *Chinese Academy of Sciences, Tianjin, China,* ***Ping Liu,*** *Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China*

A NOVEL TIME-VARYING SPECTRUM BASED APPROACH TO ACTIVE DISTURBANCE REJECTION CONTROL
Technical Paper Publication. DETC2017-67096

Zhiqiang Pu, Xiangmin Tan, Ruyi Yuan, Jianqiang Yi, *Institute of Automation, Chinese Academy of Sciences, Beijing, China*

GENERALIZED DISTURBANCE OBSERVER SYNTHESIS USING A TWO-STAGE HEURISTIC ALGORITHM
Technical Paper Publication. DETC2017-67114

Guofei Xiang, Jianbo Su, *Shanghai Jiao Tong University, Shanghai, China*

SMOOTH SWITCHING DESIGN/IMPLEMENTATION OF THE ACTIVE DISTURBANCE REJECTION CONTROL
Technical Paper Publication. DETC2017-67119

Shen Zhao, Dan Morris, *Facility for Rare Isotope Beams, Michigan State University, East Lansing, MI, USA,* ***Zhiqiang Gao,*** *Cleveland State University, Cleveland, OH, USA*

MSNDC-5-2: NONLINEAR DYNAMICS OF STRUCTURES II

[Cross-listed with VIB-4]

BALLROOM LEVEL, ROOM 25B **4:00PM–5:40PM**

Session Organizer: **Enrico Babilio,** *Universita degli Studi di Napoli Federico II, Napoli, Italy*

Session Co-Organizer: **Laura Ruzziconi,** *Universita Politecnica delle Marche, Ancona, Italy*

NONLINEAR DYNAMICS OF A SLENDER AXIALLY GRADED BEAM EMBEDDED IN A VISCOELASTIC MEDIUM
Technical Paper Publication. DETC2017-68464

Enrico Babilio, *Universita degli Studi di Napoli Federico II, Napoli, Italy*

NONLINEAR MODAL INTERACTIONS OF A PARAMETRICALLY EXCITED COMPOSITE COLUMN
Technical Paper Publication. DETC2017-67249

Jerzy Warminski, *Lublin University of Technology, Lublin, Poland,* ***Andrzej Teter,*** *Department of Applied Mechanics, Lublin University of Technology, Lublin, Lublin, Poland*

DYNAMIC RESPONSE AND IDENTIFICATION OF TOWER-CABLE-ROLLER BATTERY INTERACTIONS IN ROPEWAYS
Technical Paper Publication. DETC2017-67810

Andrea Arena, Biagio Carboni, *Sapienza University of Rome, Rome, RM, Italy,* ***Walter Lacarbonara,*** *University of Rome La Sapienza-disg, Rome, Italy,* ***Mathieu Babaz,*** *POMA, Voreppe Cedez, France*

FREE DYNAMICS OF MULTI-BLOCK ROCKING ASSEMBLIES
Technical Paper Publication. DETC2017-68014

Richard Wiebe, Tao Li, *University of Washington, Seattle, WA, USA*

FORECASTING CRITICAL POINTS AND POST-CRITICAL DYNAMICS OF NONLINEAR OSCILLATORY SYSTEMS
Technical Presentation. DETC2017-68510

Amin Ghadami, *University of Michigan, Ann Arbor, MI, USA,* ***Bogdan Epureanu,*** *University of Michigan, Ann Arbor, MI, USA*

MSNDC-10-1: MODELING, SIMULATION, AND VALIDATION OF VEHICLE DYNAMICS – 1

[Cross-listed with VIB-10]

BALLROOM LEVEL, ROOM 26A **4:00PM–5:40PM**

Session Organizer: **Hiroyuki Sugiyama,** *The University of Iowa, Iowa City, IA, USA*

Session Co-Organizers: **Paramsothy Jayakumar,** *U.S. Army RDECOM TARDEC, Warren, MI, USA,* **Werner Schiehlen,** *University of Stuttgart, Germany*

SUBSTITUTE MODEL FOR CRAWLER TRACK UNITS
Technical Paper Publication. DETC2017-67501

Henry Graness, Berthold Schlecht, *Technische Universität Dresden, Dresden, Saxonia, Germany*

EFFICIENT GENERATION OF ACCURATE MOBILITY MAPS USING MACHINE LEARNING ALGORITHMS
Technical Presentation. DETC2017-67507

Paramsothy Jayakumar, *U.S. Army RDECOM TARDEC, Warren, MI, USA,* ***Dave Mechergui,*** *U.S. Army TARDEC, Warren, MI, USA*

HYSTERESIS EFFECT IN THE NONLINEAR STABILITY OF TOWED WHEELS
Student Competition Paper. DETC2017-67722

Sandor Beregi, *Department of Applied Mechanics, Budapest University of Technology and Economics, Budapest, Hungary,* ***Denes Takacs,*** *Budapest University of Technology and Economics–MTA-TKI, Budapest, Hungary,* ***David Barton,*** *University of Bristol, Bristol, United Kingdom*

UNDERSTANDING THE EFFECTS OF SOIL CHARACTERISTICS ON MOBILITY
Technical Paper Publication. DETC2017-68314

Paramsothy Jayakumar, *U.S. Army RDECOM TARDEC, Warren, MI, USA,* ***Dave Mechergui,*** *U.S. Army TARDEC, Warren, MI, USA,* ***Tamer Wasfy,*** *Advanced Science and Automation Corp., Indianapolis, IN, USA*

MSNDC-11-1: CONTROL METHODS FOR NONLINEAR SYSTEM MODELS

BALLROOM LEVEL, ROOM 25A **4:00PM–5:40PM**

Session Organizer: **Elizbieta Jarzebowska,** *Warsaw University of Technology, Warsaw, Poland*

Session Co-Organizer: **Dirk Soeffker,** *Universitaet Duisburg-Essen, Duisburg, Germany*

REVIEW AND DISCUSSION ON MODEL REFERENCE ADAPTIVE CONTROL FOR MECHANICAL MECHANISMS
Technical Paper Publication. DETC2017-67378

Dan Zhang, Bin Wei, *York University, Toronto, ON, Canada*

PROPORTIONAL-INTEGRAL-OBSERVER WITH ADAPTIVE HIGH-GAIN DESIGN USING FUNNEL ADJUSTMENT CONCEPT
Technical Paper Publication. DETC2017-67428

Fateme Bakhshande, Dirk Söffker, *Duisburg-Essen University, Duisburg, Nordrhein-Westfalen, Germany*

DRIVING FORCE CONSTRAINT CORNER SMOOTHING METHOD FOR HIGH-SPEED MACHINE TOOLS
Technical Paper Publication. DETC2017-67466

Bingran Li, Hui Zhang, Peiqing Ye, *Tsinghua University, Beijing, China*

CONTROL OF NONLINEAR SYSTEMS IN NORMAL FORM BY COMPLEMENTARY LYAPUNOV FUNCTIONS
Technical Paper Publication. DETC2017-67805

Andy Zelenak, Benito Fernandez, Mitch Pryor, *The University of Texas at Austin, Austin, TX, USA*

COMPUTATIONAL REFERENCE DYNAMICAL MODEL OF A MULTIBODY SYSTEM WITH FIRST ORDER CONSTRAINTS
Technical Paper Publication. DETC2017-67969

Elizbieta Jarzebowska, *Warsaw University of Technology, Warsaw, Poland,* ***Krzysztof Augustynek, Andrzej Urbas,*** *University of Bielsko-Biala, Bielsko-Biala, Poland*

MSNDC-19-1: STUDENT PAPER COMPETITION

BALLROOM LEVEL, ROOM 26C **4:00PM–5:40PM**

Session Organizer: **James R Chagdes,** *Miami University, Oxford, OH, USA*

Session Co-Organizer: **Mohammad Poursina,** *University of Arizona, Tucson, AZ, USA*

EXPERIMENTAL EXPLORATION OF SCHALLAMACH WAVES IN A MULTIBODY BELT-DRIVE DYNAMICAL SYSTEM
Student Competition Presentation only. DETC2017-67561

Yingdan Wu, Michael Varenberg, Michael J. Leamy, *Georgia Institute of Technology, Atlanta, GA, USA*

MOVING IN THE RAIN: SHOULD WE RUN OR SHOULD WE WALK?
Student Competition Presentation only. DETC2017-68611

Michal Kwarta, *University of Wisconsin–Madison, WI, USA,* ***Arman Pazouki,*** *California State University, Los Angeles, Los Angeles, CA, USA,* ***Dan Negrut,*** *University of Wisconsin, Madison, WI, USA*

HYSTERESIS EFFECT IN THE NONLINEAR
Student Competition Presentation only. DETC2017-68612

Sandor Beregi, *Department of Applied Mechanics, Budapest University of Technology and Economics, Budapest, Hungary*

ANALYSIS OF SYSTEMS WITH GENERALIZED LIGHT DAMPING WITH EMPHASIS ON MODE-COUPLING AND INTERNAL RESONANCE
Student Competition Presentation only. DETC2017-68613

Allen Mathis, *The University of Akron, Wadsworth, OH, USA,* ***D. Dane Quinn,*** *Akron, OH, USA*

FRACTIONAL CHEBYSHEV COLLOCATION METHOD FOR SOLVING LINEAR FRACTIONAL-ORDER DELAY-DIFFERENTIAL EQUATIONS
Student Competition Presentation only. DETC2017-68610

Arman Dabiri, Eric Butcher, *University of Arizona, Tucson, AZ, USA*

FLEGX: A JUMPING FLEXIBLE ROBOTIC LEG
Student Competition Presentation only. DETC2017-68609

Daniele Ludovico, *Politecnico di Torino, Torino, Torino (Piemonte), Italy,* ***Mariapaola D'Imperio,*** *Istituto Italiano Di Tecnologia, Genova, Italy,* ***Ferdinando Cannella,*** *Istituto Italiano di Tecnologia, Polverigi (AN), Italy*

VIB-3-2: VIBRATION CONTROL AND SMART STRUCTURES I

[Cross-listed with MSNDC-2]

BALLROOM LEVEL, ROOM 26B **4:00PM–5:40PM**

Session Organizer: **Ryan L Harne,** *The Ohio State University, Columbus, OH, USA*

Session Co-Organizer: **Michael J. Leamy,** *Georgia Institute of Technology, Atlanta, GA, USA*

CONCURRENT DESIGN OF ACTIVE CONTROL AND STRUCTURAL MODIFICATIONS FOR EIGENSTRUCTURE ASSIGNMENT ON A CANTILEVER BEAM
Technical Paper Publication. DETC2017-67504

Dario Richiedei, Roberto Belotti, Alberto Trevisani, *Università Degli Studi Di Padova, Vicenza, Italy*

NOISE REDUCTION IN AN ACOUSTIC CAVITY USING A NONLINEAR MEMBRANE DRIVEN BY AN ELECTROACOUSTIC DEVICE
Technical Paper Publication. DETC2017-67709

Pierre-Yvon Bryk, *LMA CNRS, Marseille, France,* ***Sergio Bellizzi,*** *CNRS/LMA, Marseille, France,* ***Renaud Côte,*** *AMU LMA, Marseille, France*

UV-ACTIVATED FREQUENCY CONTROL OF BEAMS AND PLATES BASED ON ISOGEOMETRIC ANALYSIS
Technical Paper Publication. DETC2017-67667

Yujie Guo, Hornsen (HS) Tzou, *Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China*

PIEZOELECTRIC T-MATRIX DEVELOPMENT AND MULTIPLE SCATTERING ANALYSIS OF ELECTROACOUSTIC WAVE PROPAGATION IN THIN PLATES
Technical Paper Publication. DETC2017-67567

Amir Darabi, Michael J. Leamy, *Georgia Institute of Technology, Atlanta, GA, USA*

FREQUENCY CONTROL OF SHELL STRUCTURES WITH LIGHT-ACTIVATED SHAPE MEMORY POLYMERS BASED ON ISO-GEOMETRIC ANALYSIS
Technical Paper Publication. DETC2017-67693

Yujie Guo, Hornsen (HS) Tzou, *Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China*

VIB-6-1: NUMERICAL METHODS FOR JOINTED STRUCTURE RESPONSE

[Cross-listed with MSNDC-4]

BALLROOM LEVEL, ROOM 25C **4:00PM–5:40PM**

Session Organizer: **Adam Brink,** *Sandia National Laboratories, Albuquerque, NM, USA*

RECONCILING WHOLE JOINT MODELS AND THE PRESERVATION OF LOCAL KINEMATICS
Technical Presentation. DETC2017-67271

Matthew Brake, Clayton Little, Adam Lewis, Matthew O'Gorman, *William Marsh Rice University, Houston, TX, USA*

EFFICIENT REDUCED-ORDER MODELING AND RESPONSE APPROXIMATION FOR CRACKED STRUCTURES
Technical Paper Publication. DETC2017-67379

Meng-Hsuan Tien, Tianyi Hu, Kiran D'Souza, *The Ohio State University, Columbus, OH, USA*

ON HURTY/CRAIG-BAMPTON SUBSTRUCTURING WITH INTERFACE REDUCTION ON CONTACTING SURFACES
Technical Paper Publication. DETC2017-67553

Robert Kuether, Peter Coffin, Adam Brink, *Sandia National Laboratories, Albuquerque, NM, USA*

PREDICTING DAMPING OF A CANTILEVER BEAM WITH A BOLTED JOINT USING QUASI-STATIC MODAL ANALYSIS
Student Competition Paper. DETC2017-67859

Emily Jewell, Matthew Allen, Robert Lacayo, *University of Wisconsin, Madison, WI, USA*

COMPARISON OF THE BOUC-WEN, MASING-HYPOTHESES, AND LUGRE MODELS
Technical Presentation. DETC2017-67920

Allen Mathis, *The University of Akron, Wadsworth, OH, USA,* ***D. Dane Quinn,*** *Akron, OH, USA*

TECHNICAL SESSIONS AT-A-GLANCE

— TUESDAY —

Room	8:00am – 9:00am	9:10am – 10:50am	11:00am – 12:00pm	2:00pm – 3:40pm	4:00pm – 5:40pm
Room 1 *Concourse Level*			**MR-10-1 ***		
Room 3 *Concourse Level*	CIE-9-1	CIE-9-2	**CIE-24-1 ***	**CIE-33-1 ***	
Room 4 *Concourse Level*	CIE-15-1	CIE-6-1	CIE-6-2	CIE-6-3	
Room 5 *Concourse Level*	**CIE-7-1 ***	CIE-4-1	**CIE-20-1 ***	CIE-5-1	
Room 6 *Concourse Level*	DAC-15-1	DAC-16-1	DAC-15-2	DAC-16-2	DAC-7-1
Room 7 *Concourse Level*	DAC-9-1	DAC-9-2	DAC-5-1	DAC-5-2	DAC-2-1
Room 8 *Exhibit Level*	DAC-12-1	DAC-19-2	DAC-11-2	DAC-6-1	DAC-6-2
Room 9 *Exhibit Level*	MR-4-5	MR-4-6		MR-4-7	MR-4-8
Room 10 *Exhibit Level*	MR-7-1	MR-7-2		MR-6-1	MR-7-3
Room 11 *Exhibit Level*	MR-8-5	MR-8-6		MR-8-7	MR-2-1
Room 12 *Exhibit Level*					
Room 13 *Exhibit Level*	MNS-8-1	MNS-8-2	**MNS-1-2 ***	MNS-2-1	MNS-2-2
Room 14 *Exhibit Level*	MESA-9-1	MESA-10-1	MESA-9-2	MESA-6-3	
Room 15 *Exhibit Level*		PTG-3-4		PTG-3-5	PTG-3-6
Room 16 *Exhibit Level*		PTG-2-1	**PTG-9-2 ***	PTG-2-2	PTG-2-3
Room 19 *Exhibit Level*	MESA-17-1	MESA-21-1	MESA-21-2	MESA-22-2	
Room 20 *Exhibit Level*	DTM-6-1	DTM-10-1	DTM-5-2	DTM-1-2	DTM-11-2
Room 21 *Exhibit Level*	DFMLC-3-1	DFMLC-14-1	DFMLC-3-2	DFMLC-5-1	
Room 22 *Exhibit Level*		DFMLC-4-1	DFMLC-4-2	DFMLC-8-1	
Room 23 *Exhibit Level*		**DEC-5-2 ***		DEC-2-1	
Room 24 *Exhibit Level*		**AVT-9-1 ***		AVT-3-2	AVT-4-1
Room 25A *Ballroom Level*	VIB-2-4	MSNDC-11-2		VIB-5-1	VIB-5-2
Room 25B *Ballroom Level*	VIB-4-1	MSNDC-5-3		VIB-9-2	
Room 25C *Ballroom Level*	MSNDC-4-2	VIB-6-2		VIB-15-2	VIB-15-3
Room 26A *Ballroom Level*	MSNDC-10-2	VIB-10-2	**VIB-1-2 ***	**MSNDC-17-1 ***	
Room 26B *Ballroom Level*	VIB-3-3	VIB-3-4			
Room 26C *Ballroom Level*		MSNDC-13-1	MSNDC-15-1		

TUESDAY, AUGUST 8, 2017

CIE-7-1: AMS PANEL: ADDITIVE MANUFACTURING IN AEROSPACE, DEFENSE AND AUTOMOTIVE INDUSTRIES: STATUS AND PROMISES

CONCOURSE LEVEL, ROOM 5 **8:00AM–9:00AM**

Session Organizer: **Seung Ki Moon,** *Nanyang Technological University, Singapore, Singapore*

DESIGN CHALLENGES & RESEARCH OPPORTUNITIES IN ADDITIVE MANUFACTURING: PERSPECTIVES FROM AN ADDITIVE MANUFACTURING DEMONSTRATION FACILITY

Timothy W. Simpson, *Penn State University, PA, USA*

INTEGRATED COMPUTATIONAL MATERIAL ENGINEERING (ICME) ACROSS MULTIPLE SCALES FOR FUNCTIONAL TAILORING OF ADDITIVELY MANUFACTURED PARTS

John Michopoulos, *Naval Research Laboratory*

CIE-9-1: EMOTIONAL ENGINEERING I

CONCOURSE LEVEL, ROOM 3 **8:00AM–9:00AM**

Session Organizer: **Shuichi Fukuda,** *Keio University, Musashino, Tokyo, Japan*

NATURAL FINGER INTERACTION FOR CAD ASSEMBLY MODELING
Technical Paper Publication. DETC2017-67555

Marius Fechter, *Friedrich-Alexander University Erlangen-Nürnberg, Engineering Design, Erlangen, Germany,* ***Sandro Wartzack,*** *Friedrich-Alexander-University Erlangen-Nuernberg, Erlangen, Germany*

LEARNING COORDINATION IN BODY MOTION CONTROL: A PATTERN BASED APPROACH
Technical Paper Publication. DETC2017-67435

Shuichi Fukuda, *Keio University, Musashino, Tokyo, Japan*

A STUDY ON METHODOLOGY TO MAKE TEAM: (METHODOLOGY: PHASE II)
Technical Paper Publication. DETC2017-67050

Yoichi Sugimoto, *Kagawa University, Takamatsu, Kagawa, Japan,* ***Masao Arakawa,*** *Kagawa University, Kagawa, Kagawa, Japan,* ***Masahiko Ishimaru,*** *The Open University of JAPAN, Chiba, Chiba, Japan*

CIE-15-1: SYSTEMS ENGINEERING

CONCOURSE LEVEL, ROOM 4 **8:00AM–9:00AM**

Session Organizer: **Douglas Allaire,** *Texas A&M University, College Station, TX, USA*

Session Co-Organizer: **Bryan O'Halloran,** *Naval Postgraduate School, Monterey, CA, USA*

A MODEL DRIVEN APPROACH FOR EARLY ASSESSMENT OF DEFENSE IN DEPTH CAPABILITIES OF COMPLEX SOCIOTECHNICAL SYSTEMS
Technical Paper Publication. DETC2017-67257

Nikolaos Papakonstantinou, *VTT Technical Research Centre of Finland, Espoo, Finland,* ***Teemu Tommila,*** *VTT Technical Research Centre of Finland, Tampere, Finland,* ***Bryan O'Halloran,*** *Naval Postgraduate School, Monterey, CA, USA,* ***Jarmo Alanen,*** *VTT Technical Research Centre of Finland, Tampere, Finland,* ***Douglas Van Bossuyt,*** *KTM Research, Tualatin, OR, USA*

AN ARCHITECTURE MODELING FRAMEWORK FOR DISTRIBUTED AUTOMATION SYSTEMS USING SYSML AND SEMANTIC WEB TECHNOLOGIES
Technical Paper Publication. DETC2017-67477

Yue Cao, Yusheng Liu, *Zhejiang University, Hangzhou, China,* ***Xiaoping Ye, Yamin Fang,*** *Lishui University, Lishui, China*

DAC-9-1: ENGINEERING FOR GLOBAL DEVELOPMENT (EGD) 1

CONCOURSE LEVEL, ROOM 7 **8:00AM–9:00AM**

Session Organizer: **Amos Winter,** *MIT, Cambridge, MA, USA*

Session Co-Organizer: **Christopher A. Mattson,** *Brigham Young University, Provo, UT, USA*

DESIGN EXPLORATION OF AFFORDABLE REFRESHABLE BRAILLE DISPLAY TECHNOLOGY FOR LOW-INCOME VISUALLY IMPAIRED USERS
Technical Paper Publication. DETC2017-67247

Anthony S. Walker, *Penn State Behrend, Erie, PA, USA,* ***Shraddha Sangelkar,*** *Penn State Erie, The Behrend College, Erie, PA, USA*

DETERMINATION OF RESISTANCE FACTOR FOR TORTUOUS PATHS IN DRIP EMITTERS
Technical Paper Publication. DETC2017-67895

Jaya Narain, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Amos Winter,*** *MIT, Cambridge, MA, USA*

AN ASSESSMENT OF VILLAGE DRILL SUSTAINABILITY, WITH RECOMMENDATIONS
Technical Paper Publication. DETC2017-67581

Andrew Pack, *Christopher A. Mattson, Brigham Young University, Provo, UT, USA*

DAC-12-1: GEOMETRIC MODELING AND ALGORITHMS FOR DESIGN AND MANUFACTURING

CONCOURSE LEVEL, ROOM 8 **8:00AM–9:00AM**

Session Organizer: **Shikui Chen,** *State University of New York at Stony Brook, Stony Brook, NY, USA*

Session Co-Organizer: **Michael Kokkolaras,** *McGill University, Montreal, QC, Canada*

AUTOMATED ASSEMBLY STABILITY EVALUATION BY THEORETICAL AND PHYSICS SIMULATION METHOD
Technical Paper Publication. DETC2017-68125

Weifeng Huang, Nima Rafibakhsh, Christopher Hoyle, Matthew Campbell, *Oregon State University, Corvallis, OR, USA*

AUTOMATED DESIGN OF CLOSED-DIE FORGINGS
Technical Paper Publication. DETC2017-68148

Brandon Massoni, Matthew Campbell, *Oregon State University, Corvallis, OR, USA*

DAC-15-1: MULTI-OBJECTIVE OPTIMIZATION AND SENSITIVITY ANALYSIS 1

CONCOURSE LEVEL, ROOM 6 **8:00AM–9:00AM**

Session Organizer: **Mian Li,** *Shanghai Jiao Tong University, Shanghai, China*

Session Co-Organizer: **Daniel Selva,** *Cornell University, Ithaca, NY, USA*

A NORMALIZED CIRCLE INTERSECTION METHOD FOR BI-OBJECTIVE OPTIMIZATION PROGRAMMING
Technical Paper Publication. DETC2017-68101

Jianhua Zhou, Tingting Xia, Mian Li, Min Xu, *Shanghai Jiao Tong University, Shanghai, China*

A MULTI-OBJECTIVE AND MULTI-LEVEL DESIGN OPTIMIZATION METHOD FOR OIL & GAS DUCTS
Technical Paper Publication. DETC2017-67977

Paolo Cicconi, Vincenzo Castorani, Michele Germani, *Università Politecnica Delle Marche, Ancona, AN, Italy,* ***Marco Mandolini,*** *Università Politecnica Delle Marche, Italy,* ***Alessio Vita,*** *Università Politecnica delle Marche, ANCONA, Italy*

DFMLC-3-1: LIFE CYCLE DECISION MAKING

EXHIBIT HALL LEVEL, ROOM 21 **8:00AM–9:00AM**

Session Organizer: **Marcos Esterman,** *Rochester Institute of Technology, Rochester, NY, USA*

Session Co-Organizer: **Koki Ho,** *University of Illinois at Urbana-Champaign, Champaign, IL, USA*

VALUE OF BOOTSTRAPPING STAGED DEPLOYMENT OF INFRASTRUCTURE: CASE STUDY IN SPACE INFRASTRUCTURE DEPLOYMENT
Technical Paper Publication. DETC2017-67610

Koki Ho, *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***Hao Chen, Harrison Kim,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

USAGE OF PRODUCT LIFECYCLE DATA TO DETECT HARD DISK DRIVES FAILURE FACTORS
Technical Paper Publication. DETC2017-67973

Praveen Kumare Gopalakrishnan, *University at Buffalo, State University of New York, Amherst, NY, USA,* ***Sara Behdad,*** *University at Buffalo, SUNY, New York, United Kingdom*

A METHODOLOGY TO QUANTIFY CUMULATIVE DAMAGE FUNCTION (CDF) FOR INTEGRATION INTO AN OBJECT-ORIENTED LIFE CYCLE ASSESSMENT (LCA)
Technical Paper Publication. DETC2017-68282

Devdatta Deo, Marcos Esterman, Brian Thorn, *Rochester Institute of Technology, Rochester, NY, USA*

DTM-6-1: DESIGN AND ENERGY SYSTEMS

EXHIBIT HALL LEVEL, ROOM 20 **8:00AM–9:00AM**

Session Organizer: **Erin MacDonald,** *Stanford University, Stanford, CA, USA*

Session Co-Organizer: **Michel-Alexandre Cardin,** *National University of Singapore, Singapore*

ORIGINS OF DESIGN PRINCIPLES : THE CASE OF NUCLEAR REACTOR DESIGN PROJECTS
Technical Paper Publication. DETC2017-67437

Aditi Verma, *Massachusetts Institute of Technology, Cambridge, MA, USA*

FLEXIBILITY AND REAL OPTIONS ANALYSIS IN DESIGN FOR LONG TERM GENERATION EXPANSION PLANNING OF POWER GRID SYSTEMS
Technical Paper Publication. DETC2017-67494

Muhammad Rahmat, Aakil Mohammad Caunhye, Michel-Alexandre Cardin, *National University of Singapore, Singapore*

A FRAMEWORK FOR WIND ENERGY CONVERSION TO PROMOTE SUSTAINABILITY IN PRODUCT DESIGN
Technical Paper Publication. DETC2017-68393

Zachary Ball, *University at Buffalo, SUNY, Amherst, NY, USA,* ***Joe Szabo,*** *University at Buffalo, State University, Buffalo, NY, USA,* ***Felipe Pasquali, John Hall,*** *University at Buffalo, Buffalo, NY, USA*

MR-4-5: PANEL THICKNESS

EXHIBIT HALL LEVEL, ROOM 9 **8:00AM–9:00AM**

Session Organizer: **Zhong You,** *University of Oxford, Oxford, United Kingdom*

Session Co-Organizer: **Suyi Li,** *Clemson University, Clemson, SC, USA*

SPLIT-VERTEX TECHNIQUE FOR THICKNESS-ACCOMMODATION IN ORIGAMI-BASED MECHANISMS

Technical Paper Publication. DETC2017-68018

Kyler Tolman, *Brigham Young University, Provo, UT, USA,* ***Robert Lang,*** *Robert J. Lang Origami, Alamo, CA, USA,* ***Spencer P. Magleby,*** *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

FLAT-FOLDABLE BOXES OF THICK PANELS: HINGES AND SUPPORTERS

Technical Paper Publication. DETC2017-67395

Chie Nara, *Meiji University, Tokyo, Japan,* ***Ichiro Hagiwara,*** *Meiji University, Kanagawa 247, Tokyo, Japan,* ***Yang Yang, Xiaoshi Chen,*** *Meiji University, Tokyo, Japan*

FOLDING THICK MATERIAL USING AXIALLY VARYING VOLUME TRIMMING

Technical Paper Publication. DETC2017-67577

Jason S. Ku, *MIT, Cambridge, MA, USA*

MR-7-1: PROSTHESES AND EXOSKELETONS

EXHIBIT HALL LEVEL, ROOM 10 **8:00AM–9:00AM**

Session Organizer: **James Schmiedeler,** *University of Notre Dame, Notre Dame, IN, USA*

Session Co-Organizer: **Pranav Bhounsule,** *University of Texas at San Antonio, San Antonio, TX, USA*

DEVELOPMENT OF A PASSIVE AND SLOPE ADAPTABLE PROSTHETIC FOOT

Technical Paper Publication. DETC2017-67947

David E. Amiot, Erich P. Meinig, Angwei Law, Rachel Schmidt, Lynn Yu, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Kathryn Olesnavage, Victor Prost,*** *Amos Winter, MIT, Cambridge, MA, USA*

A PASSIVE ANKLE-FOOT PROSTHESIS WITH ENERGY RETURN TO MIMIC ABLE-BODIED GAIT

Technical Paper Publication. DETC2017-67192

Robert Holgate, *SpringActive, Inc., Tempe, AZ, USA,* ***Thomas Sugar,*** *Arizona State University, Tempe, AZ, USA,* ***Edwin Santos,*** *Arizona State University, Phoenix, AZ, USA,* ***Audrey Nash,*** *Arizona State University, Tempe, AZ, USA,* ***Jasper Kianpour,*** *Arizona State University, Phoenix, AZ, USA,* ***Craig Trevor Johnson,*** *Arizona State University, Mesa, AZ, USA*

DESIGN OF A PARALLEL ARCHITECTURE ROBOTIC SPINE EXOSKELETON WITH SERIES ELASTIC ACTUATORS

Technical Paper Publication. DETC2017-67842

Chawin Ophaswongse, Rosemarie C. Murray, Sunil K. Agrawal, *Columbia University, New York, NY, USA*

MR-8-5: WHEELED ROBOTS

EXHIBIT HALL LEVEL, ROOM 11 **8:00AM–9:00AM**

Session Organizer: **Hai-Jun Su,** *The Ohio State University, Columbus, OH, USA*

Session Co-Organizer: **Dan Zhang,** *York University, Toronto, ON, Canada*

DESIGN OF A MULTI-DIRECTIONAL HYBRID-LOCOMOTION MODULAR ROBOT WITH FEEDFORWARD STABILITY CONTROL

Technical Paper Publication. DETC2017-67436

Prashant Kumar, Wael Saab, Pinhas Ben-Tzvi, *Virginia Tech, Blacksburg, VA, USA*

DESIGN OF TRACK-BASED CLIMBING ROBOTS USING DRY ADHESIVES

Technical Paper Publication. DETC2017-67999

Matthew Powelson, *Tennessee Tech, Cookeville, TN, USA,* ***Stephen Canfield,*** *Tennessee Technological University, Cookeville, TN, USA*

THE METHOD OF MODELING OF A NOVEL 6-DOF PARALLEL MANIPULATOR AS A GENERALIZED VIRTUAL ROAD VEHICLE FOR ON-BOARD EQUIPMENT TEST

Technical Paper Publication. DETC2017-67491

*Y****an Hu, Feng Gao, Rui Cao, Xianchao Zhao,*** *Shanghai Jiao Tong University, Shanghai, China*

MNS-8-1: MEASUREMENTS OF MULTI-PHYSICAL SURFACE INTERACTIONS USING AFM

[Cross-listed with VIB-12]

EXHIBIT HALL LEVEL, ROOM 13 **8:00AM–9:00AM**

Session Organizer: **Hanna Cho,** *The Ohio State University, Columbus, OH, USA*

RETRIEVING PROPERTIES OF VISCOELASTIC MATERIALS WITH MULTIPLE CHARACTERISTIC TIMES THROUGH STATIC AND DYNAMIC ATOMIC FORCE MICROSCOPY

Technical Presentation. DETC2017-67269

Enrique Lopez-Guerra, *The George Washington University, Washington D.C., USA,* ***Santiago Solares,*** *The George Washington University, Washington, DC, USA*

MEASUREMENT OF MULTI-PHYSICAL PROPERTIES IN ATOMIC FORCE MICROSCOPY USING A DUAL FREQUENCY CANTILEVER DESIGN

Technical Presentation. DETC2017-68524

Sajith Dharmasena, *Ohio State University, Columbus, OH, USA,* ***Seok Kim,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Lawrence Bergman,*** *University of Illinois/Urbana, IL, USA,* ***Alexander Vakakis,*** *University of Illinois, Urbana, IL, USA,* ***Hanna Cho,*** *The Ohio State University, Columbus, OH, USA*

MEASURING ELECTRO-MECHANO-CHEMICAL OXIDATION AND REDUCTION REACTIONS ON GRAPHENE USING AFM: PROBING THE RELATIONSHIP BETWEEN STRESS, STRAIN, AND REACTIVITY AT THE NANOMETER SCALE
Technical Presentation. DETC2017-68541

Shivaranjan Raghuraman, Jonathan Felts, *Texas A&M University, College Station, TX, USA*

MESA-9-1: MECHATRONIC CONTROL AND ELECTRICAL VEHICULAR SYSTEMS (MCEVS) I

EXHIBIT HALL LEVEL, ROOM 14 **8:00AM–9:00AM**

Session Organizer: **Ferenc Szauter,** *Szechenyi Istvan University, Gyor, Hungary*

Session Co-Organizer: **Daniel Pup,** *Szechenyi Istvan University, Gyor, Hungary*

REAL-TIME MODELING TO ENABLE HARDWARE-IN-THE-LOOP SIMULATION OF PLUG-IN ELECTRIC VEHICLE-GRID INTER-ACTION
Student Competition Paper. DETC2017-67390

Chong Cao, Luting Wang, Bo Chen, *Michigan Technological University, Houghton, MI, USA,* ***Jason Harper, Theodore Bohn, Daniel Dobrzynski, Keith Hardy,*** *Argonne National Laboratory, Argonne, IL, USA*

MAXIMIZING BATTERY LIFE AND USABLE CAPACITY WITH BATTERY MANAGEMENT SYSTEM IN ELECTRIC VEHICLES
Technical Paper Publication. DETC2017-67939

Zoltan Szeli, Gabor Szakallas, Ferenc Szauter, *Szechenyi Istvan University, Gyor, Hungary*

TWO OPERATING STATES-BASED LOW ENERGY CONSUMPTION VEHICLE CONTROL
Technical Paper Publication. DETC2017-67978

Peter Koros, Erno Horvath, *Szechenyi Istvan University, Gyor, Hungary,* ***István Lakatos,*** *Széchenyi István University, Gyor, Hungary,* ***Ferenc Szauter,*** *Szechenyi Istvan University, Gyor, Hungary*

MESA-17-1: SMALL UNMANNED AERIAL VEHICLE TECHNOLOGIES AND APPLICATIONS (SUAVTA)

EXHIBIT HALL LEVEL, ROOM 19 **8:00AM–9:00AM**

Session Organizer: **Yangquan Chen,** *University of California Merced, Merced, CA, USA*

DISTRIBUTED ADAPTIVE FAULT-TOLERANT COOPERATIVE CONTROL FOR MULTI-UAVS AGAINST ACTUATOR-SENSOR FAULTS
Technical Paper Publication. DETC2017-67637

Ziquan Yu, Yaohong Qu, *Northwestern Polytechnical University, Xi'an, China,* ***Youmin Zhang,*** *Mechanical & Industrial Eng, Concordia University, Montreal, QC, Canada,* ***Yintao Zhang,*** *Concordia University, Montreal, QC, Canada*

QUANTIFYING ALMOND WATER STRESS USING UNMANNED AERIAL VEHICLES (UAVS): CORRELATION OF STEM WATER POTENTIAL AND HIGHER ORDER MOMENTS OF NON-NORMALIZED CANOPY DISTRIBUTION
Technical Paper Publication. DETC2017-68246

Tiebiao Zhao, *University of California, Merced, Atwater, CA, USA,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA,* ***Andrew Ray,*** *David Doll, UC ANR, MERCED, CA, USA*

MSNDC-4-2: CONTACT AND INTERFACE DYNAMICS

[Cross-listed with VIB-6]

BALLROOM LEVEL, ROOM 25C **8:00AM–9:00AM**

Session Organizer: **Arman Pazouki,** *California State University, Los Angeles, Los Angeles, CA, USA*

Session Co-Organizer: **Paulo Flores,** *University of Minho, Guimaraes, Portugal*

A STUDY ON DYNAMIC CHARACTERISTICS OF ELEVATOR LINK TYPE DOOR SYSTEMS AND THE ROBUST DESIGN OPTIMIZATION
Technical Presentation. DETC2017-67140

Yisug Kwon, *Otis Elevator, Farmington, CT, USA,* ***Duk-jin Yun,*** *Functionbay Inc, Seoul, GyeongKi, Korea (Republic)*

IMPACT MECHANICS PARAMETRIC STUDIES WITH APPLICATIONS TO DYNAMIC FORCE CALIBRATION
Technical Paper Publication. DETC2017-67893

Nicholas Vlajic, Ako Chijioke, *National Institute of Standards and Technology, Gaithersburg, MD, USA*

NONLINEAR MODAL ANALYSIS OF A ONE-DIMENSIONAL BAR UNDERGOING UNILATERAL CONTACT VIA THE TIME DOMAIN BOUNDARY ELEMENT METHOD
Technical Paper Publication. DETC2017-68340

Jayantheeswar Venkatesh, *McGill University, Montréal, QC, Canada,* ***Mathias Legrand,*** *McGill University, Montreal, QC, Canada,* ***Anders Thorin,*** *McGill University, Montréal, QC, Canada*

MSNDC-10-2: MODELING, SIMULATION, AND VALIDATION OF VEHICLE DYNAMICS – 2

[Cross-listed with VIB-10]

BALLROOM LEVEL, ROOM 26A **8:00AM–9:00AM**

Session Organizer: **Paramsothy Jayakumar,** *U.S. Army RDECOM TARDEC, Warren, MI, USA*

Session Co-Organizer: **Werner Schiehlen,** *University of Stuttgart, Germany, Hiroyuki Sugiyama, The University of Iowa, Iowa City, IA, USA*

AN OVERVIEW OF A CONNECTED AUTONOMOUS VEHICLE EMULATOR (CAVE)
Student Competition Paper. DETC2017-68322

Asher Elmquist, Dylan Hatch, *University of Wisconsin, Madison, WI, USA,* ***Radu Serban,*** *University of Wisconsin, Madison, WI, USA,* ***Dan Negrut,*** *University of Wisconsin, Madison, WI, USA*

CONTINUUM FINITE ELEMENT TIRE-SOIL INTERACTION MODEL FOR OFF-ROAD MOBILITY SIMULATION AND EXPERIMENTAL VALIDATION
Technical Presentation. DETC2017-68444

Hiroki Yamashita, *The University of Iowa, Iowa City, IA, USA,* ***Paramsothy Jayakumar,*** *U.S. Army RDECOM TARDEC, Warren, MI, USA,* ***Mustafa Alsaleh,*** *Caterpillar Inc., Mossville, IL, USA,* ***Hiroyuki Sugiyama,*** *The University of Iowa, Iowa City, IA, USA*

HIGH ORDER ANCF BEAM ELEMENT: INTEGRATION WITH COMPUTER AIDED DESIGN AND APPLICATION IN LEAF SPRING MODELING
Technical Presentation. DETC2017-68507

Zuqing Yu, Peng Lan, *Harbin Institute of Technology, Harbin, China*

VIB-2-4: STRUCTURES AND CONTINUOUS SYSTEMS IV

BALLROOM LEVEL, ROOM 25A **8:00AM–9:00AM**

Session Organizer: **Weidong Zhu,** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

Session Co-Organizer: **Ebrahim Esmailzadeh,** *University of Ontario Inst of Tech, Oshawa, ON, Canada*

STRUCTURAL SHAPE RECONSTRUCTION OF FBG FLEXIBLE PLATE USING MODAL SUPERPOSITION METHOD
Technical Paper Publication. DETC2017-67316

Li Li, Ben S. Zhong, Zi Y. Geng, Wei Sun, *Shanghai University, Shanghai, China*

A NEW LOCKING-FREE FORMULATION OF A THREE-DIMENSIONAL SHEAR-DEFORMABLE BEAM
Student Competition Paper. DETC2017-67598

Wei Fan, *Harbin Institute of Technology, Harbin, China,* ***Weidong Zhu,*** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

INTERACTION OF HIGHER MODES IN NONLINEAR FREE VIBRATION OF STIFFENED RECTANGULAR PLATES
Technical Paper Publication. DETC2017-68211

Saman Farhangdoust, *Technical University of Catalonia, Barcelona, Barcelona, Spain,* ***Davood Younesian,*** *Iran University of Science and Technology, Tehran, Tehran, Iran,* ***Ebrahim Esmailzadeh,*** *University of Ontario Inst of Tech, Oshawa, ON, Canada*

VIB-3-3: VIBRATION CONTROL AND SMART STRUCTURES II

[Cross-listed with MSNDC-2]

BALLROOM LEVEL, ROOM 26B **8:00AM–9:00AM**

Session Organizer: **Lei Zuo,** *Virginia Tech, Blacksburg, VA, USA*

Session Co-Organizer: **Alper Erturk,** *Georgia Institute of Technology, Atlanta, GA, USA*

ON ENERGY HARVESTING AND CONTROL OF A NON-IDEAL SYSTEM WITH AUTOPARAMETRIC VIBRATION ABSORBER SYSTEM
Technical Paper Publication. DETC2017-67526

Jorge Luis Palacios Felix, *Federal University of Fronteira Sul, Cerro Largo, Rio Grande do Sul, Brazil,* ***Jose Manoel Balthazar,*** *Aeronautics Technological Institute, São José dos Campos, Brazil,* ***Rodrigo Tumolin Rocha, Angelo M Tusset, Frederic Conrad Janzen,*** *Federal University of Technology–Parana, Ponta Grossa, Parana, Brazil*

MULTI-RESONANT ELECTROMAGNETIC SHUNT DAMPERS FOR VIBRATION SUPPRESSION
Technical Paper Publication. DETC2017-67559

Yalu Pei, Lei Zuo, *Virginia Tech, Blacksburg, VA, USA*

THERMODYNAMIC VARIATIONAL FORMULATIONS OF SUBORDINATE OSCILLATOR ARRAYS (SOA) WITH LINEAR PIEZOELECTRICS
Technical Paper Publication. DETC2017-68056

Sai Tej Paruchuri, Andrew J. Kurdila, *Virginia Tech, Blacksburg, VA, USA,* ***John Sterling,*** *Catholic University of America, Washington, DC, USA,* ***Amelia Vignola,*** *Catholic University of America, Washington, DC, DC, USA,* ***John Judge,*** *Catholic University of America, Severna Park, MD, USA,* ***Joseph Vignola,*** *CUA, Washington, D.C., DC, USA,* ***Teresa Ryan,*** *East Carolina University, Greenville, NC, USA*

VIB-4-1: NONLINEAR SYSTEMS AND PHENOMENA I

[Cross-listed with MSNDC-5]

BALLROOM LEVEL, ROOM 25B **8:00AM–9:00AM**

Session Organizer: **Stefano Lenci,** *Polytechnic University of Marche, Ancona, Italy*

NONLINEAR OSCILLATIONS OF HYPERELASTIC ANNULAR MEMBRANES WITH VARYING DENSITY
Technical Paper Publication. DETC2017-67189

Renata Soares, *Federal University of Goias, Goiania, Brazil,* ***Paulo B. Goncalves,*** *Pontifical Catholic University, Puc-Rio, Rio De Janeiro, Brazil*

NONLINEAR DYNAMIC BEHAVIOR OF ORIGAMI-BASED MULTI-CELL STRUCTURES
Technical Presentation. DETC2017-67457

Richard Wiebe, *University of Washington, Seattle, WA, USA,* ***Jinkyu Yang,*** *University of Washington, Seattle, WA, USA,* ***Hiromi Yasuda,*** *University of Washington, Seattle, WA, USA*

DYNAMICS OF HIGHLY NON-STATIONARY REGIMES IN THE DUFFING OSCILLATOR SUBJECT TO BI-HARMONIC PARAMETRIC EXCITATION
Technical Presentation. DETC2017-67954

Victor Kislovsky, Yuli Starosvetsky, *Technion, Haifa, Israel*

AVT-9-1: MILLIKEN LECTURE

EXHIBIT HALL LEVEL, ROOM 24 **9:10AM–10:50AM**

Session Organizer: **Vladimir V. Vantsevich,** *The University of Alabama at Birmingham, Birmingham, AL, USA*

TRACING THE ORIGINS OF THE AUTOMATED 'FLY-BY-WIRE' TECHNOLOGY USED IN CONTEMPORARY FORMULA 1 CARS

Martin Jones, *Moog Industrial Group*

SESSION CIE-4-1: UNCERTAINTY QUANTIFICATION IN SIMULATION AND MODEL VERIFICATION

CONCOURSE LEVEL, ROOM 5 **9:10AM–10:50AM**

Session Organizer: **Yan Wang,** *Georgia Institute of Technology, Atlanta, GA, USA*

UNCERTAINTY QUANTIFICATION AND VALIDATION OF LATTICE STRUCTURES FABRICATED BY SELECTIVE LASER MELTING
Technical Paper Publication. DETC2017-67438

Recep Gorguluarslan, *Georgia Institute of Tech., Atlanta, GA, USA,* ***Seung-Kyum Choi,*** *Georgia Tech, Atlanta, GA, USA,* ***Hae-jin Choi,*** *Chung Ang University, Seoul, Korea (Republic)*

TOWARDS MODEL ORDER REDUCTION FOR UNCERTAINTY PROPAGATION IN BLAST-INDUCED TRAUMATIC BRAIN INJURY
Technical Paper Publication. DETC2017-67556

Athanasios Iliopoulos, *US Naval Research Laboratory, Washington, DC, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA,* ***Philip Avery,*** *Stanford, Stanford, CA, USA,* ***Charbel Farhat,*** *Stanford University, Stanford, CA, USA,* ***Kirubel Teferra,*** *U.S. Naval Research Laboratory, Washington, DC, USA,* ***Siddiq Qidwai,*** *National Science Foundation, Arlington, VA, USA*

SEQUENTIAL DECISION PROCESS FOR TRADESPACE EXPLORATION BY BOUNDING PROBABILISTIC DECISION CRITERIA USING MEAN-RISK ANALYSIS
Technical Paper Publication. DETC2017-68112

Jaskanwal P. S. Chhabra, Gordon P. Warn, *The Pennsylvania State University, State College, PA, USA*

AN ENSEMBLE BIAS-CORRECTION METHOD WITH ADAPTIVE WEIGHTS FOR DYNAMIC MODELING OF LITHIUM-ION BATTERIES
Technical Paper Publication. DETC2017-68416

Yifei Li, Mohammadkazem Sadoughi, Zhixiong Li, Chao Hu, *Iowa State University, Ames, IA, USA*

CALIBRATION AND VALIDATION OF A TIME-DEPENDENT TEMPERATURE FIELD MODEL FOR STEEL SLABS IN A REHEATING FURNACE
Technical Paper Publication. DETC2017-68429

Xiaoxu Dong, Zhimin Xi, *University of Tennessee, Knoxville, Knoxville, TN, USA,* ***Jian Shao, Anrui He,*** *University of Science & Technology Beijing, Beijing, China*

CIE-6-1: AMS/SEIKM/CAPPD: DESIGN, SIMULATION AND OPTIMIZATION FOR ADDITIVE MANUFACTURING I

CONCOURSE LEVEL, ROOM 4 **9:10AM–10:50AM**

Session Organizer: **Paul Witherell,** *NIST, Gaithersburg, MD, USA*

LATTICE STRUCTURE DESIGN ADVISOR FOR ADDITIVE MANUFACTURING USING GAUSSIAN PROCESS
Technical Paper Publication. DETC2017-67282

Tsz Ling Elaine Tang, *Siemens Corporate Technology, Princeton, NJ, USA,* ***Yan Liu,*** *Lehigh University, Bethlehem, PA, USA,* ***Da Lu,*** *MSC Software Corporation, Newport Beach, CA, USA,* ***Erhan B. Arisoy, Suraj Musuvathy,*** *Siemens Corporate Technology, Princeton, NJ, USA*

COMPARISON OF AS-BUILT FEA SIMULATIONS AND EXPERIMENTAL RESULTS FOR ADDITIVELY MANUFACTURED DOG-BONE GEOMETRIES
Technical Paper Publication. DETC2017-67538

Prathamesh Baikerikar, Cameron Turner, *Clemson University, Clemson, SC, USA*

TOWARDS A CONSTITUTIVE MODEL THAT ENCAPSULATES MICROSTRUCTURAL FEATURES INDUCED BY POWDER ADDITIVE MANUFACTURING
Technical Paper Publication. DETC2017-67591

Ajit Achuthan, *Clarkson University, Potsdam, NY, USA,* ***Athanasios Iliopoulos,*** *US Naval Research Laboratory, Washington, DC, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA,* ***Robert Saunders,*** *US Naval Research Laboratory, Washington, DC, USA,* ***Amit Bagchi,*** *Naval Research Laboratory, Washington, DC, USA*

MESOSCALE MULTI-PHYSICS SIMULATION OF SOLIDIFICATION IN SELECTIVE LASER MELTING PROCESS USING A PHASE FIELD AND THERMAL LATTICE BOLTZMANN MODEL
Technical Paper Publication. DETC2017-67633

Dehao Liu, Yan Wang, *Georgia Institute of Technology, Atlanta, GA, USA*

RECENT DEVELOPMENTS OF THE MULTIPHYSICS DISCRETE ELEMENT METHOD FOR ADDITIVE MANUFACTURING MODELING AND SIMULATION
Technical Paper Publication. DETC2017-67597

John Steuben, *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***Athanasios Iliopoulos,*** *US Naval Research Laboratory, Washington, DC, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA*

CIE-9-2: EMOTIONAL ENGINEERING II

CONCOURSE LEVEL, ROOM 3 **9:10AM–10:50AM**

Session Organizer: **Hideki Aoyama,** *Keio University, Yokohama, Japan*

A PRELIMINARY TOOL TO SUPPORT SHOPPING EXPERIENCE DESIGN
Technical Paper Publication. DETC2017-67208

Silvia Ceccacci, Andrea Generosi, Luca Giraldi, Maura Mengoni, *Università Politecnica delle Marche, Ancona, Ancona, Italy*

FROM MINING AFFECTIVE STATES TO MINING FACIAL KEYPOINT DATA: THE QUEST TOWARDS PERSONALIZED FEEDBACK
Technical Paper Publication. DETC2017-67340

Christian E. Lopez, *Penn State University, University Park, PA, USA,* ***Conrad Tucker,*** *Penn State University, State College, PA, USA*

DIGITAL DESIGN METHOD OF DYEING PATTERNS BASED ON KANSEI
Technical Paper Publication. DETC2017-67244

Yohei Ichimura, *Keio University, Yokohama, Kanagawa, Japan,* ***Hideki Aoyama,*** *Keio University, Yokohama 223-8522, Japan*

BASIC STUDY ON DEVELOPMENT OF DELIGHT DESIGN METHOD – PROPOSAL AND APPLICATION OF BEER CUP DESIGN METHOD BASED ON VALUE MODEL AND EVALUATION MODEL OF KANSEI –
Technical Paper Publication. DETC2017-68089

Yukako Tanaka, Mai Misaka, *Keio University, Kanagawa, Japan,* ***Hideki Aoyama,*** *Keio University, Yokohama Japan*

DAC-9-2: ENGINEERING FOR GLOBAL DEVELOPMENT (EGD) 2

CONCOURSE LEVEL, ROOM 7 **9:10AM–10:50AM**

Session Organizer: **Amy Bilton,** *University of Toronto, Toronto, ON, Canada*

Session Co-Organizer: **Nathan Johnson,** *Arizona State University, Mesa, AZ, USA*

VILLAGE-SCALE ELECTRODIALYSIS DESALINATION: FIELD TRIAL VALIDATION
Technical Paper Publication. DETC2017-68410

Natasha Wright, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Amos Winter,*** *MIT, Cambridge, MA, USA*

DESIGN AND TESTING OF A HIGH-EFFICIENCY RAPID THROUGHPUT COMMUNITY-SCALE WATER PASTEURIZATION SYSTEM
Technical Paper Publication. DETC2017-67830

Nordica MacCarty, Grace Burleson, Nicholas Moses, Tejas Mulky, Joshua Johnson, Elizabeth Andreyka, *Oregon State University, Corvallis, OR, USA,* ***Damon Ogle, Fred Colgan, Adam Creighton,*** *InStove, Cottage Grove, OR, USA,* ***Tom Carter,*** *Agua Pura El Pueblo, Happy Valley, OR, USA,* ***Dale Andreatta,*** *Sea Inc, Columbus, OH, USA*

TOWARDS A UNIVERSAL SOCIAL IMPACT METRIC FOR ENGINEERED PRODUCTS THAT ALLEVIATE POVERTY
Technical Paper Publication. DETC2017-67584

Phillip Stevenson, Christopher A. Mattson, *Brigham Young University, Provo, UT, USA,* ***Kenneth Mark Bryden,*** *Iowa State University, Ames, IA, USA,* ***Nordica MacCarty,*** *Oregon State University, Corvallis, OR, USA*

LONG-TERM PERFORMANCE EVALUATION OF AQUACULTURE SOLAR AERATION SYSTEM FOR DEVELOPING WORLD
Technical Paper Publication. DETC2017-68111

Sami Yamanidouzisorkhabi, Ahmed Mahmoud, Shakya Sur, *University of Toronto, Toronto, ON, Canada,* ***Elan Pavlov,*** *Curiousitate Inc., Cambridge, MA, USA,* ***Amy Bilton,*** *University of Toronto, Toronto, ON, Canada*

A SIMPLE STARTING POINT FOR DESIGNING FOR AND/OR ASSESSING THE SOCIAL IMPACT OF PRODUCTS
Technical Paper Publication. DETC2017-67586

Hans Ottosson, Emma Hirschi, Christopher A. Mattson, Eric Dahlin, *Brigham Young University, Provo, UT, USA*

DAC-16-1: MULTIDISCIPLINARY DESIGN OPTIMIZATION 1

CONCOURSE LEVEL, ROOM 6 **9:10AM–10:50AM**

Session Organizer: **Po Ting Lin,** *National Taiwan University of Science and Technology, Taipei, Taiwan*

Session Co-Organizer: **Hongyi Xu,** *Ford, Dearborn, MI, USA*

AN ON-LINE MULTI-FIDELITY METAMODEL ASSISTED MULTI-OBJECTIVE GENETIC ALGORITHM
Technical Paper Publication. DETC2017-67813

Qi Zhou, Yan Wang, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Seung-Kyum Choi,*** *Georgia Tech, Atlanta, GA, USA,* ***Ping Jiang,*** *Huazhong University of Science & Technology, Wuhan, Hubei, China*

A REFERENCE ERROR FORMULATION FOR MULTI-FIDELITY DESIGN OPTIMIZATION
Technical Paper Publication. DETC2017-67843

Ahmed Bayoumy, Michael Kokkolaras, *McGill University, Montreal, QC, Canada*

ENHANCED GAUSSIAN PROCESS METAMODELING AND COLLABORATIVE OPTIMIZATION FOR VEHICLE SUSPENSION DESIGN OPTIMIZATION
Technical Paper Publication. DETC2017-67976

Siyu Tao, Kohei Shintani, Ramin Bostanabad, Yu-Chin Chan, *Northwestern University, Evanston, IL, USA,* ***Guang Yang, Herb Meingast,*** *Toyota Motor North America, Inc., Ann Arbor, MI, USA,* ***Wei Chen,*** *Northwestern University, Evanston, IL, USA*

MULTI-LEVEL VALUE-DRIVEN DESIGN APPROACHES FOR PRODUCT FAMILY DESIGN
Technical Paper Publication. DETC2017-67432

Sangjin Jung, Timothy W. Simpson, *Penn State University, University Park, PA, USA,* ***Christina Bloebaum,*** *Iowa State University/Dept of Aerospace Eng, Ames, IA, USA*

SIMULATION AND DESIGN OPTIMIZATION OF A TALL-FORM SPRAY DRYER
Technical Paper Publication. DETC2017-67372

Joanna Tess Masilungan-Manuel, Allan N. Soriano, *Mapúa Institute of Technology, Manila, Philippines,* ***Mark Christian E. Manuel,*** *Mapua Institute of Technology, Manila, Philippines,* ***Po Ting Lin,*** *National Taiwan University of Science and Technology, Taipei, Taiwan*

DAC-19-2: SIMULATION-BASED DESIGN UNDER UNCERTAINTY 2

CONCOURSE LEVEL, ROOM 8 **9:10AM–10:50AM**

Session Organizer: **Xiaoping Du,** *Missouri University of Science and Technology, Rolla, MO, USA*

Session Co-Organizer: **Ikjin Lee,** *KAIST, Daejeon, Korea (Republic)*

MANAGEMENT OF SAMPLING UNCERTAINTY USING CONSERVATIVE ESTIMATE OF PROBABILITY IN BAYESIAN NETWORK
Technical Paper Publication. DETC2017-67620

Sangjune Bae, Nam Ho Kim, *University of Florida, Gainesville, FL, USA,* ***Seung-gyo Jang,*** *Agency for Defense Development, Daejeon, Daejeon, Korea (Republic)*

EXPLORATION OF SOLUTION SPACE TO STUDY THERMO-MECHANICAL BEHAVIOR OF AA5083 AL-ALLOY DURING HOT ROLLING PROCESS
Technical Paper Publication. DETC2017-68173

Anand Balu Nellippallil, *University of Oklahoma, Norman, OK, USA,* ***Rishabh Shukla,*** *Tata Consultancy Services, Pune, India,* ***Surya Ardham,*** *Tata Consultancy Service Research, Pune, India,* ***Chung Hyun Goh,*** *University of Texas, Tyler, TX, USA,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

OPTIMIZATION UNDER UNCERTAINTY VERSUS ALGEBRAIC HEURISTICS: A RESEARCH METHOD FOR COMPARING COMPUTATIONAL DESIGN METHODS
Technical Paper Publication. DETC2017-68371

William Binder, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Christiaan Paredis,*** *Georgia Institute of Technology, Atlanta, GA, USA*

HIGH-DIMENSIONAL RELIABILITY ANALYSIS OF ENGINEERED SYSTEMS INVOLVING COMPUTATIONALLY EXPENSIVE BLACK-BOX SIMULATIONS
Technical Paper Publication. DETC2017-68273

Mohammadkazem Sadoughi, Meng Li, Chao Hu, Cameron A. MacKenzie, *Iowa State University, Ames, IA, USA*

A MEAN VALUE RELIABILITY METHOD FOR BIMODAL DISTRIBUTIONS
Technical Paper Publication. DETC2017-67279

Zhangli Hu, Xiaoping Du, *Missouri University of Science and Technology, Rolla, MO, USA*

DEC-5-2: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 23 **9:10AM–10:50AM**

Session Organizer: **Zahra Shahbazi,** *Manhattan College, Stamford, CT, USA*

OVERVIEW OF UNDERGRADUATE STEM EDUCATION RESEARCH AND RELATED NSF FUNDING OPPORTUNITIES

Karen E. Crosby, *Southern University Baton Rouge, Louisiana, USA*

DFMLC-4-1: DESIGN FOR MANUFACTURING AND ASSEMBLY

EXHIBIT HALL LEVEL, ROOM 22 **9:10AM–10:50AM**

Session Organizer: **Janet Allen,** *University of Oklahoma, Oklahoma, OK, USA*

Session Co-Organizer: **Chiradeep Sen,** *Florida Institute of Technology, Florida, FL, USA*

VARIATION ANALYSIS FOR WORKPIECE-FIXTURE ASSEMBLY WITH QUASI-MONTE CARLO SIMULATION
Technical Paper Publication. DETC2017-67326

Wenbin Tang, Xueliang Huang, Nan Zhang, Lei Wang, *Institute of Systems Engineering, CAEP, Mianyang, China*

A METHOD TO DETERMINE THE OPTIMAL CHECKING-FIXTURE LAYOUT FOR GAUGE REPEATABILITY
Technical Paper Publication. DETC2017-67474

Christopher Slon, *FCA US, Auburn Hills, MI, USA,* ***Vijitashwa Pandey,*** *Oakland University, Oakland, CA, USA*

A CONCURRENT DESIGN EXPLORATION METHOD FOR REALIZING NETWORKED MANUFACTURING SYSTEMS
Technical Paper Publication. DETC2017-67557

Jelena Milisavljevic, *University of Oklahoma, Norman, OK, USA,* ***Sesh Commuri,*** *University of Nevada, Reno, Reno, NV, USA,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

AN EMPIRICAL DESIGN TOOL FOR ESTIMATING IN-PLANE DIAMETRIC SHRINKAGE AND BULGING OF CIRCULAR CYLINDERS MADE WITH FUSED-DEPOSITION MODELING
Technical Paper Publication. DETC2017-68039

Kirill Martusevich, *Florida Institute of Technology, West Melbourne, FL, USA,* ***Chiradeep Sen,*** *Florida Institute of Technology, Florida, FL, USA*

EVALUATING ASSEMBLY DESIGN EFFICIENCY: A COMPARISON BETWEEN LUCAS AND BOOTHROYD-DEWHURST METHODS
Technical Paper Publication. DETC2017-68126

Surya Venkata Sumanth Dochibhatla, Manas Bhattacharya, *Florida Institute of Technology, Melbourne, FL, USA,* ***Beshoy Morkos,*** *Florida Institute of Technology, Florida, FL, USA*

DFMLC-14-1: STUDENT POSTER COMPETITION ON DATA-DRIVEN X FOR THE LIFE CYCLE

EXHIBIT HALL LEVEL, ROOM 21 **9:10AM–10:50AM**

Session Organizer: **William Bernstein,** *National Institute of Standards and Technology, Gaithersburg, MD, USA*

Session Co-Organizer: **Michael Sharp,** *National Institute of Standards and Technology, Gaithersburg, MD, USA*

A RAPID AUTOMATIC LIFE CYCLE ASSESSMENT TOOL FOR ECO-DESIGN

Poster Paper Publication. DETC2017-67617

Yongxian Zhu, *Purdue University West Lafayette, West Lafayette, IN, USA,* ***Fu Zhao****, Purdue University, West Lafayette, IN, USA*

MANUFACTURING ENERGY CONSUMPTION ESTIMATION USING MACHINE LEARNING APPROACH

Student Competition Paper. DETC2017-67679

Ruoyu Song, Yanglong Lu, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Cassandra Telenko,*** *Georgia Institute of Technology, Georgia, GA, USA,* ***Yan Wang,*** *Georgia Institute of Technology, Atlanta, GA, USA*

ENABLING CYBER-BASED LEARNING OF PRODUCT SUSTAINABILITY ASSESSMENT USING UNIT MANUFACTURING PRO-CESS ANALYSIS

Poster Paper Publication. DETC2017-68249

Kamyar Raoufi, *Oregon State University, Corvallis, OR, USA,* ***Karl Haapala,*** *Oregon State University, Oregon, OR, USA,* ***Gul Kremer,*** *Iowa State University, Iowa, IA, USA,* ***Kyoung-Yun Kim, Carolyn Psenka,*** *Wayne State University, Detroit, MI, USA,* ***Kathy Jackson,*** *Pennsylvania State University, State College, PA, USA*

COMPARING THE SUSTAINABILITY PERFORMANCE OF METAL-BASED ADDITIVE MANUFACTURING PROCESSES

Poster Paper Publication. DETC2017-68262

Rothanak Chan, *Oregon State University, Corvallis, OR, USA,* ***Sriram Manoharan,*** *Oregon State University, Corvallis, OR, USA,* ***Karl Haapala,*** *Oregon State University, Oregon, OR, USA*

DTM-10-1: PROTOTYPING AND DESIGN REPRESENTATION

EXHIBIT HALL LEVEL, ROOM 20 **9:10AM–10:50AM**

Session Organizer: **Jesse Austin-Breneman,** *University of Michigan, Ann Arbor, Ann Arbor, MI, USA*

Session Co-Organizer: **Timothy Simpson,** *Pennsylvania State University, University Park, PA, USA*

WHAT IS A PROTOTYPE?: EMERGENT ROLES OF PROTOTYPES FROM EMPIRICAL WORK IN THREE DIVERSE COMPANIES

Technical Paper Publication. DETC2017-67173

Carlye Lauff, *University of Colorado at Boulder, Boulder, CO, USA,* ***Daria Kotys-Schwartz,*** *University of Colorado at Boulder, Lakewood, CO, USA,* ***Mark Rentschler,*** *University of Colorado at Boulder, Boulder, CO, USA*

EVALUATING THE DISCRIMINATORY VALUE AND RELIABILITY OF IDEATION METRICS FOR THEIR APPLICATION TO CONCEPT DEVELOPMENT AND PROTOTYPING

Technical Paper Publication. DETC2017-67816

Jessica Menold, *Pennsylvania State University, University Park, PA, USA,* ***Kathryn Jablokow,*** *Penn State University, Malvern, PA, USA,* ***Timothy Simpson, Rafael Seuro,*** *Pennsylvania State University, University Park, PA, USA*

PROTOTYPING METHODS FOR SMALL-TO-MEDIUM MANUFACTURING ENTERPRISES IN RESOURCE-CONSTRAINED SETTINGS: A CASE STUDY

Technical Paper Publication. DETC2017-68281

Suzanne Chou, Jesse Austin-Breneman, *University of Michigan, Ann Arbor, Ann Arbor, MI, USA*

HOW IT IS MADE MATTERS: DISTINGUISHING TRAITS OF DESIGNS CREATED BY SKETCHES, PROTOTYPES, AND CAD

Technical Paper Publication. DETC2017-68403

Geoff Tsai, Maria Yang, *MIT, Cambridge, MA, USA*

MEASURING INFORMATION CONTENT OF FREEHAND SKETCHES USING A COGNITIVE CHUNK VISUALIZATION PROTOCOL

Technical Paper Publication. DETC2017-68077

Chiradeep Sen, *Florida Institute of Technology, Florida, FL, USA,* ***Quintcey Parrish,*** *Florida Institute of Technology, Melbourne, FL, USA,* ***Omar Galil,*** *FL Institute of Tech, Melbourne, FL, USA*

MR-4-6: MECHANISMS

EXHIBIT HALL LEVEL, ROOM 9 **9:10AM–10:50AM**

Session Organizer: **James Joo,** *Air Force Research Laboratory, WPAFB, OH, USA*

Session Co-Organizer: **Brian Trease,** *The University of Toledo, Toledo, OH, USA*

GEOMETRY OF MODULAR ORIGAMI METAMATERIALS

Technical Paper Publication. DETC2017-67547

Yunfang Yang, Zhong You, *University of Oxford, Oxford, Oxfordshire, United Kingdom*

POLYHEDRA FABRICATION THROUGH MESH CONVEXIFICATION: A STUDY OF FOLDABILITY OF NEARLY CONVEX SHAPES

Technical Paper Publication. DETC2017-67212

Zhonghua Xi, Jyh-Ming Lien, *George Mason University, Fairfax, VA, USA*

ANISOTROPIC, ADAPTIVE, AND ASYMMETRIC MULTI-STABILITY FROM ORIGAMI FOLDING

Technical Paper Publication. DETC2017-67285

Suyi Li, *Clemson University, Clemson, SC, USA*

DESIGN OF A BISTABLE ORIGAMI REVERSE-FOLD USING SPHERICAL KINEMATICS

Technical Paper Publication. DETC2017-67867

Rami Alfattani*, University of South Florida, Tampa, FL, USA,* ***Craig Lusk,*** *The University of South Florida, Lutz, FL, USA*

KINEMATICS AND DISCRETIZATION OF CURVED-FOLD MECHANISMS
Technical Paper Publication. DETC2017-67439

Robert Lang, *Robert J. Lang Origami, Alamo, CA, USA,* ***Todd Nelson, Spencer P. Magleby,*** *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

MR-7-2: ASSISTIVE DEVICES

EXHIBIT HALL LEVEL, ROOM 10 **9:10AM–10:50AM**

Session Organizer: **Thomas Sugar,** *Arizona State University, Tempe, AZ, USA*

Session Co-Organizer: **Guimin Chen,** *Xidian University, Xi'an, UT, USA*

DESIGN OF WEARABLE LOWER LEG ORTHOTIC BASED ON SIX-BAR LINKAGE
Technical Paper Publication. DETC2017-67837

Shramana Ghosh, *UCI, Irvine, CA, USA,* ***Nina Robson,*** *California State University, Fullerton, Fullerton, CA, USA,* ***J. Michael McCarthy,*** *University of California, Irvine, Irvine, CA, USA*

DESIGN AND PRELIMINARY EVALUATION OF A POWERED PEDIATRIC LOWER LIMB ORTHOSIS
Technical Paper Publication. DETC2017-67599

Curt Laubscher, *Cleveland State University, Cleveland, OH, USA,* ***Ryan Farris,*** *Parker Hanafin, Cleveland, OH, USA,* ***Jerzy Sawicki,*** *Cleveland State University, Cleveland, OH, USA*

VARIABLE POSITION AND FORCE CONTROL OF A PNEUMATICALLY ACTUATED KNEE JOINT
Technical Paper Publication. DETC2017-67394

Jeremy Krause, *The University of Texas at San Antonio, Castroville, TX, USA,* ***Pranav Bhounsule,*** *University of Texas at San Antonio, San Antonio, TX, USA*

A NOVEL SIX-BAR MECHANISM FOR EXECUTING MOTION TRAJECTORIES OF SIT-TO-STAND TRANSFORMATION IN A MULTIFUNCTIONAL MOBILITY ASSIST DEVICE
Technical Paper Publication. DETC2017-67470

Anurag Purwar, Akshay Jadhav, *Stony Brook University, Stony Brook, NY, USA*

DESIGN AND INTEGRATION OF A TWO-DIGIT EXOSKELETON GLOVE
Technical Paper Publication. DETC2017-67373

Eric Refour, Bijo Sebastian, Pinhas Ben-Tzvi, *Virginia Tech, Blacksburg, VA, USA*

MR-8-6: SERIAL AND PARALLEL MECHANISMS

EXHIBIT HALL LEVEL, ROOM 11 **9:10AM–10:50AM**

Session Organizer: **Gregory S. Chirikjian,** *Johns Hopkins University, Baltimore, MD, USA*

Session Co-Organizer: **Jonathan Hopkins,** *University of California, Los Angeles, Los Angeles, CA, USA*

OPTIMIZATION OF THE SINGULARITY LOCUS OF A NOVEL KINEMATICALLY REDUNDANT SPHERICAL PARALLEL MANIPULATOR
Technical Paper Publication. DETC2017-67840

Jérôme Landuré, *Université Laval, Québec, QC, Canada,* ***Clement Gosselin,*** *Laval University, Quebec, QC, Canada*

BIPED 4-UPU PARALLEL MECHANISM
Technical Paper Publication. DETC2017-67349

Zhihuai Miao, *Shenzhen Graduate School, Harbin Institute of Technology, Shenzhen, Guangdong, China,* ***Yanan Yao,*** *Beijing Jiaotong University, Beijing, China,* ***Xianwen Kong,*** *Heriot-watt University, Edinburgh, Scotland,* ***Bing Li,*** *Shenzhen Graduate School, Harbin Institute of Technology, Shenzhen, China*

RECONFIGURABLE 3-PRS PARALLEL SOLAR TRACKING STAND
Student Competition Paper. DETC2017-67275

Zhongxing Yang, Dan Zhang, *York University, Toronto, ON, Canada*

A QUALITATIVE SURVEY OF RECONFIGURABLE MECHANISMS WITH INDUSTRIAL APPLICATIONS
Technical Paper Publication. DETC2017-67193

Anthony Buchta, Philip Voglewede, *Marquette University, Milwaukee, WI, USA*

REPORT OF ROBOTIC MACHINING MEASUREMENTS USING A STAUBLI TX200 ROBOT: APPLICATION TO MILLING
Technical Paper Publication. DETC2017-67364

Hoai Nam Huynh, Edouard Rivière-Lorphèvre, Olivier Verlinden, *University of Mons, Mons, Hainaut, Belgium*

MNS-8-2: ADVANCED MEASUREMENTS AND CONTROL OF AFM DYNAMICS

EXHIBIT HALL LEVEL, ROOM 13 **9:10AM–10:50AM**

Session Organizer: **Hanna Cho,** *The Ohio State University, Columbus, OH, USA*

DYNAMICS OF MULTIFREQUENCY ATOMIC FORCE MICROSCOPY
Technical Presentation. DETC2017-67455

Santiago Solares, *The George Washington University, Washington, DC, USA*

ON AN OPTIMAL CONTROL APPLIED IN ATOMIC FORCE MICROSCOPY (AFM) INCLUDING FRACTIONAL-ORDER

Technical Paper Publication. DETC2017-67536

Angelo M. Tusset, *Federal University of Technology – Parana, Ponta Grossa, Parana, Brazil,* ***Jose Manoel Balthazar,*** *Aeronautics Technological Institute, São José dos Campos, Brazil,* ***Jeferson Jose de Lima,*** *Sao Paulo State University, Sao Paulo, Brazil,* ***Rodrigo Tumolin Rocha, Frederic Conrad Janzen,*** *Federal University of Technology – Parana, Ponta Grossa, Parana, Brazil,* ***Patricia Sayuri Yamaguchi,*** *Sao Paulo State University, Bauru, Sao Paulo, Brazil*

ENHANCED NONLINEAR INTERNAL RESONANCE IN THE DESIGN OF A NEW CANTILEVER FOR AFM

Technical Presentation. DETC2017-68514

Randi Potekin, *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Sajith Dharmasena,*** *Ohio State University, Columbus, OH, USA,* ***Seok Kim,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Lawrence Bergman,*** *University of Illinois/Urbana, Urbana, IL, USA,* ***Alexander Vakakis,*** *University of Illinois, Urbana, IL, USA,* ***Hanna Cho,*** *The Ohio State University, Columbus, OH, USA*

MESA-10-1: MECHATRONICS AND EMBEDDED SYSTEMS APPLICATIONS (MESA)

EXHIBIT HALL LEVEL, ROOM 14 **9:10AM–10:50AM**

Session Organizer: **Adriano Mancini,** *Universit Politecnica Delle Marche, Ancona, Italy*

Session Co-Organizer: **Primo Zingaretti,** *Università Politecnica delle Marche, Ancona, Italy*

TANGIBLE AUGMENTED REALITY MODEL TO SUPPORT MANUAL ASSEMBLY

Technical Paper Publication. DETC2017-67742

Marco Matteucci, *Università Politecnica delle Marche, Porto Recanati, Mc, Italy,* ***Damiano Raponi, Maura Mengoni,*** *Polytechnic University of Marche, Ancona, Italy,* ***Margherita Peruzzini,*** *University of Modena and Reggio Emilia, Modena, Italy*

ADDING CHANNEL SECURITY TO A FINGERPRINT VERIFICATION CHAIN

Technical Paper Publication. DETC2017-67356

Matthias Wenzl, Daniel Kluka, *UAS Technikum Wien, Vienna, Austria*

AN ATTENTION-BASED FRAMEWORK FOR CONTEXT IDENTIFICATION IN AUTONOMOUS ROBOTS

Technical Paper Publication. DETC2017-68184

Maria Alessandra Montironi, Harry H. Cheng, *University of California, Davis, Davis, CA, USA*

REFRESHABLE BRAILLE DISPLAY USING SHAPE MEMORY ALLOY WITH LATCH MECHANISM

Technical Paper Publication. DETC2017-68311

Pulkit Sapra, Ankit Kumar Parsurampuria, Suman Muralikrishnan, Varan Gupta, M. Balakrishnan, P. V. M. Rao, *Indian Institute of Technology Delhi, New Delhi, India,* ***H. Karthikeyan, K. Bhagavatheesh, Arun Venkatesan, Sashikumar Valiyaveetil,*** *Phoenix Medical Systems Pvt Ltd, Chennai, Tamil Nadu, India,*

C-STEM STUDIO: A SOLUTION FOR LEARNING COMPUTING AND STEM TOPICS WITH ROBOTICS AND EMBEDDED SYSTEMS

Technical Paper Publication. DETC2017-68362

Binsen Qian, *University of California at Davis, Davis, CA, USA,* ***Harry H. Cheng,*** *University of California, Davis, Davis, CA, USA*

MESA-21-1: MICRO-/NANO-MANIPULATION TECHNOLOGIES AND APPLICATIONS (MNMTA) I

EXHIBIT HALL LEVEL, ROOM 19 **9:10AM–10:50AM**

Session Organizer: **Peng Yan,** *Shandong University, Jinan, China*

Session Co-Organizer: **Zhen Zhang,** *Tsinghua University, Beijing, China*

DESIGN OF A MFC FORCE SENSOR FOR ROBOT-ASSISTED BIOLOGICAL CELL MICROINJECTION

Technical Paper Publication. DETC2017-67243

Yuzhang Wei, Qingsong Xu, *University of Macau, Macau, Macau*

DISTURBANCE OBSERVER-BASED SLIDING MODE CONTROL OF A PIEZOELECTRIC NANO-MANIPULATOR

Technical Paper Publication. DETC2017-67621

Yangming Zhang, *Beihang University, Beijing, China,* ***Peng Yan,*** *Shandong University, Jinan, China*

A PHASE CONTROL APPROACH TO PIEZOELECTRIC ACTUATED NANOPOSITIONING SYSTEMS

Technical Paper Publication. DETC2017-67673

Zhou Jiang, *Xi'an Jiaotong University, Xi'an, China,* ***Junyi Cao, Mingxiang Ling,*** *Xi'an Jiaotong University, Xian, China*

AN XY NANOPOSITIONER WITH A SELF-ADJUSTING STIFFNESS CENTER MODULE

Technical Paper Publication. DETC2017-68043

Zhiqing Liu, Zhen Zhang*, Tsinghua University, Beijing, China*

MSNDC-5-3: NONLINEAR DYNAMICS OF STRUCTURES III

BALLROOM LEVEL, ROOM 25B **9:10AM–10:50AM**

Session Organizer: **Laura Ruzziconi,** *Universita Politecnica delle Marche, Ancona, Italy*

Session Co-Organizer: **Enrico Babilio,** *Universita degli Studi di Napoli Federico II, Napoli, Italy*

A SIMPLE COMPUTATIONAL TOOL FOR STUDYING ACOUSTIC WAVES IN NONLINEAR MEDIUM
Technical Paper Publication. DETC2017-67892

Nirmal Jayaprasad Nair, *University of Illinois Urbana Champaign, Urbana, IL, USA,* ***Utsav Shah,*** *Airbus, Ahmedabad, India*

STEADY-STATE ANALYSIS OF A 2-DOF 2-SIDE SELF-IMPACTING OSCILLATOR
Technical Presentation. DETC2017-68501

Hongcheng Tao, James Gibert, *Purdue University, West Lafayette, IN, USA*

DYNAMIC ANALYSIS OF AN ELEVATOR TRAVELING CABLE USING A SINGULARITY-FREE BEAM FORMULATION
Student Competition Paper. DETC2017-68299

Wei Fan, *Harbin Institute of Technology, Harbin, China,* ***Weidong Zhu,*** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

ROOT FINDING USING DYNAMIC RELAXATION WITH APPLICATIONS IN STABILITY AND STRUCTURAL DYNAMICS
Technical Presentation. DETC2017-67462

Richard Wiebe, *University of Washington, Seattle, WA, USA*

AMPLITUDE DEATH INDUCED BY MECHANICAL COUPLING
Technical Paper Publication. DETC2017-67499

Yimin Wei, Zhi-Ke Peng, Xing-Jian Dong, Wen-Ming Zhang, *Shanghai Jiao Tong University, Shanghai, China,* ***Guang Meng,*** *Shanghai Jiao Tong University, Shanghai 200030, China*

MSNDC-11-2: IMPROVED CONTROL METHODS FOR NONLINEAR SYSTEMS

BALLROOM LEVEL, ROOM 25A **9:10AM–10:50AM**

Session Organizer: **Elizbieta Jarzebowska,** *Warsaw University of Technology, Warsaw, Poland*

Session Co-Organizer: **Dirk Soeffker,** *Universitaet Duisburg-Essen, Duisburg, Germany*

MODEL-FREE CONTROL APPROACH OF A THREE-TANK SYSTEM USING AN ADAPTIVE-BASED CONTROL
Technical Paper Publication. DETC2017-67487

Elmira Madadi, Yao Dong, *University of Duisburg-Essen, Duisburg, Germany,* ***Dirk Söffker,*** *Duisburg-Essen University, Duisburg, Germany*

EMERGENT BEHAVIOR CHARACTERIZATION OF AN ANT-INSPIRED, MULTIPLE-PHEROMONE-DRIVEN ROBOT SWARM
Technical Paper Publication. DETC2017-67951

Adam Schroeder, Marwan H. Mohamed, *University of Toledo, Toledo, OH, USA,* ***Brian Trease,*** *The University of Toledo, Toledo, OH, USA*

A LYAPUNOV PROOF OF STABILITY FOR PARALLEL CONTROLLERS OF SISO SYSTEMS
Technical Paper Publication. DETC2017-68036

Andy Zelenak, Meredith Pitsch, Benito Fernandez, Mitch Pryor, *The University of Texas at Austin, Austin, TX, USA*

ANALYSIS OF SLIDING MODE OBSERVERS USING A NOVEL TIME-AVERAGED LYAPUNOV FUNCTION
Technical Paper Publication. DETC2017-68131

Sagar Mehta, Krishna Vijayaraghavan, *Simon Fraser University, Surrey, BC, Canada*

DESIGN OF OPTIMAL FRACTIONAL LUENBERGER OBSERVERS FOR LINEAR FRACTIONAL-ORDER SYSTEMS
Student Competition Paper. DETC2017-68328

Arman Dabiri, Eric Butcher, *University of Arizona, Tucson, AZ, USA*

MSNDC-13-1: COMPUTATIONAL METHODS I

BALLROOM LEVEL, ROOM 26C **9:10AM–10:50AM**

Session Organizer: **Olivier Bauchau,** *University of Maryland, College Park, Maryland 20742, MD, USA*

Session Co-Organizer: **Zdravko Terze,** *University of Zagreb, Zagreb, Croatia (Hrvatska)*

THIRD-ORDER DIFFERENTIAL-ALGEBRAIC EQUATIONS FOR IMPROVED INTEGRATION OF MULTIBODY DYNAMICS
Technical Paper Publication. DETC2017-67448

H. J. Sommer, *The Pennsylvania State University, University Park, PA, USA*

SELECTIVE GENERALIZED COORDINATES PARTITIONING METHOD FOR MULTIBODY SYSTEMS WITH NON-HOLONOMIC CONSTRAINTS
Technical Paper Publication. DETC2017-67476

Ayman A. Nada, Abdullateef H. Bashiri, *Jazan University, Jazan, Saudi Arabia*

NUMERICAL INVESTIGATION ON THE ONSET OF FRICTIONAL SLIDING
Technical Presentation. DETC2017-67648

Xisheng Li, Caishan Liu, *Peking University, Beijing, China*

NULL SPACE METHOD OF DIFFERENTIAL EQUATION TYPE FOR MOTION ANALYSIS OF MULTIBODY SYSTEMS
Technical Paper Publication. DETC2017-67781

Keisuke Kamiya, Yusaku Yamashita, *Aichi Institute of Technology, Toyota, Japan*

QUADROTOR FORWARD DYNAMICS WITH QUATERNION ATTITUDE RECONSTRUCTION BASED ON NON-REDUNDANT ODE SYSTEM
Technical Presentation. DETC2017-68511

Zdravko Terze, *University of Zagreb, Zagreb, Croatia (Hrvatska),* ***Dario*** *Zlatar,* ***Viktor Panda,*** *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia (Hrvatska)*

PTG-2-1: GEAR ANALYSIS, MATERIALS, FATIGUE (1)

EXHIBIT HALL LEVEL, ROOM 16 **9:10AM–10:50AM**

Session Organizer: **Datong Qin,** *Chongqing University, Chongqing, China*

Session Co-Organizer: **Ahmet Kahraman,** *Ohio State University, Columbus, OH, USA*

A NUMERICAL APPROACH TO THE CALCULATION OF THE SURFACE TEMPERATURE DISTRIBUTION OF WORM GEARS
Technical Paper Publication. DETC2017-67049

Philipp Roth, Werner Sigmund, Sebastian Born, Daniel Kadach, Karsten Stahl, *Technical University of Munich, Germany*

THE EFFECT OF SPUR GEAR TRIBO-DYNAMIC RESPONSES ON PITTING CRACK NUCLEATION
Technical Paper Publication. DETC2017-67003

Sheng Li, Anusha Anisetti, *Wright State University, Dayton, OH, USA*

HYPOID GEAR DESIGN BEYOND CONVENTIONAL APPROACH
Technical Paper Publication. DETC2017-67080

J. C. Wang, Scott Kuan, W. Yukio Hirao, *Meritor Inc., Troy, MI, USA*

MEASUREMENT AND CONTROL SOFTWARE FOR TRANSMISSION ERROR OF BEVEL GEAR PAIR
Technical Paper Publication. DETC2017-67176

Jie Tang, Binghe Wang, Zhaoyao Shi, *Beijing University of Technology, Beijing, China*

A CALCULATION METHOD OF MESHING STIFFNESS FOR HERRINGBONE GEARS BASED ON FEM
Technical Paper Publication. DETC2017-67181

Jing Xu, Changjiang Zhou, *Hunan University, Changsha, China*

PTG-3-4: GEAR DYNAMICS AND NOISE (4)

EXHIBIT HALL LEVEL, ROOM 15 **9:10AM–10:50AM**

Session Organizer: **Robert Handschuh,** *NASA Glenn Research Center, Cleveland, OH, USA*

Session Co-Organizer: **Qian Tang,** *Chongqing University, Chongqing, China*

OPTIMAL RIB LAYOUT DESIGN OF GEARBOX FOR THE REDUCTION OF RADIATED NOISE
Technical Paper Publication. DETC2017-67054

Geng Liu, *Northwestern Polytechnical University, Xi'an, Shannxi, China,* ***Jinpeng Wang, Shan Chang,*** *Northwestern Polytechnical University, Xi'an, China*

ANALYSIS OF THE HOUSING VIBRATION OF A ROTORCRAFT PLANETARY GEAR USING A FINITE ELEMENT/CONTACT MECHANICS MODEL
Technical Paper Publication. DETC2017-67984

Christopher G. Cooley, *Southern Illinois University Carbondale, Carbondale, IL, USA,* ***Adrian Hood,*** *US Army Research Laboratory, Adelphi, MD, USA*

DYNAMIC TRANSMISSION ACCURACY ANALYSIS OF AN RV REDUCER RIGID-FLEXIBLE COUPLED EFFECT
Technical Paper Publication. DETC2017-67063

Daijia Cao, Caichao Zhu, Xuesong Du, Huaiju Liu, Peilin Guo, *Chongqing University, Chongqing, China*

DYNAMIC MODELLING OF SPLIT-TORQUE FACE-GEAR DRIVE SYSTEMS
Technical Presentation. DETC2017-68498

Mustafa Ozgur Aydogan, Zihni Saribay, *Turkish Aerospace Industries, Ankara, Turkey,* ***H. Nevzat Ozguven,*** *Middle East Technical University, Ankara 06510, Turkey*

VIB-3-4: ENERGY HARVESTING II

[Cross-listed with MSNDC-2]

BALLROOM LEVEL, ROOM 26B **9:10AM–10:50AM**

Session Organizer: **Alper Erturk,** *Georgia Institute of Technology, Atlanta, GA, USA*

Session Co-Organizer: **Ryan L Harne,** *The Ohio State University, Columbus, OH, USA*

THE ACCURATE ANALYSIS OF MAGNETIC FORCE OF BI-STABLE PIEZOELECTRIC CANTILEVER ENERGY HARVESTER
Technical Paper Publication. DETC2017-67168

YuYang Zhang, Yong Gang Leng, Shengbo Fan, *Tianjin University, Tianjin, China*

A BROADBAND ENERGY HARVESTER WITH INTERNAL RESONANCE INDUCED BY TWO RESONATORS
Technical Paper Publication. DETC2017-67442

Shahrzad Towfighian, *Binghamton University, Binghamton, NY, USA,* ***Wei Yang,*** *State University of New York at Binghamton, Binghamton, NY, USA*

MODELING ANIMPACT VIBRATION HARVESTER WITH TRIBOELECTRIC TRANSDUCTION
Technical Paper Publication. DETC2017-68283

Alwathiqbellah Ibrahim, *Binghamton University, Binghamton, NY, USA,* ***Abdallah Ramini,*** *Gannon University, Erie, PA, USA,* ***Shahrzad Towfighian,*** *Binghamton University, Binghamton, NY, USA*

TOWARDS OPTIMIZING DC LOADS FOR POWER GENERATION FROM ARBITRARILY EXCITED NONLINEAR VIBRATION ENERGY HARVESTERS
Technical Paper Publication. DETC2017-67550

Quanqi Dai, Ryan L Harne, *The Ohio State University, Columbus, OH, USA*

VIB-6-2: STIFFNESS AND DAMPING OF JOINTED STRUCTURES

[Cross-listed with MSNDC-4]

BALLROOM LEVEL, ROOM 25C **9:10AM–10:50AM**

Session Organizer: **Matthew Brake,** *William Marsh Rice University, Houston, TX, USA*

METHODS FOR THE MEASUREMENT OF NON-LINEAR DAMPING AND FREQUENCY IN BUILT-UP STRUCTURES
Technical Paper Publication. DETC2017-67007

Hugh Goyder, Damien P. T. Lancereau, *Cranfield University, Swindon, United Kingdom*

SOME DYNAMIC PROPERTIES OF CONTACT PATCHES IN BOLTED JOINTS
Technical Paper Publication. DETC2017-67008

Damien P. T. Lancereau, Hugh Goyder, *Cranfield University, Swindon, United Kingdom,* ***Philip Ind, Daniel Brown,*** *AWE, Reading, United Kingdom*

A METHOD FOR SLIP-STICK AREA ANALYSIS OF CONTACT SURFACE IN ROTOR BLADES WITH FRICTION DAMPER
Technical Paper Publication. DETC2017-67524

Mao Xinnan, Wang Yanrong, Ye Hang, *Beihang University, Beijing, China*

FINDING THE STIFFNESSES OF INTERFACE CONTACT ELEMENTS FOR THE COMPUTATIONAL MODEL OF STEAM TURBINE BLADING
Technical Paper Publication. DETC2017-67712

Josef Voldrich, Jan Lazar, *University of West Bohemia, Plzen, Czech Republic,* ***Pavel Polach,*** *Research and Testing Institute Plzen, Plzen, Czech Republic,* ***Stefan Morávka,*** *University of West Bohemia, Plzen, Czech Republic*

VIBRATION AMPLITUDE AND FASTENER TORQUE DEPENDENCE OF DAMPING IN A JOINTED STRUCTURE
Student Competition Paper. DETC2017-68069

Trevor Jerome, *Applied Research Laboratory, State College, PA, USA,* ***Stephen A. Hambric, Micah R. Shepherd,*** *Applied Research Lab / Penn State, State College, PA, USA*

VIB-10-2: ACE: ANALYTICAL, COMPUTATIONAL, AND EXPERIMENTAL SYNNERGY

[Cross-listed with MSNDC-10]

BALLROOM LEVEL, ROOM 26A **9:10AM–10:50AM**

Session Organizer: **Bruce Geist,** *Fiat Chrysler Automobiles, Auburn Hills, MI, USA*

HALF-PLANE CONTACT ANALYSIS USING TRIGNOMETRIC POLYNOMIALS
Technical Presentation. DETC2017-68472

Daniel Segalman, Gaurav Chauda, *Michigan State University, East Lansing, MI, USA*

PERFORMANCE ASSESSMENT OF GEAR CONDITION INDICATORS IN DETECTING PROGRESSIVE GEAR TOOTH CRACK
Technical Paper Publication. DETC2017-67460

Yang Luo, Natalie Baddour, Ming Liang, *University of Ottawa, Ottawa, ON, Canada*

SANDIA FRACTURE CHALLENGE AND THE STRUCTURAL RELIABILITY PARTNERSHIP: MOVING FROM COOPERATIVE ASSESSMENT TO COLLABORATIVE RESEARCH TO ADVANCE FAILURE MODELING
Invited Presentation.

Jim Redmond, *Sandia National Laboratories, Albuquerque, NM, USA*

STABILITY AND BIFURCATION OF LONGITUDINAL VEHICLE TRACTION
Invited Presentation.

Brian Olson, *The Johns Hopkins University Applied Physics Lab, Laurel, MD, USA,* ***Steven W. Shaw,*** *Florida Institute of Technology, Melbourne, FL, USA, and* ***Gabor Stepan,*** *Budapest University of Tech and Eco, Budapest, Hungary*

CIE-6-2: AMS/SEIKM/CAPPD: DESIGN, SIMULATION AND OPTIMIZATION FOR ADDITIVE MANUFACTURING II

CONCOURSE LEVEL, ROOM 4 **11:00AM–12:00PM**

Session Organizer: **Douglas Eddy,** *University of Massachusetts Amherst, Amherst, MA, USA*

FUNCTIONAL PERFORMANCE TAILORING OF ADDITIVELY MANUFACTURED COMPONENTS VIA TOPOLOGY OPTIMIZATION
Technical Paper Publication. DETC2017-67600

John Steuben, *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA,* ***Athanasios Iliopoulos, Andrew J. Birnbaum,*** *US Naval Research Laboratory, Washington, DC, USA*

EFFECT OF IMPLICITLY DERIVED INFILL PATTERNS ON MECHANICAL PROPERTIES
Technical Paper Publication. DETC2017-67572

Davis Adams, *Clemson University, Marietta, GA, USA,* ***Cameron Turner,*** *Clemson University, Clemson, SC, USA*

TOWARDS MULTISCALE TOPOLOGY OPTIMIZATION FOR ADDITIVELY MANUFACTURED COMPONENTS USING IMPLICIT SLICING
Technical Paper Publication. DETC2017-67596

John Steuben, *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***Athanasios Iliopoulos,*** *US Naval Research Laboratory, Washington, DC, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA*

CIE-20-1: SEIKM PANEL: SMART AND CONNECTED VEHICLES–COMING SOON TO A PLACE NEAR YOU!

CONCOURSE LEVEL, ROOM 5 **11:00AM–12:00PM**

Session Organizer: **Ashis Banerjee,** *University of Washington, Seattle, WA, USA*

Session Co-Organizer: **Pramita Mitra,** *Ford Motor Company, Detroit, MI, USA*

Panelists Details Not Available at Press Time

CIE-24-1: ADVANCEMENT IN DIGITAL TECHNOLOGY SYSTEMS, USAGE OF VR AND TOOLS FOR DESIGN ENGINEERING

CONCOURSE LEVEL, ROOM 3 **11:00AM–12:00PM**

Session Organizer: **Robert Wendrich,** *N/A, Twente, Holland Netherlands*

Session Co-Organizers: **Pramita Mitra,** *Ford Motor Company, Bloomfield Township, MI, USA,* **Theo Lim,** *Heriot-watt University, Edinburgh, Scotland,* **Jannicke Baalsrud Hauge,** *Royal Institute of Technology, Södertälje, Sweden*

HOW VR IS CHANGING THE FACE OF AUTOMOTIVE USER EXPERIENCE
Panel. DETC2017-68595

Pramita Mitra, *Ford Motor Company, Bloomfield Township, MI, USA*

HOW VR IS CHANGING THE FACE OF ENGINEERING PROCESSES THROUGH INTEGRATION AND COLLABORATION
Panel. DETC2017-68596

Jannicke Baalsrud Hauge, *Royal Institute of Technology, Södertälje, Sweden*

CHALLENGES FOR VR IN THE CONTEXT OF INDUSTRIAL DESIGN, ENGINEERING AND MANUFACTURING
Panel. DETC2017-68597

Theo Lim, *Heriot-watt University, Edinburgh, Scotland*

CHALLENGES OF REAL AND VR WORLDS IN THE CONTEXT OF INDUSTRIAL DESIGN, ENGINEERING AND MANUFACTURING
Panel. DETC2017-68598

Robert Wendrich, *N/A, Twente, Holland Netherlands*

DAC-5-1: DESIGN AND OPTIMIZATION OF SUSTAINABLE ENERGY SYSTEMS 1

CONCOURSE LEVEL, ROOM 7 **11:00AM–12:00PM**

Session Organizer: **Souma Chowdhury,** *University at Buffalo, Buffalo, NY, USA*

Session Co-Organizer: **Bryony DuPont,** *Oregon State University, Oregon, OR, USA*

A DESIGN METHODOLOGY FOR A FLEXIBLE WIND TURBINE BLADE WITH AN ACTIVELY VARIABLE TWIST DISTRIBUTION TO INCREASE REGION 2 EFFICIENCY
Technical Paper Publication. DETC2017-68302

Hamid Khakpour Nejadkhaki, John Hall, *University at Buffalo, Buffalo, NY, USA*

A GUIDED PARTICLE SWARM OPTIMIZER FOR DISTRIBUTED OPERATION OF ELECTRIC VEHICLE TO BUILDING INTEGRATION
Technical Paper Publication. DETC2017-67530

Yang Chen, Mengqi Hu, *University of Illinois at Chicago, Chicago, IL, USA*

UNRESTRICTED WIND FARM LAYOUT DESIGN WITH OPTIMAL CONTROL CONSIDERATIONS
Technical Paper Publication. DETC2017-67480

Anand Deshmukh, *University of Illinois at Urbana Champaign, Urbana, IL, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

DAC-11-2: DESIGN OF ENGINEERING MATERIALS AND STRUCTURES 2

CONCOURSE LEVEL, ROOM 8 **11:00AM–12:00PM**

Session Organizer: **Andres Tovar,** *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA*

Session Co-Organizer: **Shikui Chen,** *State University of New York at Stony Brook, Stony Brook, NY, USA*

STRUCTURAL OPTIMIZATION OF INJECTION MOLDS WITH LATTICE COOLING
Technical Paper Publication. DETC2017-67975

Tong Wu, *Purdue University, Indianapolis, IN, USA,* ***Namrata Upadhyaya, Douglas Acheson, Andres Tovar,*** *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA*

COMPUTATIONAL DESIGN AND ADDITIVE MANUFACTURING OF PERIODIC CONFORMAL METASURFACES BY COMBINING TOPOLOGY OPTIMIZATION WITH RIEMANN MAPPING THEOREM
Technical Paper Publication. DETC2017-67024

Panagiotis Vogiatzis, *State University of New York at Stony Brook, Saint James, NY, USA,* ***Ming Ma, Shikui Chen, Xianfeng David Gu,*** *State University of New York at Stony Brook, Stony Brook, NY, USA*

MODELING SHEAR PERFORMANCE OF HIGH-SPEED RIDGED NAIL IN ALUMINUM JOINTS
Technical Paper Publication. DETC2017-68309

Sundeep Krishna Siripurapu, *The Ohio State University, Columbus, OH, USA,* ***Anthony Luscher,*** *Ohio State University, Columbus, OH, USA*

DAC-15-2: MULTI-OBJECTIVE OPTIMIZATION AND SENSITIVITY ANALYSIS 2

CONCOURSE LEVEL, ROOM 6 **11:00AM–12:00PM**

Session Organizer: **Jianhua Zhou,** *Shanghai Jiao Tong University, Shanghai, China*

Session Co-Organizer: **Paolo Cicconi,** *Università Politecnica Delle Marche, Ancona, AN, Italy*

A MANUFACTURING ORIENTED SINGLE POINT SEARCH HYPER-HEURISTIC SCHEME FOR MULTI-OBJECTIVE OPTIMIZATION
Technical Paper Publication. DETC2017-68265

Pei Cao, *University of Connecticut, Storrs, CT, USA,* ***Zhaoyan Fan,*** *Oregon State University, Corvallis, OR, USA,* ***Robert Gao,*** *Case Western Reserve University, Cleveland, OH, USA,* ***Jiong Tang,*** *University of Connecticut, Storrs Mansfield, CT, USA*

MULTI-OBJECTIVE DECISION MAKING OF A SIMPLIFIED CAR BODY SHAPE TOWARDS OPTIMUM AERODYNAMIC PERFORMANCE
Technical Paper Publication. DETC2017-67234

Kisun Song, Kyung Hak Choo, Jung-Hyun Kim, Dimitri Mavris, *Georgia Institute of Technology, Atlanta, GA, USA*

A PARAMETRIC OPTIMIZATION APPROACH OF AN INDUCTION HEATING SYSTEM FOR ENERGY CONSUMPTION REDUCTION
Technical Paper Publication. DETC2017-68020

Paolo Cicconi, Anna Costanza Russo, Mariorosario Prist, Andrea Monteriù, Francesco Ferracuti, Michele Germani, *Università Politecnica Delle Marche, Ancona, AN, Italy*

DFMLC-3-2: LIFE CYCLE DECISION MAKING

EXHIBIT HALL LEVEL, ROOM 21 **11:00AM–12:00PM**

Session Organizer: **Vijitashwa Pandey,** *Oakland University, Oakland, CA, USA*

Session Co-Organizer: **Steve Manieri,** *Università Politecnica delle Marche, Rome, Italy*

A LIFE CYCLE MODEL TO ASSESS COSTS AND ENVIRONMENTAL IMPACTS OF DIFFERENT MARITIME VESSEL TYPOLOGIES
Technical Paper Publication. DETC2017-68052

Claudio Favi, *Università degli Studi di Parma, Parma, Italy,* ***Michele Germani, Fabio Gregori, Alessio Vita, Roberto Raffaeli,*** *Universitã Politecnica Delle Marche, Ancona, Italy,* ***Steve Manieri,*** *Università Politecnica delle Marche, Rome, Italy*

IMPLEMENTATION OF AN OBJECT-ORIENTED LIFE CYCLE ASSESSMENT FRAMEWORK USING FUNCTIONAL ANALYSIS AND SYSTEMS ENGINEERING PRINCIPLES
Technical Paper Publication. DETC2017-68303

Shantanu Gadre, Marcos Esterman, Brian Thorn, *Rochester Institute of Technology, Rochester, NY, USA*

AUTONOMOUS WASTE CHARACTERIZATION IN ENVIRONMENTALLY CONSCIOUS DECISION MAKING
Technical Paper Publication. DETC2017-68365

Kevin Weinert, *Oakland University, Rochester, MI, USA,* ***Vijitashwa Pandey,*** *Oakland University, Oakland, CA, USA,* ***Sara Naranjo Corona,*** *Oakland University, Clarkston, MI, USA,* ***Aleksander Danielewski,*** *Oakland University, Rochester, MI, USA*

DFMLC-4-2: DESIGN FOR MANUFACTURING AND ASSEMBLY

EXHIBIT HALL LEVEL, ROOM 22 **11:00AM–12:00PM**

Session Organizer: **Joshua Summers,** *Clemson University, South Carolina, SC, USA*

Session Co-Organizer: **Beshoy Morkos,** *Florida Institute of Technology, Florida, FL, USA*

ANALYZING COMPOSITE MATERIAL MANUFACTURING METHODS USING FAILURE MODES EFFECT ANALYSIS
Technical Paper Publication. DETC2017-67368

Elisabeth Kames, *Florida Institute of Technology, Aurora, IL, USA,* ***Ryan Zaremba,*** *Florida Institute of Technology, Melbourne, FL, USA,* ***Beshoy Morkos,*** *Florida Institute of Technology, Florida, FL, USA*

PART CHANGE MANAGEMENT: A CASE STUDY ON AUTOMOTIVE OEM DEVELOPMENT AND PRODUCTION PERSPECTIVES
Technical Paper Publication. DETC2017-67615

Stephan Knackstedt, *Clemson University, Clemson, SC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA*

MODIFIED JACOBIAN-TORSOR BASED ERROR MODELING AND QUANTITATIVE SENSITIVITY ANALYSIS FOR SINGLE AXIS ASSEMBLY OF MACHINE TOOL
Technical Paper Publication. DETC2017-67716

Zhengchun Du, *Shanghai Jiaotong University, Shanghai, China,* ***Jian Wu, Jianguo Yang,*** *Shanghai Jiaotong University, Shanghai, China*

DTM-5-2: HUMAN BEHAVIOR IN DESIGN II

EXHIBIT HALL LEVEL, ROOM 20 **11:00AM–12:00PM**

Session Organizer: **Scott Ferguson,** *North Carolina State University, North Carolina, NC, USA*

Session Co-Organizer: **Saeema Ahmed-Kristensen,** *Imperial College, London, United Kingdom*

EYE GAZE EXPERIMENT INTO THE RECOGNITION OF INTENDED AFFORDANCES

Technical Paper Publication. DETC2017-67207

Leonardo Burlamaqui, *University of Sydney, Sydney, NSW, Australia,* ***Andy Dong,*** *University of Sydney, Sydney NSW, Australia*

UNDERSTANDING DESIGNERS BEHAVIOR IN PARAMETER DESIGN ACTIVITIES

Technical Paper Publication. DETC2017-68335

Turki Alelyani, Ye Yang, Paul T. Grogan, *Stevens Institute of Technology, Hoboken, NJ, USA*

A USER STUDY ON EXPLORING THE SEQUENCING OF UNIT CELL DESIGN GUIDELINES

Technical Paper Publication. DETC2017-67382

Mohammad Fazelpour, *University of Maryland, College Park, MD, USA,* ***Prabhu Shankar,*** *Clemson University, Clemson, SC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA,* ***Apurva Patel,*** *Clemson University, Clemson, SC, USA*

MR-10-1: AWARDS

CONCOURSE LEVEL, ROOM 1 **11:00AM–12:00PM**

Session Organizer: **Andrew P. Murray,** *University of Dayton, Dayton, OH, USA*

QUALITATIVE ANALYSIS AND DESIGN OF MECHANICAL METAMATERIALS

Technical Paper Publication. DETC2017-67992

Sreekalyan Patiballa, *University of Illinois, Urbana Champaign, Urbana, IL, USA,* ***Girish Krishnan,*** *UIUC, Urbana, IL, USA*

RIGIDLY FOLDABLE QUADRILATERAL MESHES FROM ANGLE ARRAYS

Technical Paper Publication. DETC2017-67440

Robert Lang, *Robert J. Lang Origami, Alamo, CA, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

MNS-1-2: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 13 **11:00AM–12:00PM**

Session Organizer: **Mohammad Younis,** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

Session Co-Organizer: **Slava Krylov,** *Tel Aviv University, Tel Aviv, Israel*

INTEGRATION OF PROCESS-INCOMPATIBLE MATERIALS FOR MICROFABRICATED POLYMER-BASED NEURAL INTERFACES

Christian A. Zorman, *Case Western Reserve University*

MESA-9-2: MECHATRONIC CONTROL AND ELECTRICAL VEHICULAR SYSTEMS (MCEVS) II

EXHIBIT HALL LEVEL, ROOM 14 **11:00AM–12:00PM**

Session Organizer: **Ferenc Szauter,** *Szechenyi Istvan University, Gyor, Hungary*

Session Co-Organizer: **Daniel Pup,** *Szechenyi Istvan University, Gyor, Hungary*

QUESTIONS REGARDING VEHICLE SAFETY AND THE MATHEMATICAL ANALYSIS OF SAFETY IN LARGE SCALE NETWORKS USING POSITIVE DYNAMIC SYSTEMS AND PROBABILITY THEORY METHODS

Technical Paper Publication. DETC2017-68021

Tamas Peter, *Budapest University of Technology and Economics, Budapest, Hungary,* ***István Lakatos,*** *Széchenyi István University, Gyor, Hungary,* ***Ferenc Szauter,*** *Szechenyi Istvan University, Gyor, Hungary,* ***Krisztian Szabo,*** *Hungarian Academy of Sciences – Institute for Computer Science and Control, Budapest, Hungary*

AN INTEGRATED ANALYSIS OF PROCESSES CONCERNING TRAFFIC AND VEHICLE DYNAMICS, DEVELOPMENT OF LABORATORY APPLYING REAL TRAFFIC SCENARIOS

Technical Paper Publication. DETC2017-68028

Tamas Peter, *Budapest University of Technology and Economics, Budapest, Hungary,* ***István Lakatos,*** *Széchenyi István University, Gyor, Hungary,* ***Daniel Pup, Ferenc Szauter,*** *Szechenyi Istvan University, Gyor, Hungary,* ***Krisztian Szabo,*** *Hungarian Academy of Sciences – Institute for Computer Science and Control, Budapest, Hungary*

RESEARCH OF VEHICLE PARAMETER AND SENSOR SYSTEMS NECESSARY TO CONTROL AUTONOMOUS VEHICLES

Technical Paper Publication. DETC2017-68034

Daniel Pup, Gabor Szakallas, Jozsef Polak, *Szechenyi Istvan University, Gyor, Hungary*

MESA-21-2: MICRO-/NANO-MANIPULATION TECHNOLOGIES AND APPLICATIONS (MNMTA) II

EXHIBIT HALL LEVEL, ROOM 19 **11:00AM–12:00PM**

Session Organizer: **Peng Yan,** *Shandong University, Jinan, China*

Session Co-Organizer: **Zhen Zhang,** *Tsinghua University, Beijing, China*

A GENERIC METHOD TO GENERATE AS-CURVE PROFILE IN COMMERCIAL MOTION CONTROLLER
Technical Paper Publication. DETC2017-68053

Youdun Bai, Xin Chen, Zhijun Yang, *Guangdong University of Technology, Guangzhou, Guangdong, China*

Nonlinear Response Compensation of Flexure-Hinge Based Guiding Mechanism Using Bi-Linear Control Input
Technical Paper Publication. DETC2017-68066

Zhijun Yang, Youdun Bai, Xin Chen, *Guangdong University of Technology, Guangzhou, Guangdong, China*

MSNDC-15-1: SOFTWARE TOOLS FOR COMPUTATIONAL DYNAMICS

BALLROOM LEVEL, ROOM 26-C **11:00AM–12:00PM**

Session Organizer: **Alexander Humer,** *Johannes Kepler University, Linz, Austria*

Session Co-Organizers: **Karin Nachbagauer,** *Upper Austria University of Applied Sciences, Wels, Austria,* **Ramin Masoudi,** *University of Waterloo, Waterloo, ON, Canada*

BENCHMARKING OF LINEARIZATION METHODS FOR MULTIBODY SYSTEM DYNAMICS
Technical Presentation. DETC2017-67204

Fran Gonzalez, *University of La Coruna, Ferrol, Spain,* ***Bruce Minaker,*** *University of Windsor, Windsor, ON, Canada,* ***Pierangelo Masarati,*** *Politecnico Di Milano, Milan, Italy,* ***Alberto Luaces, David Vilela, Javier Cuadrado,*** *University of La Coruna, Ferrol, Spain*

INVERSE DYNAMICS TOOLBOX FOR PARAMETER IDENTIFICATION IN FREQUENCY DOMAIN USING ADJOINT FOURIER COEFFICIENTS
Technical Presentation. DETC2017-67434

Karin Nachbagauer, *Upper Austria University of Applied Sciences, Wels, Austria,* ***Stefan Oberpeilsteiner, Thomas Lauss,*** *University of Applied Science Upper Austria, Wels, Austria,* ***Wolfgang Steiner,*** *University of Applied Sciences Upper Austria, Wels, Austria*

FLEXIBLE MULTIBODY SYSTEMS AND SMOOTHED-PARTICLE HYDRODYNAMICS FOR FLUID-STRUCTURE INTERACTION
Technical Presentation. DETC2017-68526

Markus Schörgenhumer, *Linz Center of Mechatronics, Linz, Austria,* ***Alexander Humer,*** *Johannes Kepler University, Linz, Austria,* ***Johannes Gerstmayr,*** *Leopold-Franzens University Innsbruck, Innsbruck, Austria*

PTG-9-2: KEYNOTE LECTURE

EXHIBIT HALL LEVEL, ROOM 16 **11:00AM–12:00PM**

Session Organizer: **Teik Lim,** *The University of Texas at Arlington, Fort Worth, TX, USA*

Session Co-Organizer: **Qi Fan,** *Gleason Corporation, Rochester, NY, USA*

ROLE OF TRANSMISSIONS IN ENABLING VEHICLE FUEL ECONOMY

Avinash Singh, *Global Propulsion Systems General Motors*

VIB-1-2: KEYNOTE LECTURE

BALLROOM LEVEL, ROOM 26A **11:00AM – 12:00PM**

Session Organizer: **Dumitru Caruntu,** *University of Texas Rio Grande Valley, Edinburg, TX, USA*

Session Co-Organizer: **Matthew Brake,** *William Marsh Rice University, Houston, TX, USA*

DEVELOPMENT OF LEAD-ZIRCONATE-TITANATE (PZT) THIN-FILM MICROACTUATORS FOR INNER EAR HEARING RE-HABILITATION
Keynote Presentation. DETC2017-68601

I. Y. (Steve) Shen, *University of Washington, Seattle, WA, USA*
**** 2017 Myklestad Awardee ****

AVT-3-2: ADVANCES IN METHODS FOR GROUND VEHICLE SYSTEMS DESIGN

EXHIBIT HALL LEVEL, ROOM 24 **2:00PM–3:40PM**

Session Organizer: **Massimiliano Gobbi,** *Politecnico di Milano, Milan, Italy*

Session Co-Organizers: **Guangqiang Wu,** *Tongji University, Shanghai, China,* **Lin Li,** Liebherr Mining Equipment, Newport News, VA, USA

A NOVEL PERFORMANCE ANALYSIS METHOD FOR A FULL VEHICLE SUSPENSION BASED ON QUARTER CAR MODEL
Technical Paper Publication. DETC2017-67343

Long Wu, *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

NUMERICAL AND EXPERIMENTAL STUDY OF RADIAL IMPACT TEST OF AN ALUMINUM WHEEL: TOWARDS INDUSTRY 4.0 VIRTUAL PROCESS ASSESSMENT
Technical Paper Publication. DETC2017-67703

Federico Ballo, *Politecnico Di Milano, Milan, Italy,* ***Roberto Frizzi,*** *Cromodora Wheels S.p.A, Ghedi, Italy,* ***Massimiliano Gobbi, Gianpiero Mastinu,*** *Politecnico di Milano, Milan, Italy,* ***Giorgio Previati,*** *Politecnico Di Milano, Milan, Italy,* ***Claudio Sorlini,*** *Cromodora Wheels S.p.A, Milan, Italy*

TEMPERATURE RISE REAL-TIME MEASUREMENT OF METRO TREAD BASED ON THE MULTI-SENSOR FUSION AND ONLINE COMPENSATION METHOD
Technical Paper Publication. DETC2017-68512

Jianyong Zuo, Guo Hu, Tiefeng Zhao, *Tongji University, Shanghai, China,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

DESIGN AND MANUFACTURING OF A CLUTCH AND BRAKE SYSTEM FOR INDOOR TIRE TESTING

Technical Paper Publication. DETC2017-67872

Aamir Khusru Khan, *Virginia Polytechnic Institute and State University, Blacksburg, VA, USA,* ***Corina Sandu,*** *Virginia Tech, Blacksburg, VA, USA*

PARAMETRIC DESIGN AND OPTIMIZATION OF THE IMPELLER GEOMETRY FOR AN AUTOMOTIVE TORQUE CONVERTER USING DOE METHOD

Technical Paper Publication. DETC2017-68259

Guangqiang Wu, Jie Chen, *Tongji University, Shanghai, China*

CIE-5-1: SIMULATION IN ADVANCED MANUFACTURING

CONCOURSE LEVEL, ROOM 5 **2:00PM–3:40PM**

Session Organizer: **Mahesh Mani,** *DOE-ERE, Washington, DC, USA*

Session Co-Organizer: **Jami J Shah,** *The Ohio State University, Columbus, OH, USA*

3D MACHINED SURFACE TOPOGRAPHY FORECASTING WITH SPACE-TIME MULTIOUTPUT SUPPORT VECTOR REGRESSION USING HIGH DEFINITION METROLOGY

Technical Paper Publication. DETC2017-67155

Yiping Shao, *Shanghai JiaoTong University, Shanghai, China,* ***Shichang Du,*** *Shanghai Jiao Tong University, Shanghai, China,* ***Lifeng Xi,*** *Shanghai JiaoTong University, Shanghai, China*

ENGINEERING PROCEDURE FOR POSITIVE DISPLACEMENT PUMP PERFORMANCE ANALYSIS BASED ON 1D AND 3D CFD COMMERCIAL CODES

Technical Paper Publication. DETC2017-67758

Aleksandar Josifovic, *University of Strathclyde, Glasgow, United Kingdom,* ***Aldo Iannetti,*** *Weir Advanced Research Centre, Glasgow, United Kingdom,* ***Jonathan Corney,*** *University of Strathclyde, Edinburgh Eh92dg, Scotland,* ***Matthew Stickland,*** *University of Strathclyde, Glasgow, Scotland*

A DATA SCIENCE APPROACH FOR ANALYSIS OF MULTI-PASS WIRE DRAWING

Technical Paper Publication. DETC2017-67839

Avadhut Sardeshmukh, Sreedhar Reddy, *Tata Consultancy Services Limited, Pune, Maharashtra, India,* ***Gautham Basavarsu,*** *Tata Research Development and Design Centre, Pune, India,* ***Amol Joshi,*** *TCS, Pune, Maharashtra, India,* ***Jitesh Panchal,*** *Purdue University, West Lafayette, IN, USA*

IN-PLANE DYNAMIC RESPONSE ANALYSIS OF HEXAGONAL AND REENTRANT HONEYCOMBS UNDER UNIAXIAL IMPACT LOADING

Technical Paper Publication. DETC2017-68134

Zhen Li, Qiang Gao, Liangmo Wang, *Nanjing University of Science and Technology, Nanjing, China,* ***Jun Tang,*** *Nanjing CREPREI Industrial Technology Research Institute, Nanjing, China*

INCORPORATING MANUFACTURING CONSTRAINTS IN TOPOLOGY OPTIMIZATION METHODS: A SURVEY

Technical Paper Publication. DETC2017-68192

Alok Sutradhar, *The Ohio State University, Columbus, OH, USA,* ***Jaejong Park,*** *The Ohio State University, Columbus, OH, USA,* ***Payam Haghighi, Jacob Kresslein,*** *The Ohio State University, Columbus, OH, USA,* ***Duane Detwiler,*** *Honda R & D Americas Inc, Raymond, OH, USA,* ***Jami J. Shah,*** *The Ohio State University, Columbus, OH, USA*

CIE-6-3: AMS/SEIKM/CAPPD: DESIGN, SIMULATION AND OPTIMIZATION FOR ADDITIVE MANUFACTURING III

CONCOURSE LEVEL, ROOM 4 **2:00PM–3:40PM**

Session Organizer: **John Michopoulos,** *Naval Research Laboratory, Washington, DC, USA*

THREE-DIMENSIONAL OBJECT REALIZATION VIA DIRECT VOLUMETRIC ACTIVATION

Technical Paper Publication. DETC2017-67888

Andrew J. Birnbaum, Athanasios Iliopoulos, *US Naval Research Laboratory, Washington, DC, USA,* ***John Steuben,*** *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***John Michopoulos,*** *Naval Research Laboratory, Washington, DC, USA*

CONTRASTING FUNCTIONS WITH AFFORDANCES IN DESIGN FOR ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-68157

Hyunwoong Ko, *Singapore Centre for 3D Printing, School of Mechanical and Aerospace, Nanyang Technological University, Singapore,* ***Seung Ki Moon,*** *Nanyang Technological University, Singapore*

INFLUENCE OF PRINTING ORIENTATION ON THE DYNAMIC CHARACTERISTICS AND VIBRATION BEHAVIOR OF 3D PRINTED STRUCTURES

Technical Paper Publication. DETC2017-68289

Kumar Vikram Singh, Fazeel Khan, Jacob Veta, *Miami University, Oxford, OH, USA,* ***Anil Kumar Singh,*** *Loknayak Jaiprakash Institute of Technology, Saran, Bihar, India*

DESIGN RULES FOR ADDITIVE MANUFACTURING: A CATEGORIZATION

Technical Paper Publication. DETC2017-68446

Mahesh Mani, *Dakota Consultancy Inc./NIST, Gaithersburg, MD, USA,* ***Paul Witherell,*** *NIST, Gaithersburg, MD, USA,* ***Haeseong Jee,*** *Hong Ik University, Seoul, Korea, Korea (Republic)*

A DOMAIN DRIVEN APPROACH TO METAMODELING IN ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-67807

Zhuo Yang, Thomas Hagedorn, *University of Massachusetts at Amherst, Amherst, MA, USA,* ***Douglas Eddy,*** *University of Massachusetts Amherst, Amherst, MA, USA,* ***Sundar Krishnamurty,*** *University of Massachusetts-Amherst, Amherst, MA, USA,* ***Ian Grosse,*** *University of Massachusetts, Amherst, MA, USA,* ***Peter Denno, Yan Lu, Paul Witherell,*** *NIST, Gaithersburg, MD, USA*

SESSION CIE-33-1: CIE MANUFACTURING PANEL

CONCOURSE LEVEL, ROOM 3 **2:00PM–3:40PM**

Session Organizer: **Mahesh Mani,** *DOE-ERE, Washington, DC, USA*

Panelists Details Not Available at Press Time

DAC-5-2: DESIGN AND OPTIMIZATION OF SUSTAINABLE ENERGY SYSTEMS 2

CONCOURSE LEVEL, ROOM 7 **2:00PM–3:40PM**

Session Organizer: **Erin MacDonald,** *Stanford University, Stanford, CA, USA*

Session Co-Organizer: **Jie Zhang,** *University of Texas at Dallas, Richardson, TX, USA*

DESIGN OF AN AGENT-BASED TECHNIQUE FOR CONTROLLING INTERCONNECTED DISTRIBUTED ENERGY RESOURCE TRANSACTIONS

Technical Paper Publication. DETC2017-68346

Samantha Janko, *Arizona State University, Gilbert, AZ, USA,* ***Nathan Johnson,*** *Arizona State University, Mesa, AZ, USA*

TWO STAGE MINI-MAX ALGORITHM FOR GRID-BASED WIND FARM LAYOUT OPTIMIZATION

Technical Paper Publication. DETC2017-67535

Ning Quan, Harrison Kim, *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

EXAMINING THE INFLUENCE OF SOLAR PANEL INSTALLERS ON DESIGN INNOVATION AND MARKET PENETRATION

Technical Paper Publication. DETC2017-68338

Ekaterina Sinitskaya, Kelley Gomez, *Stanford University, Stanford, CA, USA,* ***Qifang Bao, Maria Yang,*** *MIT, Cambridge, MA, USA,* ***Erin MacDonald,*** *Stanford University, Stanford, CA, USA*

AN EXPERIMENTAL PARAMETRIC STUDY OF AIR-BASED BATTERY THERMAL MANAGEMENT SYSTEM FOR ELECTRIC VEHICLES

Technical Paper Publication. DETC2017-67841

Yuanzhi Liu, Mao Li, Jie Zhang, *University of Texas at Dallas, Richardson, TX, USA*

DAC-6-1: DESIGN FOR ADDITIVE MANUFACTURING 1

CONCOURSE LEVEL, ROOM 8 **2:00PM–3:40PM**

Session Organizer: **James Guest,** *Johns Hopkins University, Lutherville Timonium, MD, USA*

Session Co-Organizer: **Wentao Fu,** *Siemens, Orlando, FL, USA*

GRADIENT BASED MULTI-COMPONENT TOPOLOGY OPTIMIZATION FOR ADDITIVE MANUFACTURING (MTO-A)

Technical Paper Publication. DETC2017-68207

Yuqing Zhou, Kazuhiro Saitou, *University of Michigan, Ann Arbor, MI, USA*

EXPERIMENT DRIVEN LOCAL OPTIMIZATION (EDLO) WITH AN APPLICATION TO ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-67921

Joshua Hamel, *Seattle University, Seattle, WA, USA*

CAD-INTEGRATED COST ESTIMATION AND BUILD ORIENTATION OPTIMIZATION TO SUPPORT DESIGN FOR METAL ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-68376

Michael Barclift, *Penn State University, State College, PA, USA,* ***Andrew Armstrong,*** *USCGA, New London, CT, USA,* ***Timothy W. Simpson,*** *Penn State University, University Park, PA, USA,* ***Sanjay Joshi,*** *Penn State University, University Park, PA, USA*

OPTIMAL DESIGN OF TOPOLOGY AND GRADIENT ORTHOGONAL MATERIAL

Technical Paper Publication. DETC2017-67852

Anthony Garland, *Clemson University, Clemson, SC, USA,* ***Georges Fadel,*** *Clemson University, Clemson, SC, USA*

DAC-16-2: MULTIDISCIPLINARY DESIGN OPTIMIZATION 2

CONCOURSE LEVEL, ROOM 6 **2:00PM–3:40PM**

Session Organizer: **John Hall,** *University at Buffalo, Buffalo, NY, USA*

Session Co-Organizer: **Scott Ferguson,** *North Carolina State University, North Carolina, NC, USA*

VALUE-DRIVEN DESIGN USING DISCIPLINE-BASED DECOMPOSITION FOR A FAMILY OF FRONT-LOADING WASHING MACHINES

Technical Paper Publication. DETC2017-67631

Sangjin Jung, Timothy W. Simpson, *Penn State University, University Park, PA, USA,* ***Christina Bloebaum,*** *Iowa State University/Dept of Aerospace Eng, Ames, IA, USA*

DIMENSION REDUCTION AND DECOMPOSITION USING CAUSAL GRAPH AND QUALITATIVE ANALYSIS FOR AIRCRAFT CONCEPT DESIGN OPTIMIZATION

Technical Paper Publication. DETC2017-67601

Di Wu, *Simon Fraser University (Surrey Campus), Surrey, BC, Canada,* ***Eric Coatanea,*** *Tampere University of Technology, Tampere, Finland,* ***G. Gary Wang,*** *Simon Fraser University, Surrey, BC, Canada*

PARAMETRIC SHAPE & TOPOLOGY OPTIMIZATION: A NEW LEVEL SET APPROACH BASED ON CARDINAL KERNEL FUNCTIONS
Technical Paper Publication. DETC2017-67266

Long Jiang, *SUNY–Stony Brook, Nesconset, NY, USA,* ***Shikui Chen, Xiangmin Jiao,*** *State University of New York at Stony Brook, Stony Brook, NY, USA*

A SYSTEMATIC APPROACH TO IDENTIFYING A SET OF FEASIBLE DESIGNS
Technical Paper Publication. DETC2017-68003

Hyeongmin Han, *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Sehyun Chang,*** *Hyundai Motor Company, Seoul, Korea (Republic),* ***Harrison Kim,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

DEC-2-1: TEAMING AND COLLABORATION IN DESIGN EDUCATION

EXHIBIT HALL LEVEL, ROOM 23 **2:00PM–3:40PM**

Session Organizer: **Zahed Siddique,** *University of Oklahoma, Norman, OK, USA*

Session Co-Organizer: **Joshua Summers,** *Clemson University, South Carolina, SC, USA*

TOWARDS A BETTER DESIGN TEAM FORMATION: A REVIEW OF TEAM EFFECTIVENESS MODELS AND POSSIBLE MEASUREMENTS OF DESIGN-TEAM INPUTS, PROCESSES, AND OUTPUTS
Technical Paper Publication. DETC2017-68091

Shun Takai, *Northern Illinois University, DeKalb, IL, USA,* ***Marcos Esterman,*** *Rochester Institute of Technology, Rochester, NY, USA*

A CASE STUDY OF THE EFFECTS OF DESIGN PROJECT LENGTH ON TEAM COLLABORATION AND LEADERSHIP IN SENIOR MECHANICAL ENGINEERING PROJECTS
Technical Paper Publication. DETC2017-68197

James Righter, *Clemson University, Clemson, SC, USA,* ***Andrew Blanton,*** *Clemson University, Aiken, SC, USA,* ***Hallie Stidham, Doug Chickarello,*** *Clemson University, Clemson, NC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA*

QUANTIFYING THE MISMATCH BETWEEN COURSE CONTENT AND STUDENTS' DIALOGUE IN ONLINE LEARNING ENVIRONMENTS
Technical Paper Publication. DETC2017-67339

Sunghoon Lim, Conrad Tucker, *Penn State University, State College, PA, USA,* ***Kathryn Jablokow,*** *Penn State University, Malvern, PA, USA,* ***Barton Pursel,*** *Penn State University, State College, PA, USA*

COMPARISON OF COLLECTIVE TEAM AND INDIVIDUAL STUDENT PEER FEEDBACK ON DESIGN
Technical Paper Publication. DETC2017-67800

Mahender Mandala, *University of Pittsburgh, Pittsburgh, PA, USA,* ***Erin Cole,*** *Brown University, Providence, RI, USA,* ***Christian Schunn, Mary Goldberg,*** *University of Pittsburgh, Pittsburgh, PA, USA,* ***Jon Pearlman,*** *VA Pittsburgh Healthcare System / Univ. of Pittsburgh, Pittsburgh, PA, USA*

THE SOCIAL IMPACT OF STEM, EXPERIENCED: STUDIES WITH AN ENGINEERING DESIGN CONCEPT FOR SMART DEVICES
Technical Paper Publication. DETC2017-68399

Larissa Nietner, David Wallace, *MIT, Cambridge, MA, USA*

DFMLC-5-1: DESIGN FOR SUSTAINABLE ADDITIVE MANUFACTURING

EXHIBIT HALL LEVEL, ROOM 21 **2:00PM–3:40PM**

Session Organizer: **Karl Haapala,** *Oregon State University, Oregon, OR, USA*

Session Co-Organizer: **Junfeng Ma,** *Mississippi State University, Mississippi, MS, USA*

RECONSTRUCTION TECHNOLOGY OF THE PART?S INTERNAL STRUCTURE BASED ON UNIT BLOCK LIBRARY
Technical Paper Publication. DETC2017-67761

Zhang Qingbiao, *National University of Defense Technology, ChangSha, Hunan, China,* ***Tang Li, Zhang Zhixiong,*** *National University of Defense Technology, Changesha, Hunan, China,* ***Liang Keshan,*** *National University of Defense Technology, Changsha, Hunan, China,* ***Cao Yujun, Zhao Xiqing,*** *National University of Defense Technology, Changesha, Hunan, China*

A PRELIMINARY EXPERIMENTAL STUDY OF ADDITIVE MANUFACTURING ENERGY CONSUMPTION
Technical Paper Publication. DETC2017-67864

Daniel Dunaway, James Harstvedt, *Mississippi State University, Mississippi State, MS, USA,* ***Junfeng Ma,*** *Mississippi State University, Mississippi, MS, USA*

PART SEPARATION METHODS FOR ASSEMBLY BASED DESIGN IN ADDITIVE MANUFACTURING
Technical Paper Publication. DETC2017-68002

Yosep Oh, *University at Buffalo, Buffalo, NY, USA,* ***Sara Behdad,*** *University at Buffalo, SUNY, New York, United Kingdom,* ***Chi Zhou,*** *University at Buffalo, Amherst, NY, USA*

DESIGN OF VARIABLE-DENSITY STRUCTURES FOR ADDITIVE MANUFACTURING USING GYROID LATTICES
Technical Paper Publication. DETC2017-68047

Botao Zhang, Kunal Mhapsekar, Sam Anand, *University of Cincinnati, Cincinnati, OH, USA*

EXPLORATION OF VARIOUS METHODS FOR COST CONSIDERATIONS IN ADDITIVE MANUFACTURING
Technical Paper Publication. DETC2017-68405

Andrea Piazza, Kyle Bielanos, *Florida Institute of Technology, Melbourne, FL, USA,* ***Beshoy Morkos,*** *Florida Institute of Technology, Florida, FL, USA*

DFMLC-8-1: CONCEPTUAL DESIGN AND MANUFACTURING ANALYSIS

EXHIBIT HALL LEVEL, ROOM 22 **2:00PM–3:40PM**

Session Organizer: **Qingjin Peng,** *University of Manitoba, Manitoba, MB, Canada*

Session Co-Organizer: **Giovanni Muscolo,** *Italian Institute of Technology, Pisa, Italy*

BODY GESTURE-BASED USER INTERACTION IN DESIGN REVIEW

Technical Paper Publication. DETC2017-67415

Yu Xiao, *University of Manitoba, Winnipeg, MB, Canada,* ***Qingjin Peng,*** *University of Manitoba, Manitoba, MB, Canada*

AN INTERACTIVE DESIGN METHOD BASED ON DUAL-DOMAIN TRANSFORMATIONS

Technical Paper Publication. DETC2017-67702

Yunhui Liu, *University of Manitoba, Winnipeg, MB, Canada,* ***Qingjin Peng,*** *University of Manitoba, Manitoba, MB, Canada,* ***Yu Xiao,*** *University of Manitoba, Winnipeg, MB, Canada,* ***Jian Zhang, Peihua Gu,*** *Shantou University, Shantou, China*

CONCEPTUAL AND FUNCTIONAL DESIGN OF A ROBOTICS CHAMFERING TOOL FOR WOODEN BEAMS

Technical Paper Publication. DETC2017-68046

Giovanni Muscolo, *Italian Institute of Technology, Pisa, Italy,* ***Darwin Caldwell,*** *Italian Institute of Technology, Genova, Italy,* ***Ferdinando Cannella,*** *Istituto Italiano di Tecnologia, Polverigi (AN), Italy*

DEVELOPING AND COMPARING ALTERNATIVE DESIGN OPTIMIZATION FORMULATIONS FOR A VIBRATION ABSORBER EXAMPLE

Technical Paper Publication. DETC2017-68337

Siyao Luan, *University of Illinois, Urbana, IL, USA,* ***Madhav Arora,*** *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***Deborah Thurston,*** *University of Illinois at Urbana-Champaign, Chicago, CA, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

ENHANCING ECONOMIC AND ENVIRONMENTAL SUSTAINABILITY BENEFITS ACROSS THE DESIGN AND MANUFACTURING OF MEDICAL DEVICES: A CASE STUDY OF ANKLE FOOT ORTHOSIS

Technical Paper Publication. DETC2017-68427

Amin Mirkouei, *University of Idaho, Idaho Falls, ID, ID, USA,* ***Bishal Silwal,*** *Georgia Southern University, Statesboro, GA, USA,* ***Lawrence Ramiscal,*** *Augusta University, Augusta, GA, USA*

DTM-1-2: CREATIVITY IDEATION II

EXHIBIT HALL LEVEL, ROOM 20 **2:00PM–3:40PM**

Session Organizer: **Lucienne Blessing,** *Singapore University of Technology and Design, Singapore*

Session Co-Organizer: **Noe Vargas Hernandez,** *The University of Texas Rio Grande Valley, Edinburg, TX, USA*

A NETWORK-BASED COMPUTATIONAL MODEL FOR CREATIVE KNOWLEDGE DISCOVERY BRIDGING HUMAN-COMPUTER INTERACTION AND DATA MINING

Technical Paper Publication. DETC2017-67228

Liuqing Chen, Feng Shi, Ji Han, Peter Childs, *Imperial College London, London, United Kingdom*

COMPARING FACETS OF DIVERGENT THINKING IN ENGINEERING FRESHMEN AND UPPERCLASSMEN

Technical Paper Publication. DETC2017-67604

Caleb Bennetts, *LeTourneau University, Tulsa, OK, USA,* ***Avery Cheeley, Benjamin W. Caldwell, Matthew Green,*** *LeTourneau University, Longview, TX, USA*

DEMOGRAPHIC FACTORS AND THEIR INFLUENCE ON DESIGNER CREATIVITY AND EMPATHY EVOKED THROUGH USER EXTREME CONDITIONS

Technical Paper Publication. DETC2017-68380

Sujithra Raviselvam, Roozbeh Sanaei, *Singapore University of Technology and Design, Singapore,* ***Kristin Wood,*** *Singapore University of Technology and Design, Singapore 487372, Singapore,* ***Katja Holtta-Otto,*** *Aalto University, Espoo, Finland,* ***Lucienne Blessing,*** *Singapore University of Technology and Design, Singapore*

INVESTIGATING PROBLEM SIMILARITY THROUGH STUDY OF BETWEEN-SUBJECT AND WITHIN-SUBJECT EXPERIMENTS

Technical Paper Publication. DETC2017-68428

Bryan Levy, Ethan Hilton, Julie Linsey, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Megan Tomko,*** *Georgia Institute of Technology, Atlanta, GA, USA*

DESIGN WHODUNIT: THE RELATIONSHIP BETWEEN INDIVIDUAL CHARACTERISTICS AND INTERACTION BEHAVIOR IN DE-SIGN CONCEPT GENERATION

Technical Paper Publication. DETC2017-68239

Neeraj Sonalkar, *Stanford University, Stanford, CA, USA,* ***Kathryn Jablokow,*** *Penn State University, Malvern, PA, USA,* ***Jonathan Edelman,*** *Royal College of Arts, London, United Kingdom,* ***Ade Mabogunje, Larry Leifer,*** *Stanford University, Stanford, CA, USA*

MR-4-7: ACOUSTIC & ANTENNA APPLICATIONS

EXHIBIT HALL LEVEL, ROOM 9 **2:00PM–3:40PM**

Session Organizer: **Yan Chen,** *Tianjin University, Tianjin, China*

Session Co-Organizer: **Craig Lusk,** *The University of South Florida, Lutz, FL, USA*

FOLDING STAR-SHAPED ACOUSTIC TRANSDUCERS FOR REAL-TIME GUIDANCE OF RADIATED ACOUSTIC WAVES

Technical Paper Publication. DETC2017-67286

Chengzhe Zou, Ryan L. Harne, *The Ohio State University, Columbus, OH, USA*

DESIGN OF MIURA-ORI PATTERNS WITH ACOUSTIC BANDGAPS

Technical Paper Publication. DETC2017-67384

Phanisri Pratapa, Phanish Suryanarayana, Glaucio Paulino, *Georgia Institute of Technology, Atlanta, GA, USA*

FREQUENCY RECONFIGURABLE QHA BASED ON KAPTON ORIGAMI HELICAL TUBE FOR GPS, RADIO AND WIMAX APPLICATIONS

Technical Paper Publication. DETC2017-68048

Xueli Liu, Shun Yao, John Gibson, Stavros V. Georgakopoulos, *Florida International University, Miami, FL, USA*

ANALYSIS AND DESIGN OF AN ACTIVE SELF-FOLDING ANTENNA

Technical Paper Publication. DETC2017-67855

Edwin Peraza Hernandez, Darren Hartl, Dimitris Lagoudas, *Texas A&M University, College Station, TX, USA*

DESIGNING FOR POWER TRANSFER ACROSS FOLD-LINES IN MECHANISMS WITH ORIGAMI-LIKE MOVEMENT USING SURROGATE FOLDS

Technical Paper Publication. DETC2017-68370

Jason T. Allen, Bryce P. DeFigueiredo, Spencer P. Magleby, *Brigham Young University, Provo, UT, USA*

MR-6-1: PLANAR AND SPATIAL MECHANISMS

[Cross-listed with MSNDC-16]

EXHIBIT HALL LEVEL, ROOM 10 **2:00PM–3:40PM**

Session Organizer: **Hao Wang,** *Shanghai Jiao Tong University, Shanghai, China*

Session Co-Organizer: **Dimiter Zlatanov,** *University of Genoa, Genoa, Italy*

VARIATIONAL ANALYSIS OF A TWO LINK SLIDER-CRANK MECHANISM USING POLYNOMIAL CHAOS THEORY

Technical Paper Publication. DETC2017-67328

Paul S. Ryan, *Marquette University, Milwaukee, WI, USA,* ***Sarah C. Baxter,*** *University of St. Thomas, Saint Paul, MN, USA,* ***Philip Voglewede,*** *Marquette University, Milwaukee, WI, USA*

A COMPUTATIONAL METHOD FOR FORMULATION AND SOLUTION OF DYNAMICAL EQUATIONS FOR COMPLEX MECHANISMS AND MULTIBODY SYSTEMS

Technical Paper Publication. DETC2017-67766

Kristopher Wehage, *Jet Propulsion Laboratory, Pasadena, CA, USA,* ***Bahram Ravani,*** *University of California, Davis, Davis, CA, USA*

NEW PSEUDO-RIGID-BODY MODELS FOR DYNAMICS OF COMPLIANT ROBOTIC LINKS

Technical Paper Publication. DETC2017-67949

Yu She, Deshan Meng, Hai-Jun Su, *The Ohio State University, Columbus, OH, USA*

DESIGN PROCESS OF HIGH-DYNAMICS MULTI-LINK FLEXIBLE ROBOT MANIPULATORS

Technical Paper Publication. DETC2017-67721

Thomas Solatges, *SITIA, Bouguenais, France,* ***Mathieu Rognant,*** *ONERA, Toulouse, France,* ***Sébastien Rubrecht,*** *SITIA, Bouguenais, France,* ***Eric Courteille,*** *Université Européenne de Bretagne, INSA-LGCGM-EA 3913, Rennes, France,* ***Philippe Bidaud,*** *ONERA, Palaiseau, France*

DYNAMIC OPTIMIZATION OF POINTING TRAJECTORIES EXPLOITING THE REDUNDANCY OF PARALLEL WRISTS

Technical Paper Publication. DETC2017-67546

David Corinaldi, *Università Politecnica delle Marche, Ancona, AN, Italy,* ***Massimo Callegari,*** *Polytechnic University of Marche, Ancona, Italy,* ***Matteo Palpacelli, Giacomo Palmieri, Luca Carbonari,*** *Università Politecnica delle Marche, Ancona, Italy*

MR-8-7: MOBILE ROBOTIC SYSTEMS

EXHIBIT HALL LEVEL, ROOM 11 **2:00PM–3:40PM**

Session Organizer: **Clement Gosselin,** *Laval University, Quebec, QC, Canada*

Session Co-Organizer: **David Cappelleri,** *Purdue University, West Lafayette, IN, USA*

MODULAR ELASTIC LATTICE PLATFORM FOR RAPID PROTOTYPING OF TENSEGRITY ROBOTS

Technical Paper Publication. DETC2017-68264

Lee-Huang Chen, Mallory C. Daly, Andrew P. Sabelhaus, Lara A. Janse van Vuuren, Hunter J. Garnier, Mariana I. Verdugo, Ellande Tang, *University of California, Berkeley, Berkeley, CA, USA,* ***Carielle Spangenberg,*** *University of California, Berkeley, Martinez, CA, USA,* ***Faraz Ghahani, Alice Agogino,*** *University of California, Berkeley, Berkeley, CA, USA,* ***Adrian Agogino,*** *NASA Ames Research Center, Moffett Field, CA, USA*

DESIGN AND ANALYSIS OF REDUCED DEGREE-OF-FREEDOM MODULAR SNAKE ROBOT

Technical Paper Publication. DETC2017-67377

Peter Racioppo, Wael Saab, Pinhas Ben-Tzvi, *Virginia Tech, Blacksburg, VA, USA*

DEVELOPING A KINEMATICALLY SIMILAR MASTER DEVICE FOR EXTENSIBLE CONTINUUM ROBOT MANIPULATORS
Technical Paper Publication. DETC2017-67321

Chase Frazelle, Apoorva Kapadia, Ian Walker, *Clemson University, Clemson, SC, USA*

DESIGN OF A NEW WAIST FOR A HEXAPOD ROBOT WITH PARALLEL LEG MECHANISM TO INCREASE ITS STAIR-CLIMBING CAPABILITY
Technical Paper Publication. DETC2017-67670

Jimu Liu, Feng Gao, Xianbao Chen, *Shanghai Jiao Tong University, Shanghai, China*

ON-LINE TASK DECOMPOSITION FOR COLLABORATIVE SURVEILLANCE OF MARINE ENVIRONMENT BY A TEAM OF UNMANNED SURFACE VEHICLES
Technical Paper Publication. DETC2017-67972

Shaurya Shriyam, Brual Shah, Satyandra Gupta, *University of Southern California, Los Angeles, CA, USA*

MNS-2-1: 2D MEMS/NEMS

[Cross-listed with VIB-12]

EXHIBIT HALL LEVEL, ROOM 13 **2:00PM–3:40PM**

Session Organizer: **Arend Van Der Zande,** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

Session Co-Organizer: **Mohammad Younis,** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

HIGHLY TUNABLE NANO-ELECTRO-MECHANICAL SYSTEMS FROM 2D MATERIAL BIMORPHS.
Technical Presentation. DETC2017-67997

Arend Van Der Zande, *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

ELECTROSTATICALLY TUNABLE NANOMECHANICAL SHALLOW ARCHES
Technical Paper Publication. DETC2017-67845

Syed N. R. Kazmi, *King Abdullah University of Science and Technology, Thuwal, Makkah, Saudi Arabia,* ***Amal Z. Hajjaj,*** *King Abdullah University of Science and Technology, Makkah Province, Saudi Arabia,* ***Pedro M. F. J Costa,*** *King Abdullah University of Science and Technology, Thuwal, Makkah, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

ON THE USAGE OF BERGER'S MODEL FOR ELECTROSTATICALLY ACTUATED CIRCULAR CURVED MICRO PLATES
Technical Paper Publication. DETC2017-67523

Lior Medina, *Tel Aviv University, Tel Aviv, Israel,* ***Rivka Gilat,*** *Ariel University, Ariel, Israel,* ***Slava Krylov,*** *Tel Aviv University, Tel Aviv, Israel*

NONLINEAR STATIC AND DYNAMIC BEHAVIOR OF ANIMPERFECT CIRCULAR MICROPLATE UNDER ELECTROSTATIC ACTUATION
Technical Paper Publication. DETC2017-67996

Aymen Jallouli, *University Bourgogne Franche-Comte, Besancon, France,* ***Najib Kacem,*** *Univ. Bourgogne Franche-Comte, Besançon, France,* ***Joseph Lardies,*** *UniversityBourgogne Franche-Comte, FEMTO-ST Institute, Besancon, France*

THE RESONANT BEHAVIOR OF MEMS-BASED SINGLE CRYSTALLINE AND POLYCRYSTALLINE 3C-SIC DIAPHRAGMS
Technical Presentation. DETC2017-68534

Yongkun Sui, Hao Chong, Kailey Shara, Christian Zorman, *Case Western Reserve University, Cleveland, OH, USA*

MESA-6-3: FRACTIONAL DERIVATIVES AND THEIR APPLICATIONS (FDTA) III

EXHIBIT HALL LEVEL, ROOM 14 **2:00PM–3:40PM**

Session Organizer: **Yangquan Chen,** *University of California Merced, Merced, CA, USA*

DISTURBANCE REJECTION FOPID CONTROL OF ROTOR BY MULTI-OBJECTIVE BB-BC OPTIMIZATION ALGORITHM
Technical Paper Publication. DETC2017-67283

Abdullah Ates, Baris Baykant Alagoz, Celaleddin Yeroglu, *Inonu University, Malatya, Turkey,* ***Jie Yuan,*** *Southeast University, Nanjing, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

ADAPTIVE FRACTIONAL-ORDER FAULT TOLERANT TRACKING CONTROL FOR UAV BASED ON HIGH-GAIN OBSERVER
Technical Paper Publication. DETC2017-67479

Ziquan Yu, *Northwestern Polytechnical University, Xi'an, China,* ***Youmin Zhang,*** *Mechanical & Industrial Eng, Concordia Univ., Montreal, QC, Canada,* ***Yaohong Qu, Zhewen Xing,*** *Northwestern Polytechnical University, Xi'an, China*

ENERGY INFORMATICS AND FRACTIONAL CALCULUS
Technical Paper Publication. DETC2017-67485

Kai Liu, Xi Zhang, *China University of Mining Technology Beijing, China,* ***Yangquan Chen,*** *University of California Merced, Merced, CA, USA*

THE INVERTED DECOUPLING BASED FRACTIONAL ORDER TWO-INPUT-TWO-OUTPUT IMC CONTROLLER
Technical Paper Publication. DETC2017-67634

Dazi Li, *Beijing University of Chemical Technology, Beijng, China,* ***Xingyu He,*** *Beijing University of Chemical Technology, Beijing, China*

WELL-POSEDNESS OF FRACTIONAL DIFFERENTIAL EQUATIONS
Technical Paper Publication. DETC2017-67099

Changpin Li, Li Ma, *Shanghai University, Shanghai, China*

MESA-22-2: MESA-22 DISTURBANCE REJECTION CONTROL (DRC) II

EXHIBIT HALL LEVEL, ROOM 19 **2:00PM–3:40PM**

Session Organizer: **Huiyu Jin,** *Xiamen University/UC Irvine, Irvine, CA, USA*

Session Co-Organizer: **Eric William Zurita-Bustamante,** *Cinvestav, Mexico City, Mexico*

ON THE ADRC OF NON-DIFFERENTIALLY FLAT, UNDERACTUATED, NONLINEAR SYSTEMS: AN EXPERIMENTAL CASE STUDY
Technical Paper Publication. DETC2017-67126

Hebertt Sira-Ramirez, *CINVESTAV, Mexico, Mexico,* ***Eric William Zurita-Bustamante,*** *Cinvestav, Mexico City, N/A, Mexico,* ***Efrain Hernandez-Flores,*** *CINVESTAV, Mexico, Mexico*

LOWER-ORDER ACTIVE DISTURBANCE REJECTION CONTROL AND FREQUENCY ANALYSIS OF HIGH ORDER SYSTEM
Technical Paper Publication. DETC2017-67127

Ruiqing Zhang, Shubo Zhang, *Cleveland State University, Cleveland, OH, USA,* ***Yali Xue,*** *Tsinghua University, Beijing, China,* ***Yu Hu,*** *Cleveland State University, Cleveland, OH, USA,* ***Wendi Wang,*** *Hebei Agricultural University, Baoding, China*

EXTENDED STATE OBSERVER BASED ASCENT TRAJECTORY TRACKING METHOD
Technical Paper Publication. DETC2017-67131

Wenming Nie, Huifeng Li, Ran Zhang, *Beihang University, Beijing, China,* ***Bo Liu,*** *Chinese Academy of Sciences, Beijing, China*

A PRACTICAL CONTROL STRATEGY FOR SOLID OXIDE FUEL CELLS BASED ON ACTIVE DISTURBANCE REJECTION CONTROL: A COMPARISON WITH MODEL PREDICTIVE CONTROL
Technical Paper Publication. DETC2017-67122

Li Sun, Lei Pan, *Southeast University, Nanjing, China,* ***Yali Xue, Donghai Li,*** *Tsinghua University, Beijing, China, Zhenlong Wu, China, Beijing, China*

MSNDC-17-1: LYAPUNOV AWARD LECTURE & AUTONOMOUS AND CONNECTED VEHICLES

BALLROOM LEVEL, ROOM 26A **2:00PM–5:40PM**

Session Organizer: **Dan Negrut,** *University of Wisconsin, Madison, WI, USA*

Session Co-Organizer: **Radu Serban,** *University of Wisconsin Madison, Madison, WI, USA*

FROM UNDERSTANDING NONLINEAR PHENOMENA TO EXPLOITING GLOBAL DYNAMICS FOR ENGINEERING SAFETY
Award Lecture. DETC2017-68550

Giuseppe Rega, *Sapienza University of Rome, Rome, Italy*

VEHICLE AUTOMATION – BEYOND THE PR
Keynote Presentation. DETC2017-68553

Joshua Every, *Transportation Research Center, East Liberty, OH, USA*

THE CHALLENGES OF AN EFFECTIVE BASE MAP FOR AUTONOMOUS VEHICLES
Keynote Presentation. DETC2017-68551

Eric Nutt, *Mandli Communications, Inc., Fitchburg, WI, USA*

AUTOMATED VEHICLES: CURRENT LANDSCAPE AND FUTURE DIRECTIONS
Keynote Presentation. DETC2017-68554

Carmine Senatore, *Exponent, Inc., Natick, MA, USA*

PTG-2-2: GEAR ANALYSIS, MATERIALS, FATIGUE (2)

EXHIBIT HALL LEVEL, ROOM 16 **2:00PM–3:40PM**

Session Organizer: **Mohsen Kolivand,** *American Axle and Manufacturing Inc., Detroit, MI, USA*

Session Co-Organizer: **Kwun-Lon Ting,** *Tennessee Technological University, Cookeville, TN, USA*

A LOAD DISTRIBUTION MODEL FOR PLANETARY GEAR SETS
Technical Paper Publication. DETC2017-68354

Yong Hu, *The Ohio State University, Columbus, OH, USA,* ***David Talbot,*** *Ohio State University | OSU, Columbus, OH, USA,* ***Ahmet Kahraman,*** *Ohio State University, Columbus, OH, USA*

TESTING AEROSPACE GEARS FOR PITTING, BENDING FATIGUE, AND SCUFFING
Technical Presentation. DETC2017-68007

Timothy Krantz, *NASA Glenn Research Center MS 23-3, Cleveland, OH, USA,* ***Iqbal Shareef,*** *Bradley University, Peoria, IL, USA,* ***Cody Anderson,*** *Bell Helicopter, Fort Worth, TX, USA,* ***Jason Fetty,*** *U.S. Army, Aviation, Fort Eustis, VA, USA*

GEAR TOOTH BENDING FATIGUE LIFE PREDICTION USING INTEGRATED COMPUTATIONAL MATERIAL ENGINEERING
Technical Paper Publication. DETC2017-67911

Michael Oja, *VEXTEC, Brentwood, TN, USA,* ***Carlos Wink,*** *Eaton Corp., Portage, MI, USA,* ***Nikhil Deo,*** *Eaton, Pune, Maharashtra, India,* ***Robert McDaniels, Robert Tryon, Animesh Dey, Sanjeev Kulkarni,*** *VEXTEC, Brentwood, TN, USA*

A FAST FINITE ELEMENT BASED METHODOLOGY TO PREDICT THE TEMPERATURE FIELD IN A THERMOPLASTIC SPUR GEAR DRIVE
Technical Paper Publication. DETC2017-67724

Víctor Roda-Casanova, *Universitat Jaume I, Castelló De La Plana, Spain,* ***Francisco Sanchez-Marin, Alberto Porras-Vazquez,*** *Universitat Jaume I, Castellón de la Plana, Castellón, Spain*

PTG-3-5: GEAR DYNAMICS AND NOISE (5)

EXHIBIT HALL LEVEL, ROOM 15 **2:00PM–3:40PM**

Session Organizer: **Robert Parker,** *Virginia Tech, Blacksburg, VA, USA*

Session Co-Organizer: **Aiqiang Zhang,** *Chongqing University, Chongqing, China*

SIMULATION OF PLANETARY GEAR PITTING UNDER DYNAMIC CONDITIONS

Technical Paper Publication. DETC2017-68515

Murat Inalpolat, *University of Massachusetts Lowell, Lowell, MA, USA*

GEAR WHINE ANALYSIS OF AN INTEGRATED-SPRING SPLIT GEAR SYSTEM

Technical Paper Publication. DETC2017-68245

Antonino Sergio Lentini, *Siemens Industry Software, Turin, Italy,* ***Sebastian Flock,*** *SiemeSiemens Industry Software, Leuven, Belgium,* ***Yann Vonderscher,*** *VCST Industrial Products bvba, Sint-Truiden, Belgium*

STUDY THE EFFECTS FROM GEAR RIM THICKNESS ON THE GEAR PAIR TIME-VARYING MESH STIFFNESS AND DYNAMIC BEHAVIORS

Technical Paper Publication. DETC2017-68421

Zi Wang, Caichao Zhu, Chaosheng Song, *Chongqing University, Chongqing, Chongqing, China*

REDUCTION OF VIBRATION IN SPUR GEARS BY ASYMMETRIC TOOTH PROFILE WITH HIGH CONTACT RATIO

Technical Paper Publication. DETC2017-67256

Fujikwa Ryo, *Hiroshima University, Higashi-Hishoshima, Japan,* ***Kiyotaka Ikejo, Soichi Ibaraki,*** *Hiroshima University, Higashi-Hiroshima, Japan,* ***Kazuteru Nagamura,*** *Hiroshima Institute of Technology, Hiroshima, Japan*

VIB-5-1: VIBRATION AND STABILITY I

BALLROOM LEVEL, ROOM 25A **2:00PM–3:40PM**

Session Organizer: **Christopher G. Cooley,** *Southern Illinois University Carbondale, Carbondale, IL, USA*

THREE-DIMENSIONAL VIBRATION REDUCTION WITH CENTRIFUGAL PENDULUM VIBRATION ABSORBERS

Technical Presentation. DETC2017-67074

Chengzhi Shi, *University of California Berkeley, Berkeley, CA, USA,* ***Steven W. Shaw,*** *Florida Institute of Technology, Melbourne, FL, USA,* ***Robert G. Parker,*** *Virginia Tech, Blacksburg, VA, USA*

VIBRATION AND STABILITY OF A GYROSCOPIC VIBRATION ENERGY HARVESTING DEVICE

Technical Presentation. DETC2017-68323

Haohui Lu, *Southern Illinois University Carbondale, Carbondale, IL, USA,* ***Tan Chai,*** *Southern Illinois University, Carbondale, IL, USA,* ***Christopher G. Cooley,*** *Southern Illinois University Carbondale, Carbondale, IL, USA*

MODAL PROPERTIES OF CYCLICALLY SYMMETRIC SYSTEMS WITH THREE-DIMENSIONAL VIBRATING CENTRAL COMPONENTS

Technical Presentation. DETC2017-68504

Bin Dong, Robert Parker, *Virginia Tech, Blacksburg, VA, USA*

EXPERIMENTAL DETERMINATION OF DOMINANT MULTIPLIERS IN MILLING PROCESS BY MEANS OF HOMOGENEOUS COORDINATE TRANSFORMATION

Technical Paper Publication. DETC2017-67827

Adam K. Kiss, *Budapest University of Technology and Economics, Department of Applied Mechanics, Budapest, Hungary,* ***Daniel Bachrathy,*** *Budapest University of Tech & Econ, Budapest, Hungary,* ***Gabor Stepan,*** *Budapest University of Tech and Eco, Budapest, Hungary*

FABRICATION OF EXPERIMENTAL SETUP FOR INVESTIGATION OF DRILL STRING FATIGUE FAILURE

Technical Paper Publication. DETC2017-68188

Jamil Abdo, *Sultan Qaboos University, Al-Khoud, Oman,* ***Edris Hassan,*** *Sultan Qaboos University, Muscat, Oman,* ***Abdullah Al-Shabibi,*** *Sultan Qaboos University, Mescat, Oman*

VIB-9-2: SYSTEM IDENTIFICATION, DAMAGE DETECTION AND DIAGNOSTICS II

BALLROOM LEVEL, ROOM 25B **2:00PM–3:40PM**

Session Organizer: **Weidong Zhu,** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

IMPLEMENTATION OF FREQUENCY-BASED CLASSIFICATION OF DAMAGES IN COMPOSITES USING REAL-TIME FPGA-BASED HARDWARE FRAMEWORK

Technical Paper Publication. DETC2017-67508

Adauto P. A. Cunha, Sebastian F. Wirtz, *University of Duisburg-Essen, Duisburg, Germany,* ***Dirk Söffker,*** *Duisburg-Essen University, Duisburg, Germany,* ***Nejra Beganovic,*** *University of Duisburg-Essen, Duisburg, NRW, Germany*

VIBRATION OF A TAPERED ROLLER BEARING EXCITED BY LOCALIZED DAMAGE ON A ROTATING CONE RACEWAY

Technical Paper Publication. DETC2017-67566

Desheng Li, *The Timken Compay, North Canton, OH, USA*

REVIEW OF WELDING RESIDUAL STRESS STIFFENING EFFECT ON VIBRATIONAL CHARACTERISTICS OF STRUCTURES USING DAMAGE APPROACH AND VIBRATORY STRESS RELIEF IMPLEMENTATION

Technical Paper Publication. DETC2017-67993

AmirHossein MajidiRad, Yimesker Yihun, *Wichita State University, Wichita, KS, USA*

OPERATIONAL MODAL ANALYSIS OF NON-SELF-ADJOINT DYNAMIC SYSTEM

Technical Presentation. DETC2017-67392

Wei Chen, Hanwen Song, Liangliang Yu, *Tongji University, Shanghai, China*

DIRECT DETECTION OF NONLINEAR MODAL INTERACTIONS FOR MODEL UPDATING USING MEASURED TIME SERIES
Technical Presentation. DETC2017-68590

Keegan Moore, *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Mehmet Kurt,*** *Stevens Institute of Technology, Hoboken, NJ, USA,* ***Melih Eriten,*** *University of Wisconsin, Madison, WI, USA,* ***D. Michael McFarland,*** *University of Illinois, Urbana, IL, USA,* ***Lawrence Bergman,*** *University of Illinois/Urbana, Urbana, IL, USA,* ***Alexander Vakakis,*** *University of Illinois, Urbana, IL, USA*

VIB-15-2: MECHANICAL AND ACOUSTIC METAMATERIALS II

BALLROOM LEVEL, ROOM 25C **2:00PM–3:40PM**

Session Organizer: **Massimo Ruzzene,** *Georgia Institute of Tech, Atlanta, GA, USA*

Session Co-Organizer: **Chengzhi Shi,** *University of California Berkeley, Berkeley, CA, USA*

ACTIVE ACOUSTIC METAMATERIAL ESPECIALLY DESIGNED FOR MICRO-SIZE ROBOT
Technical Presentation. DETC2017-67907

Xihan Gu, Yun Chen, *Fudan University, Shanghai, Shanghai, China,* ***Xiaofeng Wu,*** *Department of Electronics Engineering, Fudan University, Shanghai, Shanghai, China,* ***Yuan Wang,*** *NSF Nano-scale Science and Engineering Center (NSEC), University of California, Berkeley, CA, USA*

ISOTROPIC TRANSFORMATION ACOUSTICS, PHONONIC STRUCTURES AND APPLICATIONS
Technical Presentation. DETC2017-67784

Andrew Norris, *Rutgers University, Piscataway, NJ, USA*

ACOUSTIC ILLUSION FOR RAPID CHANGE PROFILES WITH RESONANCE BASED METASURFACE
Technical Presentation. DETC2017-67151

Chengzhi Shi, *University of California Berkeley, Berkeley, CA, USA,* ***Marc Dubois,*** *University of California, Berkeley, Berkeley, CA, USA,* ***Yuan Wang,*** *NSF Nano-scale Science and Engineering Center (NSEC), University of California, Berkeley, CA, USA,* ***Xiang Zhang,*** *University of California, Berkeley, CA, USA*

AVT-4-1: ADVANCES IN GROUND VEHICLE SAFETY AND ERGONOMICS

EXHIBIT HALL LEVEL, ROOM 24 **4:00PM–5:40PM**

Session Organizer: **Costin Untaroiu,** *Virginia Tech, Blacksburg, VA, USA*

Session Co-Organizers: **Alan Mayton,** *CDC/NIOSH/Pittsburgh Mining Research Division, Pittsburgh, PA, USA,* **James Yang,** *Texas Tech, Lubbock, TX, USA*

EXAMINATION OF VIBRATION EXPOSURES FOR HAUL TRUCK OPERATORS EMPLOYED AT U.S. SURFACE MINES/QUARRIES WITH A VIEW TOWARD HAUL TRUCK ACTIVITY
Technical Presentation. DETC2017-68461

Alan Mayton, *CDC/NIOSH/Pittsburgh Mining Research Division, Pittsburgh, PA, USA,* ***William Porter,*** *PMRD/NIOSH/CDC, Pittsburgh, PA, USA,* ***Xueyan S. Xu,*** *CDC/NIOSH/HELD, Morgantown, WV, USA*

HUMAN FINITE ELEMENT MODELS FOR SIMULATING PEDESTRIAN ACCIDENTS
Technical Presentation. DETC2017-68468

Costin Untaroiu, Wansoo Pak, Yunzhu Meng, *Virginia Tech, Blacksburg, VA, USA*

KINEMATIC COLLISION RESPONSES OF DIFFERENT LEGFORM IMPACTOR SUBSYSTEM
Technical Presentation. DETC2017-68538

Obaidur rahman Mohammed, Shabbir Memon, *Wichita State University, Wichita, KS, USA,* ***Hamid Lankarani,*** *Wichita State University, Wichita, KS, USA*

ECONOMIC DRIVING STRATEGY FOR COMMERCIAL VEHICLES IN MOUNTAINOUS AREAS
Technical Paper Publication. DETC2017-68378

Xianyao Ping, Jialiang Liu, Zilin Lu, Yuxin Pang, Yahui Wu, Renjie Zhou, Chenyu Wang, *Wuhan University of Technology, Wuhan, China,* ***Gangfeng Tan,*** *Wuhan University of Technology & Virginia Polytechnic Institute and State University,* ***Lei Zuo,*** *Virginia Tech, Blacksburg, VA, USA*

DAC-2-1: ACTIVE SYSTEM DESIGN

CONCOURSE LEVEL, ROOM 7 **4:00PM–5:40PM**

Session Organizer: **James Allison,** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

Session Co-Organizer: **Krishna Vijayaraghavan,** *Simon Fraser University, Surrey, BC, Canada*

A DECENTRALIZED APPROACH FOR MULTI-SUBSYSTEM CO-DESIGN OPTIMIZATION USING DIRECT COLLOCATION METHOD
Technical Paper Publication. DETC2017-67906

Tianchen Liu, Shapour Azarm, *University of Maryland, College Park, College Park, MD, USA,* ***Nikhil Chopra,*** *University of Maryland at College Park, College Park, MD, USA*

DESIGN OF A RECONFIGURABLE DYNAMIC TESTBED FOR CO-DESIGN METHOD VALIDATION

Technical Paper Publication. DETC2017-67319

Anand Deshmukh, *University of Illinois at Urbana Champaign, Urbana, IL, USA,* ***Danny Lohan,*** *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

NESTED AND SIMULTANEOUS SOLUTION STRATEGIES FOR GENERAL COMBINED PLANT AND CONTROLLER DESIGN PROBLEMS

Technical Paper Publication. DETC2017-67668

Daniel Herber, *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

UNIFIED SCALING OF DYNAMIC OPTIMIZATION DESIGN FORMULATIONS

Technical Paper Publication. DETC2017-67676

Daniel Herber, *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

OPTIMAL SENSOR PLACEMENT METHODS FOR ACTIVE POWER ELECTRONIC SYSTEMS

Technical Paper Publication. DETC2017-68253

Satya R T Peddada, *University of Illinois at Urbana Champaign, Urbana, IL, USA,* ***Pamela Tannous,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***Andrew G. Alleyne,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

DAC-6-2: DESIGN FOR ADDITIVE MANUFACTURING 2

CONCOURSE LEVEL, ROOM 8 **4:00PM–5:40PM**

Session Organizer: **Timothy Simpson,** *Pennsylvania State University, University Park, PA, USA*

Session Co-Organizer: **Georges Fadel,** *Clemson University, Clemson, SC, USA*

COST MINIMIZATION IN METAL ADDITIVE MANUFACTURING USING CONCURRENT STRUCTURE AND PROCESS OPTIMIZATION

Technical Paper Publication. DETC2017-67836

Runze Huang, Erva Ulu, *Carnegie Mellon University, Pittsburgh, PA, USA,* ***Levent Kara,*** *Carnegie Mellon University, Pittsburgh, PA, USA,* ***Kate S. Whitefoot,*** *Carnegie Mellon University, Pittsburgh, PA, USA*

OPTIMIZATION OF LATTICE INFILL DISTRIBUTION IN ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-67582

Francesco Campagna, *Politecnico di Torino, Torino, Italy,* ***Alejandro R. Diaz,*** *Michigan State University, East Lansing, MI, USA*

DESIGN AND FABRICATION OF 3D PRINTED TISSUE SCAFFOLDS INFORMED BY MECHANICS AND FLUIDS SIMULATIONS

Technical Paper Publication. DETC2017-67602

Paul Egan, Veronica Gonella, Max Engensperger, Stephen J Ferguson, Kristina Shea, *Swiss Federal Institute of Technology ETH Zurich, Zurich, Switzerland*

TOPOLOGY OPTIMIZATION FOR ADDITIVE MANUFACTURING CONSIDERING LAYER-BASED MINIMUM FEATURE SIZES

Technical Paper Publication. DETC2017-68383

Mikhail Osanov, *Johns Hopkins University, Baltimore, MD, USA,* ***James Guest,*** *Johns Hopkins University, Lutherville Timonium, MD, USA*

EXPEDITING BUILD TIME, MATERIAL, AND COST ESTIMATION FOR MATERIAL EXTRUSION PROCESSES TO ENABLE MOBILE APPLICATIONS

Technical Paper Publication. DETC2017-68230

Shantanab Dinda, *The Pennsylvania State University, State College, PA, USA,* ***Devansh Modi, Timothy W. Simpson,*** *Penn State University, University Park, PA, USA,* ***Saish Tedia, Christopher Williams,*** *Virginia Tech, Blacksburg, VA, USA*

DAC-7-1: DESIGN FOR MARKET SYSTEMS

CONCOURSE LEVEL, ROOM 6 **4:00PM–5:40PM**

Session Organizer: **Scott Ferguson,** *North Carolina State University, North Carolina, NC, USA*

Session Co-Organizer: **Kenneth Mark Bryden,** *Iowa State University, Ames, IA, USA*

DESIGN FOR MARKETING MIX: THE PAST, PRESENT, AND FUTURE OF MARKET-DRIVEN PRODUCT DESIGN

Technical Paper Publication. DETC2017-68275

Joseph Donndelinger, *Baylor University, Waco, TX, USA,* ***Scott Ferguson,*** *North Carolina State University, North Carolina, NC, USA*

TWO-STAGE MODELING OF CUSTOMER CHOICE PREFERENCES IN ENGINEERING DESIGN USING BIPARTITE NETWORK ANALYSIS

Technical Paper Publication. DETC2017-68099

Jiawei Sophia Fu, *Northwestern University, Evanston, IL, USA,* ***Zhenghui Sha,*** *University of Arkansas, Fayetteville, AR, USA,* ***Yun Huang,*** *Northwestern University, Evanston, IL, USA,* ***Mingxian Wang,*** *Ford Motor Company, Dearborn, MI, USA,* ***Yan Fu,*** *Ford Motor Company, Bloomfield Hills, MI, USA,* ***Wei Chen,*** *Northwestern University, Evanston, IL, USA*

AGENT BASED MODELING OF AUTOMOBILE PRODUCER AND CONSUMER BEHAVIOR TO SUPPORT DESIGN FOR MARKET SYSTEMS ANALYSIS

Technical Paper Publication. DETC2017-68351

Amineh Zadbood, Steven Hoffenson, *Stevens Institute of Technology, Hoboken, NJ, USA*

DESIGN FOR REPAIR: A GAME BETWEEN MANUFACTURER AND INDEPENDENT REPAIR SERVICE PROVIDER
Technical Paper Publication. DETC2017-67986

Mostafa Sabbaghi, *University at Buffalo, Buffalo, NY, USA,* ***Sara Behdad,*** *University at Buffalo, SUNY, New York, United Kingdom*

RELIABILITY-BASED DESIGN OPTIMIZATION (RBDO) FOR ELECTRIC VEHICLE MARKET SYSTEMS
Technical Paper Publication. DETC2017-68045

Ungki Lee, Namwoo Kang, Ikjin Lee, *KAIST, Daejeon, Korea (Republic)*

DTM-11-2: DESIGN OF COMPLEX SYSTEMS II

EXHIBIT HALL LEVEL, ROOM 20 **4:00PM–5:40PM**

Session Organizer: **Robert Stone,** *Oregon State University, Corvallis, OR, USA*

Session Co-Organizer: **Deborah Thurston,** *University of Illinois at Urbana-Champaign, Chicago, CA, USA*

A SURVEY: TOWARDS UNDERSTANDING EMERGENT BEHAVIOR IN COMPLEX ENGINEERED SYSTEMS
Technical Paper Publication. DETC2017-67453

Nicolas F Soria Zurita, *Oregon State University, Corvallis, OR, USA,* ***Irem Tumer,*** *Dept. of Mechanical Engineering, Corvallis, OR, USA*

ONTOLOGIES TO SUPPORT CUSTOMER REQUIREMENT FORMULATION IN AEROSPACE DESIGN
Technical Paper Publication. DETC2017-67701

Mark Lemke, Robert Stone, Ryan Arlitt, *Oregon State University, Corvallis, OR, USA*

PRODUCT PERFORMANCE EVOLUTION PREDICTION BY LOTKA-VOLTERRA EQUATIONS
Technical Paper Publication. DETC2017-67369

Guanglu Zhang, Professor Daniel McAdams, Milad Mohammadi Darani, Venkatesh Shankar, *Texas A&M University, College Station, TX, USA*

IDENTIFYING AND MANAGING DILEMMAS FOR SUSTAINABLE DEVELOPMENT OF RURAL INDIA
Technical Paper Publication. DETC2017-67592

Abhishek Yadav, *The University of Oklahoma, Norman, OK, USA,* ***Ashok Das,*** *SunMoksha Power Pvt Limited, Bengaluru, Karnataka, India,* ***Ram Babu Roy,*** *Indian Institutes of Technology, Kharagpur, Kharagpur, India,* ***Archana Chatterjee,*** *International Union for the Conservation of Nature, New Delhi, India,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

CONCEPTUAL DESIGN METHOD DRIVEN BY PRODUCT GENES
Technical Paper Publication. DETC2017-68224

Pan Li, Yan Yan, Guoxin Wang, *Beijing Institute of Technology, Beijing, China*

MR-2-1: ROBOTIC SYSTEMS

EXHIBIT HALL LEVEL, ROOM 11 **4:00PM–5:40PM**

Session Organizer: **Qiaode Jeffrey Ge,** *Stony Brook University, Stony Brook, NY, USA*

Session Co-Organizer: **David Myszka,** *University of Dayton, Dayton, OH, USA*

OPTIMAL PATHS FOR POLYGONAL ROBOTS IN SE(2)
Technical Paper Publication. DETC2017-67881

Monroe Kennedy III, Dinesh Thakur, *University of Pennsylvania, Philadelphia, PA, USA,* ***M. Ani Hsieh,*** *Drexel University, Philadelphia, PA, USA,* ***Subhrajit Bhattacharya,*** *Lehigh University, Bethlehem, PA, USA,* ***Vijay Kumar,*** *University of Pennsylvania, Philadelphia, PA, USA*

POSE CHANGES FROM A DIFFERENT POINT OF VIEW
Technical Paper Publication. DETC2017-67725

Gregory S. Chirikjian, *Johns Hopkins University, Baltimore, MD, USA,* ***Robert Mahony,*** *Australian National University, Canberra, ACT, Australia,* ***Sipu Ruan,*** *Johns Hopkins University, Baltimore, MD, USA,* ***Jochen Trumpf,*** *Australian National University, Canberra, ACT, Australia*

UNDERSTANDING POWER LOSS DUE TO MECHANICAL ANTAGONISM AND A NEW POWER OPTIMAL PSUEDOINVERSE FOR REDUNDANT ACTUATORS
Technical Paper Publication. DETC2017-67942

Nathan Cahill, *Arizona State University, Gilbert, AZ, USA,* ***Kyle A. Schroeder,*** *SpringActive.inc, Tempe, AZ, USA,* ***Thomas Sugar,*** *Arizona State University, Tempe, AZ, USA,* ***Matthew Holgate,*** *SpringActive.inc, Tempe, AZ, USA*

A STUDY ON FINDING FINITE ROOTS FOR KINEMATIC SYNTHESIS
Technical Paper Publication. DETC2017-68341

Mark Plecnik, *University of California, Berkeley, Berkeley, CA, USA,* ***Ronald Fearing,*** *of California, Berkeley, CA, USA*

ENERGY-EFFICIENT TRAJECTORY PLANNING FOR ROBOT MANIPULATORS
Technical Paper Publication. DETC2017-67198

Michael Lorenz, *Department of Mechanism Theory and Dynamics of Machines, RWTH Aachen University, Aachen, Germany,* ***Jascha Paris, Frédéric Schöler, Juan-Pablo Barreto, Tom Mannheim,*** *Department of Mechanism Theory and Dynamics of Machines, RWTH Aachen Univers, RWTH Aachen University, Aachen, Germany,* ***Mathias Hüsing, Burkhard Corves,*** *Department of Mechanism Theory and Dynamics of Machines of RWTH Aachen University, Aachen, Germany*

MR-4-8: ACTUATION & DEPLOYMENT

EXHIBIT HALL LEVEL, ROOM 9 **4:00PM–5:40PM**

Session Organizer: **Yves Klett,** *Institute of Aircraft Design Uni Stuttgart, Stuttgart, Germany*

Session Co-Organizer: **Sameh Tawfick,** *University of Illinois, Urbana, IL, USA*

A FRAMEWORK FOR THE DESIGN AND OPTIMIZATION OF SELF-FOLDING STRUCTURES
Technical Paper Publication. DETC2017-68203

Landen Bowen, *The Pennsylvania State University, University Park, PA, USA,* ***Mary Frecker,*** *Pennsylvania State University, University Park, PA, USA,* ***Timothy Simpson,*** *Pennsylvania State University, University Park, PA, USA,* ***Rebecca Strzelec,*** *Penn State University, Altoona, PA, USA*

DISCOVERING ORIGAMI FOLD PATTERNS WITH OPTIMAL ACTUATION THROUGH NONLINEAR MECHANICS ANALYSIS
Technical Paper Publication. DETC2017-67927

Andrew Gillman, *UES, Inc. / Air Force Research Laboratory, Dayton, OH, USA,* ***Kazuko Fuchi,*** *University of Dayton, Dayton, OH, OH, USA,* ***Giorgio Bazzan,*** *UES, Inc. / Air Force Research Laboratory, Wright-Patterson AFB, OH, USA,* ***Edward J. Alyanak,*** *Air Force Research Laboratory, Wright-Patterson AFB, OH, USA,* ***Philip Buskohl,*** *Air Force Research Laboratory, Wright Patterson AFB, OH, USA*

OPTIMIZATION OF ORIGAMI-BASED TUBES FOR LIGHTWEIGHT DEPLOYABLE STRUCTURES
Technical Paper Publication. DETC2017-67274

Alden Yellowhorse, Kyler Tolman, *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

DYNAMIC MODELING AND ANALYSIS OF STRAIN ENERGY AND CENTRIFUGAL FORCE DEPLOYMENT OF AN ORIGAMI FLASHER
Technical Paper Publication. DETC2017-68419

Md Emran Hossain Bhuiyan, Daniel Semer, *University of Toledo, Toledo, OH, USA,* ***Brian Trease,*** *The University of Toledo, Toledo, OH, USA*

MR-7-3: SURGICAL APPLICATIONS

EXHIBIT HALL LEVEL, ROOM 10 **4:00PM–5:40PM**

Session Organizer: **Carl Nelson,** *University of Nebraska, Lincoln, NE, USA*

Session Co-Organizer: **Chin-Hsing Kuo,** *National Taiwan University of Science and Technology, Taipei, Taiwan*

DESIGN OF A MANIPULATION MODULE FOR NEEDLESCOPIC SURGERY
Technical Paper Publication. DETC2017-67121

Mohammad Aamir Khan, *The University of Lahore, Punjab, Pakistan,* ***Matteo Zoppi,*** *University of Genova, Italy,* ***Rezia Molfino,*** *University of Genova, Italy*

MOTOR SKILL EVALUATION DURING ROBOT-ASSISTED SURGERY
Technical Paper Publication. DETC2017-67607

Somayeh B. Shafiei, Lora Cavuoto, *University at Buffalo, SUNY, Buffalo, NY, USA,* ***Khurshid A. Guru,*** *Roswell Park Cancer Institute, Buffalo, NY, USA*

USE OF NUMERICAL-CLUSTERING FRAMEWORK FOR END-EFFECTOR TRACKING DURING ROBOT-ASSISTED SURGERY
Technical Paper Publication. DETC2017-67616

Somayeh B. Shafiei, *University at Buffalo, SUNY, Buffalo, NY, USA,* ***Khurshid A. Guru,*** *Roswell Park Cancer Institute, Buffalo, NY, USA*

POSTURAL BALANCE OF AN UNDERACTUATED BIPED ROBOT WITH A REACTION WHEEL
Technical Paper Publication. DETC2017-67351

Christopher Maurice, James Schmiedeler, Bill Goodwine, *University of Notre Dame, Notre Dame, IN, USA*

MNS-2-2: NONLINEAR RESONATORS

[Cross-listed with VIB-12]

EXHIBIT HALL LEVEL, ROOM 13 **4:00PM–5:40PM**

Session Organizer: **Fadi Alsaleem,** *University of Nebraska – Lincoln, Omaha, NE, USA*

Session Co-Organizer: **Slava Krylov,** *Tel Aviv University, Tel Aviv, Israel*

ON THE EFFECTS OF TEMPERATURE AND RELATIVE HUMIDITY ON THE RESPONSE OF A MEMS ARCH RESONATOR
Technical Paper Publication. DETC2017-68241

Mohammad Hasan, *University of Nebraska–Lincoln, Omaha, NE, USA,* ***Hassen Ouakad,*** *King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia,* ***Fadi Alsaleem,*** *University of Nebraska–Lincoln, Omaha, NE, USA*

SMART RESONANT GAS SENSOR AND SWITCH OPERATING IN AIR WITH METAL ORGANIC FRAMEWORKS COATING
Technical Paper Publication. DETC2017-67823

Nizar R. Jaber, Saad Ilyas, *King Abdullah University of Science & Technology, Thuwal, Saudi Arabia,* ***Osama Shekhah, Mohamed Eddaoudi,*** *King Abdullah University of Science and Technology, Thuwal, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

MODELING AND ANALYSIS OF MICROFABRICATED BULK PIEZOELECTRIC DISC TRANSFORMERS
Technical Paper Publication. DETC2017-68027

Oliver Barham, *University of Maryland, Washington, DC, USA,* ***Don DeVoe,*** *University of Maryland, College Park, MD, USA*

SUBHARMONIC AND COMBINATION RESONANCES OF A GEOMETRICALLY NONLINEAR MICROCANTILEVER-POLYMER SYSTEM
Technical Presentation. DETC2017-68529

Keivan Asadi, *The Ohio State University, Columbus, OH, USA,* ***Snehan Peshin, Junghoon Yeom,*** *Michigan State University, East Lansing, MI, USA,* ***Hanna Cho,*** *The Ohio State University, Columbus, OH, USA*

APPLICATION OF NONLINEAR ACTIVE DISTURBANCE REJECTION CONTROL TO ONE DOF ELECTROSTATIC ACTUATORS
Technical Paper Publication. DETC2017-67190

Prasanth Kandula, Lili Dong, *Cleveland State University, Cleveland, OH, USA*

PTG-2-3: GEAR ANALYSIS, MATERIALS, FATIGUE (3)

EXHIBIT HALL LEVEL, ROOM 16 **4:00PM–5:40PM**

Session Organizer: **Sheng Li,** *Wright State University, Dayton, OH, USA*

Session Co-Organizer: **Philipp Roth,** *Technical University of Munich, Germany*

DIFFERENTIAL GEAR BENDING STRESSES IN PRESENCE OF MISALIGNMENTS AND RUNOUT
Technical Paper Publication. DETC2017-67191

Mohsen Kolivand, *American Axle and Manufacturing Inc., Detroit, MI, USA,* ***Victor Sun, Douglas Chemelli, Joe Balenda, Zhenghong Shi,*** *American Axle & Manufacturing Inc., Detroit, MI, USA*

CALCULATION ON GEAR PAIRS CONTACT STRESS IN LOADED CONDITION BY THEORETICAL ANALYSIS AND NUMERICAL SIMULATION
Technical Presentation. DETC2017-68525

Kai Xu, *Henan University of Science and Technology, Luoyang, China*

ANALYSIS OF COMPLIANT GEAR PAIRS WITH PROFILE MODIFICATIONS
Technical Presentation. DETC2017-68493

Xiaoqi Li, Robert Parker, *Virginia Tech, Blacksburg, VA, USA*

AN ORDER ANALYSIS BASED SECOND-ORDER CYCLIC FUNCTION TECHNIQUE FOR PLANETARY GEAR FAULT DETECTION UNDER NON-STATIONARY OPERATING CONDITIONS
Technical Presentation. DETC2017-68543

Mian Zhang, *University of Electronic Science and Technology of China, Chengdu, China,* ***Kesheng Wang,*** *University of Electronic Science and Technology of China, Chengdu, China,* ***Dongdong Wei,*** *University of Electronic Science and Technology of China, Cheng Du, China*

CONICAL MULTIRECESS HYDROSTATIC / HYBRID JOURNAL BEARING UNDER MICROPOLAR LUBRICATION FOR DIFFERENT LOAD ARRANGEMENTS
Technical Presentation. DETC2017-67040

Satyam Shivam Gautam, Narendra Kumar Rana, *North Eastern Regional Institute of Science and Technology, Itanagar, India,* ***Suresh Verma,*** *Deenbandhu Chhotu Ram University of Science and Technology, Sonepat, India*

PTG-3-6: GEAR DYNAMICS AND NOISE (6)

EXHIBIT HALL LEVEL, ROOM 15 **4:00PM–5:40PM**

Session Organizer: **Yimin Shao,** *Chongqing University, Chongqing, China*

Session Co-Organizer: **Brian Anichowski, Jr.,** *The Ohio State University, Columbus, OH, USA*

A STUDY ON EFFECT OF FLEXIBLE PIN ON LOAD SHARING CHARACTERISTICS OF HERRINGBONE STAR GEAR TRANSMISSION SYSTEM
Technical Presentation. DETC2017-68548

Jing Wei, Panwu Yang, *Chongqing University, Chongqing, China,* ***Datong Qin,*** *Chongqing University, Chongqing, China,* ***Aiqiang Zhang, Peixin Bai,*** *Chongqing University, Chongqing, China,* ***Teik Lim,*** *The University of Texas at Arlington, Fort Worth, TX, USA*

EFFECT OF TRACK GEOMETRIC IRREGULARITY ON DYNAMIC CHARACTERISTICS OF GEAR TRANSMISSION IN A LOCOMOTIVE
Technical Paper Publication. DETC2017-67034

Tao Zhang, Zaigang Chen, Jie Zhang, Shunqi Sui, Cheng Pan, *Southwest Jiaotong University, Chengdu, Sichuan, China*

VIB-5-2: VIBRATION AND STABILITY II

BALLROOM LEVEL, ROOM 25A **4:00PM–5:40PM**

Session Organizer: **Christopher G. Cooley,** *Southern Illinois University Carbondale, Carbondale, IL, USA*

INVESTIGATION OF NOISE FEATURES OF PLANETARY GEAR TRAINS BASED ON HUMAN AURAL CHARACTERISTIC
Technical Paper Publication. DETC2017-67626

Masao Nakagawa, Dai Nishida, Deepak Sah, Toshiki Hirogaki, Eiichi Aoyama, *Doshisha University, Kyotanabe, Japan*

THE SPATIAL AND TEMPORAL HARMONIC BALANCE METHOD FOR OBTAINING PERIODIC RESPONSES OF A NONLINEAR PARTIAL DIFFERENTIAL EQUATION WITH A LINEAR COMPLEX BOUNDARY CONDITION
Technical Paper Publication. DETC2017-67792

Xuefeng Wang, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Weidong Zhu,*** *University of Maryland, Baltimore Ct, Baltimore, MD, USA*

A THEORETICAL INVESTIGATION OF THE EFFECT OF THE STOCHASTICITY IN THE MATERIAL PROPERTIES ON THE CHATTER DETECTION DURING TURNING
Technical Paper Publication. DETC2017-67900

Henrik T. Sykora, *Budapest University of Technology and Economics, Budapest, Hungary,* ***Daniel Bachrathy,*** *Budapest University of Tech & Econ, Budapest, Hungary,* ***Gabor Stepan,*** *Budapest University of Tech and Eco, Budapest, Hungary*

VIB-15-3: MECHANICAL AND ACOUSTIC METAMATERIALS III

BALLROOM LEVEL, ROOM 25C **4:00PM–5:40PM**

Session Organizer: **Chengzhi Shi,** *University of California Berkeley, Berkeley, CA, USA*

Session Co-Organizer: **Ryan L. Harne,** *The Ohio State University, Columbus, OH, USA*

BANDGAP ESTIMATION IN LOCALLY RESONANT MECHANICAL AND ELECTROMECHANICAL METASTRUCTURES
Technical Presentation. DETC2017-68516

Christopher Sugino, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Massimo Ruzzene,*** *Georgia Institute of Tech, Atlanta, GA, USA,* ***Alper Erturk,*** *Georgia Institute of Technology, Atlanta, GA, USA*

TOPOLOGICAL ACOUSTICS
Technical Presentation. DETC2017-67611

Pierre Deymier, *University of Arizona, Tucson, AZ, USA,* ***Keith Runge,*** *Dept. of Materials Science and Engr., Tucson, AZ, USA*

TUNABLE SHOCK MITIGATION IN LIGHTWEIGHT MECHANICAL METAMATERIALS USING CRITICAL POINT CONSTRAINTS
Technical Presentation. DETC2017-68481

Shichao Cui, Sansriti Saxena, Ryan L Harne, *The Ohio State University, Columbus, OH, USA*

PERIODIC STRUCTURES WITH NONLINEAR RESONATORS: BROADBAND ATTENUATION AND CHAOS
Technical Presentation. DETC2017-68478

Yiwei Xia, Alper Erturk, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Massimo Ruzzene,*** *Georgia Institute of Tech, Atlanta, GA, USA*

CIE-26-1: GRADUATE STUDENT POSTER SESSION

BALLROOM LEVEL, BALLROOM FOYER **4:00PM–6:00PM**

Session Organizer: **Yayue Pan,** *University of Illinois at Chicago, Chicago, IL, USA*

CORRELATION BETWEEN MICRO-SCALE PARTICLE DISTRIBUTION IN 3D PRINTING AND MACROSCOPIC COMPOSITE PERFORMANCE
Poster Presentation.

Erina Baynojir, *University of Illinois at Chicago*

EFFECT OF HUMAN HIP AND ANKLE SENSORY-MOTOR TIME DELAYS ON BALANCE STABILITY
Poster Presentation.

Erik Chumacero-Polanco, *Texas Tech University*

DESIGN TOWARDS ADDITIVE MANUFACTURING CHARACTERIZATION WITH 6-DOF TEST FRAME
Poster Presentation.

Sean Fry, *Clemson University*

TOWARDS A REUSE-CENTRIC COMPUTATIONAL PARADIGM FOR MASS CUSTOMIZATION IN ADDITIVE MANUFACTURING
Poster Presentation.

Jida Huang, *University at Buffalo*

SURROGATE BASED OPTIMIZATION OF NANOPARTICLE-EMBEDDED THIN FILM ORGANIC SOLAR CELLS
Poster Presentation.

Mine Kaya, *Texas A&M University*

CITYPLOT-VR: IMPLEMENTING VIRTUAL REALITY FOR DESIGN DECISION TO TRADEOFF VISUALIZATION
Poster Presentation.

Nathan Knerr, *Cornell University*

TITLE NOT AVAILABLE AT PRESS TIME
Poster Presentation.

Hemanth Manjunatha, *University at Buffalo*

OPTIMAL ROUTES FOR CABLES, HARNESSES, AND HOSES IN AUTOMOTIVE SYSTEMS
Poster Presentation.

Nafiseh Masoudi, *Clemson University*

INFORMATION MODELING FRAMEWORK FOR CAD AND ADDITIVE MANUFACTURING PROCESS RELATIONSHIPS
Poster Presentation.

Shreyas Patil, *University of Massachusetts Amherst*

A SEMANTIC TEXT ANALYTICS TECHNIQUE FOR CAPABILITY-BASED CLASSIFICATION OF MANUFACTURING SUPPLIERS
Poster Presentation.

Ramin Sabbagh, *Texas State University*

COLLABORATIVE ROBOT EXPLORATION AND DECISION MAKING USING NURBS BASED SURROGATE MODELS
Poster Presentation.

By Alice Stevens, *Clemson University*

ENABLING THE SYNTHESIS, ASSESSMENT AND SELECTION OF NEW DESIGNS BY THE COMPOSITION FROM A LIBRARY OF MODELS
Poster Presentation.

Joshua Sutherland, *University of Tokyo*

TITLE NOT AVAILABLE AT PRESS TIME
Poster Presentation.

Florian Van Den Corput, *Delft University of Technology*

TECHNICAL SESSIONS AT-A-GLANCE

— WEDNESDAY —

Room	8:00am – 9:40am	10:00am – 11:40am	1:15pm – 2:55pm	3:15pm – 4:15pm
Room 1 *Concourse Level*		**INDUSTRY ***		
Room 3 *Concourse Level*	CIE-14-1			
Room 4 *Concourse Level*	CIE-6-4	CIE-10-1	CIE-10-2	
Room 5 *Concourse Level*	CIE-12-1	CIE-16-1	CIE-16-2	
Room 6 *Concourse Level*	DAC-4-1	DAC-14-1		
Room 7 *Concourse Level*	DAC-19-3	DAC-11-3		
Room 8 *Exhibit Level*				
Room 9 *Exhibit Level*	MR-3-1		MR-1-5	
Room 10 *Exhibit Level*		MR-6-2	MR-6-3	MSNDC-16-1
Room 11 *Exhibit Level*	MR-2-2	MR-2-3	MR-2-4	
Room 12 *Exhibit Level*				
Room 13 *Exhibit Level*	MNS-4-1	MNS-2-3	MNS-2-4	VIB-12-1
Room 14 *Exhibit Level*	MESA-3-1			
Room 15 *Exhibit Level*	PTG-4-1	PTG-4-2	PTG-8-1	PTG-8-2
Room 16 *Exhibit Level*	PTG-6-1	PTG-6-2	PTG-5-1	PTG-5-2
Room 19 *Exhibit Level*	MESA-22-3			
Room 20 *Exhibit Level*	DTM-12-1	DTM-1-3	DTM-14-1	
Room 21 *Exhibit Level*	**DFMLC-12-1 ***		DFMLC-6-1	
Room 22 *Exhibit Level*	MNS-7-1	MNS-3-1	DFMLC-10-1	
Room 23 *Exhibit Level*		DEC-3-1		
Room 24 *Exhibit Level*	AVT-5-1	AVT-6-1		
Room 25A *Ballroom Level*	VIB-8-1	MSNDC-7-1	VIB-8-2	VIB-8-3
Room 25B *Ballroom Level*	MSNDC-5-4	VIB-4-2		VIB-11-1
Room 25C *Ballroom Level*		MR-3-2	MSNDC-9-1	VIB-14-1
Room 26A *Ballroom Level*			MSNDC-8-1	MSNDC-8-2
Room 26B *Ballroom Level*		MSNDC-1-1	MSNDC-12-1	MSNDC-14-1
Room 26C *Ballroom Level*	MSNDC-3-1	MSNDC-3-2	MSNDC-3-3	

WEDNESDAY, AUGUST 9, 2017

AVT-5-1: ADVANCES IN VEHICLE ELECTRIFICATION AND POWERTRAIN DESIGN

EXHIBIT HALL LEVEL, ROOM 24 **8:00AM–9:40AM**

Session Organizer: **Joel Anstrom,** *Penn State University, University Park, PA, USA*

Session Co-Organizers: **Martin Hosek,** *Persimmon Technologies Corporation, Wakefield, MA, USA,* **Madhu Raghavan,** *General Motors R&D Center, West Bloomfield, MI, USA*

EXTENDING THE CAPABILITIES OF ELECTRIFIED PROPULSION SYSTEMS

Technical Paper Publication. DETC2017-68234

Madhu Raghavan, *General Motors R&D Center, West Bloomfield, MI, USA,* ***V. Prasad Atluri,*** *General Motors R&D, Pontiac, MI, USA*

CLOSED-LOOP DESIGN FOR HYBRID POWERTRAINS

Technical Paper Publication. DETC2017-67404

Johan Vanhuyse, *Siemens Industry Software NV, Leuven, Belgium,* ***Nikolce Murgovski,*** *Chalmers University of Technology, Gothenburg, Sweden,* ***Mike Nicolai,*** *Siemens Industry Software NV, Leuven, Belgium,* ***Herman Van der Auweraer,*** *Siemens Industry Software NV, Leuven, Belgium,* ***Wim Desmet,*** *KU Leuven, Leuven, Belgium*

REALTIME POWER MANAGEMENT OF A MULTI-SOURCE HEV USING ADAPTIVE DYNAMIC PROGRAMMING AND PROBABILISTIC DRIVE STATE MODEL

Technical Paper Publication. DETC2017-67568

Ahmed M. Ali, *University of Duisburg-Essen, Duisburg, Germany,* ***Dirk Söffker,*** *Duisburg-Essen University, Duisburg, Germany*

COOPERATIVE BRAKE CONTROL STRATEGY FOR ELECTRIC VEHICLE EQUIPPED WITH A TWO-SPEED UNINTERRUPTED MECHANICAL TRANSMISSION

Technical Paper Publication. DETC2017-68201

Yuzhuo Tai, Tsinghua, *Beijing, China,* ***Jian Song, Liangyao Yu, Shengnan Fang, Truong Sinh Nguyen,*** *Tsinghua University, Beijing, China*

SMART MULTI-MODE TRANSMISSION FOR AUTOMOBILES

Technical Paper Publication. DETC2017-67019

Nitin Srinath, *National Institute of Technology Karnataka, Bangalore, Karnataka, India,* ***Ashwin Kumar GV, Sharnappa Joladarashi,*** *National Institute of Technology Karnataka, Mangalore, Karnataka, India*

CIE-6-4: AMS/SEIKM/CAPPD: DESIGN, SIMULATION AND OPTIMIZATION FOR ADDITIVE MANUFACTURING IV

CONCOURSE LEVEL, ROOM 4 **8:00AM–9:40AM**

Session Organizer: **Yan Lu,** *NIST, Gaithersburg, MD, USA*

LINEAR TIME THERMAL SIMULATION OF FDM PROCESS

Technical Paper Publication. DETC2017-68293

Yaqi Zhang, *University of Wisconsin, Madison, WI, USA,* ***Vadim Shapiro,*** *University of Wisconsin, Madison, WI, USA*

DEVELOPMENT AND PERFORMANCE ASSESSMENT OF A CAD-INTEGRATED COST ESTIMATOR TO SUPPORT DESIGN FOR ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-68330

Andrew Armstrong, *USCGA, New London, CT, USA,* ***Michael Barclift,*** *Penn State University, State College, PA, USA,* ***Timothy W. Simpson,*** *Penn State University, University Park, PA, USA*

A COLLABORATIVE DATA MANAGEMENT SYSTEM FOR ADDITIVE MANUFACTURING

Technical Paper Publication. DETC2017-68457

Yan Lu, Paul Witherell, Alkan Donmez, *NIST, Gaithersburg, MD, USA*

THE POWER OF FUNCTIONAL GENERATIVE DESIGN THROUGH ADVANCED GEOMETRY OPTIMIZATION

Technical Presentation. DETC2017-68143

Jesse Coors-Blankenship, *Frustum, Boulder, CO, USA*

TOWARDS COMPUTATIONAL SYNTHESIS OF MICROSTRUCTURAL CRYSTALLINE MORPHOLOGIES FOR ADDITIVE MANUFACTURING APPLICATIONS

Technical Paper Publication. DETC2017-68149

John Michopoulos, *Naval Research Laboratory, Washington, DC, USA,* ***Athanasios Iliopoulos,*** *US Naval Research Laboratory, Washington, DC, USA,* ***John Steuben,*** *U.S. Naval Research Laboratory, Glenwood Springs, CO, USA,* ***Andrew J. Birnbaum,*** *US Naval Research Laboratory, Washington, DC, USA,* ***Yao Fu,*** *University of Cincinnati, Cincinnati, OH, USA,* ***Jeong-Hoon Song,*** *University of Colorado at Boulder, Boulder, CO, USA*

CIE-12-1: SEIKM GENERAL

CONCOURSE LEVEL, ROOM 5 **8:00AM–9:40AM**

Session Organizer: **Ashis Banerjee,** *University of Washington, Seattle, WA, USA*

Session Co-Organizer: **Christopher Hoyle,** *Oregon State University, Corvallis, OR, USA*

A FRAMEWORK FOR AUTOMATED MODEL INTERFACE COORDINATION USING SYSML

Technical Paper Publication. DETC2017-67273

William Bailey, Judy Che, Poyu Tsou, *Ford Motor Company, Dearborn, MI, USA,* ***Mark Jennings,*** *Ford Motor Company, Saline, MI, USA*

UTILIZING NODE INTERFERENCE METHOD AND COMPLEX NETWORK CENTRALITY METRICS TO EXPLORE REQUIREMENT CHANGE PROPAGATION

Technical Paper Publication. DETC2017-67930

Phyo Htet Hein, *Florida Institute of Technology, Melbourne, FL, USA,* ***Beshoy Morkos, Chiradeep Sen,*** *Florida Institute of Technology, Florida, FL, USA*

BINARY IMAGE RECOGNITION UTILIZING COMPUTER GENERATED TEMPLATES

Technical Paper Publication. DETC2017-67983

Dustin D. Bielecki, *University at Buffalo, Buffalo, NY, USA,* ***Prakhar Jaiswal,*** *University at Buffalo-SUNY, Buffalo, NY, USA,* ***Rahul Rai,*** *University at Buffalo, Buffalo, NY, USA*

DEVELOPING AN ACTIVITY MODEL FOR SELECTING DIMENSIONAL-METROLOGY SYSTEMS IN INSPECTION PLANNING

Technical Paper Publication. DETC2017-68013

Shaw Feng, *NIST, Gaithersburg, MD, USA,* ***Thomas Kramer,*** *The Catholic University of America, Washington, DC, USA,* ***John Horst,*** *NIST, Gaithersburg, MD, USA,* ***Thomas Hedberg,*** *National Institute of Standards and Technology, Gaithersburg, MD, USA,* ***Allison Bernard Feeney,*** *NIST, Gaithersburg, MD, USA*

POINT-BASED SHAPE MONITORING OF PLATE BENDING FOR LARGE-SCALE STRAGE TANKS

Technical Paper Publication. DETC2017-68105

Fukano Kenta, *IHI Corporation, Yokohama, Japan,* ***Ataru Kobayashi,*** *The University of Elector-Communications, Tokyo, Japan,* ***Hiroshi Masuda,*** *The University of Electro-Communications, Chofu, Japan,* ***Kazuki Ikeda,*** *IHI Corporation, Yokohama, Japan*

CIE-14-1: DESIGN INFOMATICS

CONCOURSE LEVEL, ROOM 3 **8:00AM–9:40AM**

Session Organizer: **Ying Liu,** *Cardiff University, Cardiff, United Kingdom*

Session Co-Organizer: **Bryony DuPont,** *Oregon State University, Oregon, OR, USA*

ORDER BEYOND CHAOS: INTRODUCING THE NOTION OF GENERATION TO CHARACTERIZE THE CONTINUOUSLY EVOLVING IMPLEMENTATIONS OF CYBER-PHYSICAL SYSTEMS

Technical Paper Publication. DETC2017-67082

Imre Horvath, *Delft University of Technology, Delft, Zuid Holland, Netherlands,* ***Zoltan Rusak,*** *Delft University of Technology, Delft, x, Netherlands,* ***Yongzhe Li,*** *TU Delft, Delft, Zuid Holland, Holland Netherlands*

A RULE-BASED DECISION SUPPORT SYSTEM FOR AUTHORING TECHNICAL INSTRUCTIONS

Technical Paper Publication. DETC2017-67427

Rahul Renu, Lynn Hanson, *Francis Marion University, Florence, SC, USA*

ENGINEERING DESIGN ANALYSIS TOOL FOR EARLY DESIGN PHASE WITH LOW-FIDELITY MODELS: A CASE OF HYDRAULIC CRANE

Technical Paper Publication. DETC2017-67493

Asko Ellman, *Tampere University of Tech, Tampere, Finland,* ***Sami Pajunen, Ilari Laine,*** *Tampere University of Technology, Tampere, Finland,* ***Eric Coatanea,*** *Tampere University of Technology, Tampere, Finland*

PATTERN MINING FOR LEARNING TYPICAL TURBINE RESPONSE DURING DYNAMIC WIND TURBINE EVENTS

Technical Paper Publication. DETC2017-67910

Len Feremans, Boris Cule, *Universiteit Antwerpen, Antwerpen, Antwerpen, Belgium,* ***Christof Devriendt,*** *Vrije Universiteit Brussel, Brussel, Brussel, Belgium,* ***Bart Goethals,*** *Universiteit Antwerpen, Antwerpen, Antwerpen, Belgium,* ***Jan Helsen,*** *Vrije Universiteit Brussel, Brussel, Belgium*

DEEP LEARNING FOR DESIGN IN CONCEPT CLUSTERING

Technical Paper Publication. DETC2017-68352

Chengwei Zhang, *Tsinghua University, Beijing, China,* ***Youngwook Paul Kwon, Julia Kramer,*** *University of California, Berkeley, Berkeley, CA, USA,* ***Euiyoung Kim,*** *UC Berkeley, Berkeley, CA, USA,* ***Alice Agogino,*** *University of California, Berkeley, Berkeley, CA, USA*

DAC-4-1: DECISION MAKING IN ENGINEERING DESIGN

CONCOURSE LEVEL, ROOM 6 **8:00AM–9:40AM**

Session Organizer: **Kemper Lewis,** *University at Buffalo–SUNY, Buffalo, NY, USA*

Session Co-Organizer: **Jesse Austin-Breneman,** *University of Michigan, Ann Arbor, Ann Arbor, MI, USA*

TWO APPLICATIONS OF DESIGN AS A SEQUENTIAL DECISION PROCESS

Technical Paper Publication. DETC2017-68150

Simon Miller, *Applied Research Laboratory/Penn State University, State College, PA, USA,* ***Timothy W. Simpson,*** *Penn State University, University Park, PA, USA,* ***Michael Yukish,*** *PSU/ARL, State College, PA, USA*

EMPLOYING MULTIDIMENSIONAL DATA VISUALIZATION TOOLS TO ASSESS THE IMPACT OF CONSTRAINT UNCERTAINTIES ON COMPLEX DESIGN PROBLEMS

Technical Paper Publication. DETC2017-67902

Gary Stump, *ARL/Penn State, State College, PA, USA,* ***Simon Miller,*** *Applied Research Laboratory/Penn State University, State College, PA, USA,* ***Mike Yukish,*** *ARL/Penn State, University Park, PA, USA,* ***Christopher Farrell,*** *U. S. Army, Washington, D. C., DC, USA*

MODELING THE DYNAMICS OF INNOVATION IN ENGINEERED SYSTEMS

Technical Paper Publication. DETC2017-68180

Aziz Naim, *HVR APC, Amherst, NY, USA,* ***Kemper Lewis,*** *University at Buffalo – SUNY, Buffalo, NY, USA*

HYBRID PROCEDURE-BASED DESIGN STRATEGIES AUGMENTED WITH OPTIMIZATION
Technical Paper Publication. DETC2017-68348

Madhav Arora, *University of Illinois at Urbana-Champaign, Champaign, IL, USA,* ***Siyao Luan,*** *University of Illinois, Urbana, IL, USA,* ***Deborah Thurston,*** *University of Illinois at Urbana-Champaign, Chicago, CA, USA,* ***James Allison,*** *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

AN EXPERIMENTAL STUDY OF FEEDBACK AND RISK IN ENGINEERING DECISION-MAKING
Technical Paper Publication. DETC2017-68336

Mojtaba Arezoomand, Jesse Austin-Breneman, *University of Michigan, Ann Arbor, Ann Arbor, MI, USA*

DAC-19-3: SIMULATION-BASED DESIGN UNDER UNCERTAINTY 3

CONCOURSE LEVEL, ROOM 7 **8:00AM–9:40AM**

Session Organizer: **Mian Li,** *Shanghai Jiao Tong University, Shanghai, China*

Session Co-Organizer: **Zissimos Mourelatos,** *Oakland University, Rochester, MI, USA*

ROBUST OPTIMIZATION WITH PARAMETER AND MODEL UNCERTAINTIES USING GAUSSIAN PROCESSES WITH LIMITED SAMPLES
Technical Paper Publication. DETC2017-67291

Yanjun Zhang, Mian Li, *Shanghai Jiao Tong University, Shanghai, China*

UNCERTAINTY MODELING USING MIXTURE DISTRIBUTIONS IN ENGINEERING SYSTEMS
Technical Paper Publication. DETC2017-68409

Vijitashwa Pandey, *Oakland University, Oakland, CA, USA,* ***Zissimos Mourelatos, Judson Estes,*** *Oakland University, Rochester, MI, USA*

AN APPROACH TO FLEXIBLE-ROBUST OPTIMIZATION OF LARGE-SCALE SYSTEMS
Technical Paper Publication. DETC2017-67221

Arpan Biswas, Yong Chen, Christopher Hoyle, *Oregon State University, Corvallis, OR, USA*

ADAPTIVE SURROGATE MODELING FOR MULTIDISCIPLINARY RELIABILITY ANALYSIS UNDER TIME-DEPENDENT UNCERTAINTY
Technical Paper Publication. DETC2017-67383

Zhen Hu, Sankaran Mahadevan, *Vanderbilt University, Nashville, TN, USA*

RESTRAINT SYSTEMS IN TACTICAL VEHICLES: UNCERTAINTY STUDY INVOLVING AIRBAGS, SEATBELTS AND MILITARY GEAR
Technical Paper Publication. DETC2017-67362

Dorin Drignei, Zissimos Mourelatos, Ervisa Zhamo, *Oakland University, Rochester, MI, USA,* ***Jingwen Hu,*** *University of Michigan, Ann Arbor, MI, USA,* ***Cong Chen,*** *University of Michigan, Ann Arbor, MI, USA,* ***Matthew Reed,*** *University of Michigan, Ann Arbor, MI, USA*

DTM-12-1: ENTREPRENEURSHIP AND TEAMS IN DESIGN

EXHIBIT HALL LEVEL, ROOM 20 **8:00AM–9:40AM**

Session Organizer: **Jonathan Cagan,** *Carnegie Mellon University, Pittsburgh, PA, USA*

Session Co-Organizer: **Claudia Eckert,** *Open University, Milton Keynes, United Kingdom*

VALIDATING A TOOL FOR PREDICTING PROBLEM-SPECIFIC OPTIMIZED TEAM CHARACTERISTICS
Technical Paper Publication. DETC2017-67430

Christopher McComb, *Carnegie Mellon University, Pittsburgh, PA, USA,* ***Jonathan Cagan,*** *Carnegie Mellon University, Pittsburgh, PA, USA,* ***Kenneth Kotovsky,*** *Carnegie Mellon University, Pittsburgh, PA, USA*

EXPLORATION OF ENTREPRENEURIAL STUDENT TEAMS PERFORMANCE AND STUDENT TEAM MEMBERS' PERSONALITY VIA THE BIG FIVE TEST
Technical Paper Publication. DETC2017-67922

José E. Lugo, *University of Puerto Rico, Mayaguez, PR, USA,* ***Mari L. Zapata-Ramos,*** *University of Puerto Rico at Mayaguez, Mayaguez, PR, USA,* ***Carla P. Puig,*** *University of Puerto Rico at Mayaguez, Mayagüez, PR, USA*

CREATIVITY OF CONCEPT IDEATION METHODS AS AFFECTED BY TEAM PERSONALITY
Technical Paper Publication. DETC2017-67974

Friederich Berthelsdorf, Robert Stone, *Oregon State University, Corvallis, OR, USA*

THE DESIGN OF THE CROWD: ORGANIZING MASS COLLABORATION EFFORTS
Technical Paper Publication. DETC2017-68127

Zachary Ball, *University at Buffalo, SUNY, Amherst, NY, USA,* ***Kemper Lewis,*** *University at Buffalo – SUNY, Buffalo, NY, USA*

CAN WEARABLE SENSORS BE USED TO CAPTURE ENGINEERING DESIGN TEAM INTERACTIONS?: AN INVESTIGATION INTO THE RELIABILITY OF SOCIOMETRIC BADGES
Technical Paper Publication. DETC2017-68183

Hong-En Chen, Scarlett Miller, *The Pennsylvania State University, University Park, PA, USA*

MR-2-2: PLANAR AND SPATIAL MECHANISMS

EXHIBIT HALL LEVEL, ROOM 11 **8:00AM–9:40AM**

Session Organizer: **Leila Notash,** *Queens University, Kingston, ON, Canada*

Session Co-Organizer: **Feng Gao,** *Shanghai Jiao Tong University, Shanghai, China*

CONJUGATION CURVATURE THEORY OF HIGHER PAIRS
Technical Paper Publication. DETC2017-68285

Kwun-Lon Ting, *Tennessee Technological University, Cookeville, TN, USA,* ***Zhiyuan Yu,*** *Tennessee Technological University, Cookeville, TN, USA*

HIGHER-ORDER LOCAL ANALYSIS OF KINEMATIC SINGULARITIES OF LOWER PAIR LINKAGES

Technical Paper Publication. DETC2017-67039

Andreas Mueller, *Johannes Kepler University, Institute of Robotics, Linz, Austria*

A 6R SINGLE-LOOP OVERCONSTRAINED SPATIAL MECHANISM THAT HAS TWO PAIRS OF REVOLUTE JOINTS WITH INTERSECTING AXES AND ONE PAIR OF REVOLUTE JOINTS WITH PARALLEL AXES

Technical Paper Publication. DETC2017-67419

Xianwen Kong, Xiuyun He, *Heriot-watt University, Edinburgh, Scotland,* ***Duanling Li,*** *Beijing University of Posts and Telecommunications, Beijing, China*

A MODULAR METHOD FOR MANUFACTURING ERROR ANALYSIS OF LINKAGES AND MANIPULATORS

Technical Paper Publication. DETC2017-68163

Kwun-Lon Ting, *Tennessee Technological University, Cookeville, TN, USA,* ***Kuan-Lun Hsu,*** *Tennessee Technological University, Cookeville, TN, USA,* ***Long-long Wu,*** *National Tsing Hua University, Hsinchu, Taiwan,* ***Jun Wang,*** *Hubei University of Technology, Wuhan, China*

GENERALIZED UNIFIED CLOSED FORM INVERSE KINEMATICS FOR MOBILE MANIPULATORS WITH REUSABLE REDUNDANCY PARAMETERS

Technical Paper Publication. DETC2017-68104

Shashank Sharma, Christian Scheurer, *KUKA Roboter GmbH, Augsburg, Germany, Germany*

MR-3-1: LIGHTENING PRESENTATIONS

EXHIBIT HALL LEVEL, ROOM 9 **8:00AM–9:40AM**

Session Organizer: **Charles Kim,** *Bucknell University, Lewisburg, PA, USA*

Session Co-Organizer: **Girish Krishnan,** *UIUC, Urbana, IL, USA*

PASSIVE PROSTHETIC FOOT SHAPE AND SIZE OPTIMIZATION USING LOWER LEG TRAJECTORY ERROR

Technical Paper Publication. DETC2017-67618

Kathryn Olesnavage, *Amos Winter, MIT, Cambridge, MA, USA*

DECOUPLING STIFFNESS FROM POSITION IN JOINT MECHANISMS: APPLIED TO POWERED ANKLE PROSTHESIS

Technical Paper Publication. DETC2017-68113

Robert Holgate, *SpringActive, Inc., Tempe, AZ, USA,* ***Thomas Sugar,*** *Arizona State University, Tempe, AZ, USA*

BIOMECHANICAL DESIGN OF A NOVEL SIX DOF COMPLIANT PROSTHETIC ANKLE-FOOT 2.0 FOR REHABILITATION OF AMPUTEE

Technical Paper Publication. DETC2017-67700

Thanh-Phong Dao, *Ton Duc Thang University, Ho Chi Minh, Viet Nam,* ***Tan Thang Nguyen,*** *HCM University of Technology and Education, Ho Chi Minh, Non us State, Viet Nam,* ***Shyh-chour Huang,*** *National Kaohsiung University of Applied Sciences, Kaohsiung 807, Taiwan*

DESIGN AND ANALYSIS OF A SHELL MECHANISM BASED TWO-FOLD FORCE CONTROLLED SCOLIOSIS BRACE

Technical Paper Publication. DETC2017-67812

Joep Nijssen, *Delft University of Technology, Delft, Netherlands,* ***JB Ring,*** *Bucknell University, Baltimore, MD, USA,* ***Giuseppe Radaelli,*** *Delft University of Technology, Delft, Netherlands,* ***Justus Herder,*** *TU Delft, Rotterdam 3036xs, Netherlands,* ***Charles Kim,*** *Bucknell University, Lewisburg, PA, USA*

MODELING LENGTH EFFECTS OF BRAIDED PNEUMATIC ACTUATORS

Technical Paper Publication. DETC2017-67458

Alexander Hunt, *Portland State University, Portland, OR, USA,* ***Alexander Graber-Tilton,*** *Case Western Reserve University, Cleveland, OH, USA,* ***Roger Quinn,*** *Case Western Reserve University, Cleveland, OH, USA*

A CONSTITUTIVE MODEL FOR TORSIONAL LOADS ON FLUID-DRIVEN SOFT ROBOTS

Technical Paper Publication. DETC2017-67970

Audrey Sedal, Daniel Bruder, Joshua Bishop-Moser, Ram Vasudevan, Sridhar Kota, *University of Michigan, Ann Arbor, MI, USA*

BIMATERIAL MICRO-STRUCTURED ANNULUS WITH ZERO THERMAL EXPANSION COEFFICIENT

Technical Paper Publication. DETC2017-68142

Yan Xie, *Beihang University, Beijing, China,* ***Dengfeng Lu,*** *Institute of Electronic, Chinese Academy of Sciences, Beijing, China,* ***Jingjun Yu,*** *Beihang University/Robotics Institute, Beijing, China*

OPTIMIZATION OF A COMPLIANT ENDOSCOPIC RADIOFREQUENCY ABLATION ELECTRODE

Technical Paper Publication. DETC2017-67357

Bradley Hanks, *Pennsylvania State University, University Park, PA, USA,* ***Mary Frecker,*** *Pennsylvania State University, University Park, PA, USA,* ***Matthew Moyer,*** *Penn State Hershey Medical Center, Hershey, PA, USA*

GEOMETRY OPTIMIZATION OF FLEXURE SYSTEM TOPOLOGIES USING THE BOUNDARY LEARNING OPTIMIZATION TOOL (BLOT)

Technical Paper Publication. DETC2017-67465

Ali Hatamizadeh, Yuanping Song, *UCLA, Los Angeles, CA, USA,* ***Jonathan Hopkins,*** *University of California, Los Angeles, Los Angeles, CA, USA*

DESIGN AND ANALYSIS OF SYMMETRICAL, MONOLITHIC TIP-TILT-PISTON FLEXURE STAGES

Technical Paper Publication. DETC2017-67270

Guangbo Hao, *University College Cork, Cork, Ireland*

OPTIMIZATION FOR LARGE AND LINEAR TUNABLE STIFFNESS CONTROL WITH A CONCENTRIC CIRCULAR TAPERED BEAM DESIGN

Technical Paper Publication. DETC2017-67346

Shane Johnson, *UM-SJTU Joint Institute, Shanghai Jiao Tong University, Shanghai, China,* ***Anton Van Beek,*** *UM SJTU JI, Shanghai, China,* ***Zeeshan Qaiser, Liping Kang,*** *UM-SJTU Joint Institute, Shanghai, China*

REDUCTION OF STRESS IN PLASTIC COMPLIANT MECHANISMS BY INTRODUCING METALLIC REINFORCEMENT
Technical Paper Publication. DETC2017-68426

Joshua A. Crews, *GKN Aerospace–St. Louis, Hazelwood, MO, USA,* ***Ashok Midha,*** *Missouri University of Science and Technology, Rolla, MO, USA,* ***Lokeswarappa R. Dharani,*** *Missouri University of Science and Technology, Rolla, MO, USA*

MNS-4-1: MICRO/NANO ROBOTICS AND MANUFACTURING

EXHIBIT HALL LEVEL, ROOM 13 **8:00AM–9:40AM**

Session Organizer: **Ashis Banerjee,** *University of Washington, Seattle, WA, USA*

Session Co-Organizers: **Irene Fassi,** *Institute of Industrial Technologies and Automation, Bergamo, Italy,* **David Cappelleri,** *Purdue University, West Lafayette, IN, USA,* **Gloria Wiens,** *University of Florida, Gainesville, FL, USA*

DESIGN STRATEGIES FOR VACUUM MICRO-GRIPPERS WITH INTEGRATED RELEASE SYSTEM
Technical Paper Publication. DETC2017-67714

Serena Ruggeri, Gianmauro Fontana, *CNR-ITIA, Milan, Italy,* ***Giovanni Legnani,*** *University of Brescia, Brescia, Italy,* ***Irene Fassi,*** *Institute of Industrial Technologies and Automation, Bergamo, Italy*

DEVELOPMENT OF AN AUTOMATED FLEXIBLE MICRO-SOLDERING STATION
Technical Paper Publication. DETC2017-68107

Vinoth Venkatesan, David Cappelleri, *Purdue University, West Lafayette, IN, USA*

ELECTRICITY GENERATION THROUGH STIMULUS-RESPONSIVE SMART LOCOMOTIONS OF FUNCTIONALLY COOPERATING SYSTEMS
Technical Presentation. DETC2017-67650

Feng Shi, *Beijing University of Chemical Technology, Beijing, China*

SELF-PROPULSION FOR PRECISE MACROSCOPIC SUPRAMOLECULAR ASSEMBLY
Technical Presentation. DETC2017-67653

Mengjiao Cheng, *Beijing University of Chemical Technology, Beijing, China, China*

PRESSURE-RESPONSIVE LOCOMOTION AND ITS POTENTIAL APPLICATION IN POWERING CARDIAC PACEMAKER
Technical Presentation. DETC2017-67695

Lina Zhang, *Beijing University of Chemical Technology, Beijing, China*

MNS-7-1: MICROSCALE ENERGY HARVESTING

EXHIBIT HALL LEVEL, ROOM 22 **8:00AM–9:40AM**

Session Organizer: **Yong Shi,** *Stevens Inst of Tech, Hoboken, NJ, USA*

A FLOW-INDUCED STRUCTURE-BASED KINETIC ENERGY HARVESTER
Technical Paper Publication. DETC2017-67711

Guangcheng Zhang, *University of Nottingham, Ningbo Campus, Ningbo, Zhejiang, China,* ***Yueh-Jaw Lin,*** *University of Nottingham Ningbo China, Ningbo, Zhejiang, China,* ***Christian Klumpner,*** *University of Nottingham, Nottingham, United Kingdom*

ELECTRICAL IMPEDANCE MATCHING OF PZT NANOGENERATORS
Technical Paper Publication. DETC2017-67981

Richard Galos, *Stevens Institute, Hoboken, NJ, USA,* ***Zhongjing Ren, Hao Sun,*** *Stevens Institute of Technology, Hoboken, NJ, USA,* ***Yong Shi,*** *Stevens Inst of Tech, Hoboken, NJ, USA*

STABILITY, BIOCOMPATIBILITY AND IN VIVO PERFORMANCE OF IMPLANTABLE NANOGENERATORS
Technical Presentation. DETC2017-68071

Jun Li, Yanhao Yu, Xudong Wang, *University of Wisconsin, Madison, WI, USA*

DESIGN OF A HIGH EFFICIENCY WIRELESS ENERGY TRANSFER SYSTEM FOR MICRO/NANO SATELLITE
Technical Paper Publication. DETC2017-68392

Lixin LI, Zihe Zhang, Wenzhong Yan, Ang Gao, *Northwestern Polytechnical University, Xi'an, Shaanxi, China,* ***Zhu Han,*** *University of Houston, Houston, TX, USA*

MESA-3-1: MECHATRONIC & EMBEDDED SYSTEMS THEORY AND DESIGN METHODOLOGIES

EXHIBIT HALL LEVEL, ROOM 14 **8:00AM–9:40AM**

Session Organizer: **Jia Xu,** *York University, Toronto, ON, Canada*

Session Co-Organizer: **Jürgen Hausladen,** *University of Applied Sciences Technikum Wien, Wien, Austria*

INTEGRATION OF STATIC WORST-CASE EXECUTION TIME & STACK USAGE ANALYSIS FOR EMBEDDED SYSTEMS SOFTWARE IN A CLOUD-BASED DEVELOPMENT ENVIRONMENT
Technical Paper Publication. DETC2017-67402

Jürgen Hausladen, *University of Applied Sciences Technikum Wien, Wien, Austria,* ***Florian Gerstmayer, Thomas Jerabek,*** *University of Applied Sciences Technikum Wien, Vienna, Austria,* ***Martin Horauer,*** *UAS Technikum Wien, Wien, Austria*

METHODS FOR PROTECTION OF INTELLECTUAL PROPERTY IN EMBEDDED LINUX: A SURVEY
Technical Paper Publication. DETC2017-67422

Florian Gerstmayer, *University of Applied Sciences Technikum Wien, Vienna, Austria,* ***Jürgen Hausladen,*** *University of Applied Sciences Technikum Wien, Wien, Austria,* ***Martin Horauer,*** *UAS Technikum Wien, Wien, Austria,* ***Michael Kramer,*** *University of Applied Sciences Technikum Wien, Vienna, Austria*

PREDICTION METHODOLOGY OF TRACTION DRIVE CHARACTERISTICS FOR HALF-TOROIDAL VARIATOR SYSTEM
Technical Paper Publication. DETC2017-67515

Toshihiro Saito, *Honda R&D Co.,Ltd. Automobile R&D Center, Haga-gun, Tochigi, Japan,* ***Yoshitaka Tamoto,*** *Idemitsu Kosan Co.,Ltd., Tokyo, Japan,* ***Eiji Inoue,*** *NSK Ltd., Fujisawa-shi, Kanagawa, Japan*

EFFICIENTLY HANDLING PROCESS OVERRUNS AND UNDERRUNS ON MULTIPROCESSORS IN REAL-TIME EMBEDDED SYSTEMS
Technical Paper Publication. DETC2017-68412

Jia Xu, *York University, Toronto, ON, Canada*

MESA-22-3: MESA-22 DISTURBANCE REJECTION CONTROL (DRC) III

EXHIBIT HALL LEVEL, ROOM 19 **8:00AM–9:40AM**

Session Organizer: **Wenchao Xue,** *Chinese Academy of Sciences, Tianjin, China*

Session Co-Organizer: **Dazi Li,** *Beijing University of Chemical Technology, Beijing, China*

ON THE ESO BASED REINFORCEMENT LEARNING FOR PURE FEEDBACK SYSTEMS
Technical Paper Publication. DETC2017-67659

Dazi Li, Wang Wei, *Beijing University of Chemical Technology, Beijing, China,* ***Zhiqiang Gao,*** *Cleveland State University, Cleveland, OH, USA*

LINEAR ACTIVE DISTURBANCE REJECTION CONTROL FOR GRID-CONNECTED INVERTER WITH LCL FILTER
Technical Paper Publication. DETC2017-67148

Yuchang Ling, *South China University of Technology, GuangZhou, China,* ***Junyi Dong,*** *China Nuclear Power Engineering Co,Ltd., ShenZhen, China,* ***Hongbo Yang,*** *China Nuclear Power Engineering Co, Ltd. 518124, ShenZhen, China,* ***Yali Xue,*** *Tsinghua University, Beijing, China,* ***Jiang Zeng,*** *South China University of Technology, GuangZhou, China,* ***Donghai Li,*** *Tsinghua University, Beijing, China*

A ROBUST CONTROL INTERPRETATION ON GENERALIZED SEPARATION PRINCIPLE OF ACTIVE DISTURBANCE REJECTION CONTROL
Technical Paper Publication. DETC2017-67444

Huiyu Jin, *Xiamen University/UC Irvine, Irvine, CA, USA,* ***Weiyao Lan,*** *Xiamen University, Xiamen, Fujian Province, China*

MSNDC-3-1: FLEXIBLE MULTIBODY DYNAMICS–1

BALLROOM LEVEL, ROOM 26C **8:00AM–9:40AM**

Session Organizer: **Johannes Gerstmayr,** *Leopold-Franzens University Innsbruck, Innsbruck, Austria*

Session Co-Organizer: **Shilei Han,** *University of Maryland, College Park, MD, USA*

DEVELOPMENT OF REDUCED ORDER THERMOMECHANICAL MODEL USING FLOATING FRAME OF REFERENCE FORMULATION
Technical Paper Publication. DETC2017-67317

Hiroki Yamashita, *The University of Iowa, Iowa City, IA, USA,* ***Rohit Arora, Hiroyuki Kanazawa,*** *Mitsubishi Heavy Industries, Takasago, Hyogo, Japan,* ***Hiroyuki Sugiyama,*** *The University of Iowa, Iowa City, IA, USA*

BOUNDARY CONDITIONS AND CRAIG-BAMPTON SUBSTRUCTURING TECHNIQUE WITH FREE-FREE MODES
Technical Paper Publication. DETC2017-67397

Grzegorz Orzechowski, Aki M. Mikkola, *Lappeenranta University of Technology, Lappeenranta, Finland*

COMPARISON OF CONTROL METHODS FOR TWO-LINK PLANAR FLEXIBLE MANIPULATOR
Technical Paper Publication. DETC2017-67937

Joseph Bowkett, Rudranarayan Mukherjee, *Jet Propulsion Laboratory, Pasadena, CA, USA*

REDUCED-ORDER MODELLING OF MULTIBODY CONTACT PROBLEMS: A NOVEL SEMI-ANALYTIC METHOD
Technical Paper Publication. DETC2017-67948

Niccolo Cappellini, Bart Blockmans, Jakob Fiszer, *KU Leuven, Leuven, Leuven, Belgium,* ***Tommaso Tamarozzi,*** *Siemens Industry Software nv, Leuven, Belgium,* ***Francesco Cosco, Wim Desmet,*** *KU Leuven, Leuven, Belgium*

MSNDC-5-4: NONLINEAR DYNAMICS OF STRUCTURES IV

BALLROOM LEVEL, ROOM 25B **8:00AM–9:40AM**

Session Organizer: **Enrico Babilio,** *Universita degli Studi di Napoli Federico II, Napoli, Italy*

Session Co-Organizer: **Laura Ruzziconi,** *Polytechnic University of Marche, Ancona, Italy*

NONLINEAR DYNAMICS OF FGM CONICAL PANEL WITH INITIAL IMPERFECTION IN THERMAL ENVIRONMENT
Technical Paper Publication. DETC2017-67156

Minghui Yao, *College of Mechanical Engineering Beijing University of Technology, Beijing, China,* ***Yan Niu,*** *Beijing University of Technology, Beijing, China,* ***Wei Zhang,*** *Beijing University of Technology, Beijing, China*

VIBRATION CHARACTERISTICS ANALYSIS OF THE ROTATING BLADE BASED ON A POLYNOMIAL AERODYNAMIC FORCE
Technical Paper Publication. DETC2017-67162

Minghui Yao, *College of Mechanical Engineering Beijing University of Technology, Beijing, China,* ***Li Ma, Mingming Zhang,*** *Beijing University of Technology, Beijing, China,* ***Wei Zhang,*** *Beijing University of Technology, Beijing, China*

NONLINEAR VIBRATION OF A ROTOR-ACTIVE MAGNETIC BEARING SYSTEM WITH 16-POLE LEGS
Technical Paper Publication. DETC2017-67103

Ruiqin Wu, Wei Zhang, *Beijing University of Technology, Beijing, China,* ***Minghui Yao,*** *College of Mechanical Engineering Beijing University of Technology, Beijing, China*

ANALYSIS OF NONLINEAR DYNAMICS OF A ROTOR-ACTIVE MAGNETIC BEARING SYSTEM WITH 16-POLE LEGS
Technical Paper Publication. DETC2017-67105

Ruiqin Wu, Wei Zhang, *Beijing University of Technology, Beijing, China,* ***Minghui Yao,*** *College of Mechanical Engineering Beijing University of Technology, Beijing, China*

PTG-4-1: GEARBOX DESIGN, RELIABILITY, AND DIAGNOSTICS (1)

EXHIBIT HALL LEVEL, ROOM 15 **8:00AM–9:40AM**

Session Organizer: **Brian Dykas,** *US Army Research Lab, APG, MD, USA*

Session Co-Organizer: **J.C. Wang,** *Meritor Inc., Troy, MI, USA*

STRUCTURE SENSITIVITY ANALYSIS AND DYNAMIC PERFORMANCE OPTIMIZATION OF MARINE GEARBOX
Technical Paper Publication. DETC2017-67072

Tengjiao Lin, Daokun Xie, Ziran Tan, Bo Liu, *Chongqing University, Chongqing, Chongqing, China*

NUMERICAL INVESTIGATION ON INFLUENCE FACTORS OF RADIATION NOISE OF THE BRIDGE CRANE HELICAL GEAR REDUCER
Technical Paper Publication. DETC2017-67076

Liu Wen, Biao Gao, Tengjiao Lin, Jinhong Zhang, *Chongqing University, Chongqing, Chongqing, China*

A METHOD TO DETERMINE GRINDING WHEEL PROFILES FOR MANUFACTURING THREADS IN PLANETARY ROLLER SCREW MECHANISM
Technical Paper Publication. DETC2017-67012

Xiaojun Fu, *Northwestern Polytechnical University, Xi'an, China,* ***Geng Liu,*** *Northwestern Polytechnical University, Xi'an, Shannxi, China,* ***Shangjun Ma, Wenjie Zhang,*** *Northwestern Polytechnical University, Xi'an, China*

INVESTIGATION ON THE LUBRICATION PERFORMANCES AND THERMAL CHARACTERISTICS OF THE TAPERED ROLLER BEARING
Technical Paper Publication. DETC2017-67052

Yunjia Zhang, Dengfang Ruan, *Chongqing University, Chongqing, China*

PTG-6-1: LUBRICATION AND EFFICIENCY (1)

EXHIBIT HALL LEVEL, ROOM 16 **8:00AM–9:40AM**

Session Organizer: **Timothy Krantz,** *NASA Glenn Research Center MS 23-3, Cleveland, OH, USA*

Session Co-Organizer: **Kazumasa Kawasaki,** *Niigata University, Niigata, Niigata, Japan*

A STUDY ON THE INFLUENCE OF MICRO SURFACE TEXTURE ON MIXED EHL FRICTION
Technical Paper Publication. DETC2017-67002

Sheng Li, Utsav Parmar, *Wright State University, Dayton, OH, USA*

FRICTION MODEL USING FULL ELASTOHYDRODYNAMIC LUBRICATION FOR SPIRAL BEVEL GEARS
Technical Paper Publication. DETC2017-67646

Srikumar C Gopalakrishnan, Yawen Wang, *University of Cincinnati, Cincinnati, OH, USA,* ***Teik Lim,*** *The University of Texas at Arlington, Fort Worth, TX, USA*

INFLUENCE OF DEFINED WATER CONTENTS IN GEAR LUBRICANTS ON THE PITTING PERFORMANCE OF CASE-CARBURIZED GEARS
Technical Paper Publication. DETC2017-67016

Christian Engelhardt, *Technical University of Munich, Garching, Germany,* ***Jochen Witzig,*** *ZF Friedrichshafen AG, Kressbronn, Germany,* ***Thomas Tobie,*** *Fzg Gear Res Centre, Garching, Germany,* ***Karsten Stahl,*** *Technical University of Munich, Germany*

GRAPH-BASED ALGORTHIM FOR POWER CIRCULATION AND EFFICIENCY ANALYSIS OF A PLANETARY GEAR REDUCER
Technical Paper Publication. DETC2017-67219

Essam L. Esmail, *University of Al-Qadisiyah, Iraq, Iraq,* ***Anahed Hussein Juber,*** *University of Al-Qadisiyah, Dywaniyah, State, Iraq*

AN EXPERIMENTAL STUDY OF INFLUENCE OF LUBRICATION METHODS ON EFFICIENCY AND CONTACT FATIGUE LIFE OF SPUR GEARS
Technical Paper Publication. DETC2017-67518

Jeremy Moss, *The Ohio State University, Columbus, OH, USA,* ***Ahmet Kahraman,*** *Ohio State University, Columbus, OH, USA,* ***Carlos Wink,*** *Eaton Corp., Portage, MI, USA*

VIB-8-1: ROTATING SYSTEMS AND ROTOR DYNAMICS I

[Cross-listed with MSNDC-7]

BALLROOM LEVEL, ROOM 25A **8:00AM–9:40AM**

Session Organizer: **C. Nataraj,** *Villanova University, Villanova, PA, USA*

AN INNOVATIVE MODEL FOR THE INVESTIGATION OF ROTOR UNSTABLE THERMAL BEHAVIOR
Technical Paper Publication. DETC2017-67059

Enrico Meli, Alessandro Abati, Amedeo Frilli, *Florence University, Florence, Italy,* ***Daniele Panara,*** *General Electric, Florence, Italy,* ***Simone Panconi,*** *Florence University, Florence, Italy,* ***Alessandro Ridolfi,*** *University of Florence, Florence, Italy,* ***Andrea Rindi,*** *Florence University, Florence, Italy*

A VIRTUAL BEARING METHOD FOR OPTIMAL BEARING PLACEMENT OF FLEXIBLE ROTOR SYSTEMS

Technical Paper Publication. DETC2017-67216

Shibing Liu, *Hyperloop One, LA, CA, USA,* ***Bingen Yang,*** *University of Southern California, Los Angeles, CA, USA*

VIBRATION CONTROL OF A ROTATING CANTILEVER BEAM BY USING THE GIANT MAGNETOSTRICTIVE ACTUATOR

Technical Paper Publication. DETC2017-67320

Xueping Xu, Qinkai Han, Fulei Chu, *Tsinghua University, Beijing, China*

APPLICATION OF THE MAGNETORHEOLOGICAL SQUEEZE FILM DAMPERS FOR REDUCING ENERGY LOSSES IN SUPPORTS OF ROTORS OF ROTATING MACHINES

Technical Paper Publication. DETC2017-67433

Jaroslav Zapomel, *Institute of Thermomechanics, Prague, Czech Republic,* ***Petr Ferfecki,*** *VSB-Technical University of Ostrava, Ostrava, Czech Republic*

IN-PLANE BLADE-HUB DYNAMICS OF HORIZONTAL-AXIS WIND TURBINE WITH MISTUNED BLADES

Technical Paper Publication. DETC2017-67687

Ayse Sapmaz, *Michigan State University, East Lansing, MI, USA,* ***Gizem Acar,*** *University of Maryland, College Park, MD, USA,* ***Brian Feeny,*** *Michigan State University, East Lansing, MI, USA*

DFMLC-12-1: NSF WORKSHOP

EXHIBIT HALL LEVEL, ROOM 21 **8:00AM–11:40AM**

Session Organizer: **Gul Kremer,** *Iowa State University, Iowa, IA, USA*

George Hazelrigg, *National Science Foundation, CMMI,* ***Rich Malak,*** *National Science Foundation*

AVT-6-1: ADVANCES IN LIGHT VEHICLES DESIGN

EXHIBIT HALL LEVEL, ROOM 24 **10:00AM–11:40AM**

Session Organizer: **Alberto Doria,** *University of Padova-Dept of Industrial Eng, Padova, Italy*

Session Co-Organizer: **Luis Munoz,** *Universidad de los Andes, Bogota, Cundinamarca, Colombia*

A DOE APPROACH FOR EVALUATING THE EFFECT OF BICYCLE PROPERTIES ON STABILITY

Technical Paper Publication. DETC2017-67225

Alberto Doria, *University of Padova-Dept of Industrial Eng, Padova, Italy,* ***Valerio Favaron,*** *University of Padova, Padova, Italy,* ***Sergio Roa,*** *Universidad de los Andes, Bogota, Colombia*

ONBOARD WIND SPEED AND ROAD GRADE MEASUREMENT FOR DETERMINATION OF MODEL COEFFICIENTS ON CYCLING

Technical Paper Publication. DETC2017-67759

Sergio Roa, *Universidad de los Andes, Bogota, Colombia,* ***Mateo Morales,*** *Universidad de los Andes, Bogotá, Colombia,* ***Luis Munoz,*** *Universidad de los Andes, Bogota, Cundinamarca, Colombia*

INFLUENCE OF ALTITUDE ON THE PERFORMANCE OF A BICYCLE-CYCLIST SET

Technical Paper Publication. DETC2017-67955

Mateo Morales, *Universidad de los Andes, Bogotá, Colombia,* ***Sergio Roa, Luis Munoz,*** *Universidad de los Andes, Bogota, Colombia,* ***Diego Ferreira,*** *Universidad de los Andes, Bogotá, Colombia,* ***Omar D. Lopez Mejia,*** *Universidad De Los Andes, Bogota, Colombia*

EFFECT OF BODY POSTURE ON COMFORT DURING CYCLING

Technical Paper Publication. DETC2017-68124

Alejandra P. Polanco, Daniel R. Suarez, *Pontificia Universidad Javeriana, Bogotá, Cundinamarca, Colombia,* ***Luis Munoz,*** *Universidad de los Andes, Bogota, Cundinamarca, Colombia*

USE OF MOTION CAPTURE FOR THE ANALYSIS OF COMFORT AND PERFORMANCE IN CYCLING

Technical Presentation. DETC2017-68536

Alejandra P. Polanco, Daniel R. Suarez, *Pontificia Universidad Javeriana, Bogotá, Cundinamarca, Colombia*

CIE-10-1: HUMAN MODELING: METHODS AND APPLICATIONS IN ENGINEERING I

CONCOURSE LEVEL, ROOM 4 **10:00AM–11:40AM**

Session Organizer: **Yujiang Xiang,** *University of Alaska-Fairbanks, Fairbanks, AK, USA*

A METHOD OF UTILIZING DIGITAL MANIKINS TOASSIST PASSENGER VEHICLE DESIGN

Technical Paper Publication. DETC2017-67224

Jian Wan, *Ford Motor Company, Dearborn, MI, USA,* ***Nanxin Wang,*** *Ford Motor Co, Dearborn, MI, USA,* ***Ksenia Kozak, Gianna Gomez-Levi, Linas Mikulionis,*** *Ford Motor Company, Dearborn, MI, USA*

FALL PREVENTION THERAPIES FOR INDIVIDUALS WITH STROKE: A SURVEY

Technical Paper Publication. DETC2017-67456

Erik Chumacero Polanco, *Texas Tech University, Lubbock, TX, USA,* ***James Yang,*** *Texas Tech, Lubbock, TX, USA*

ANALYSIS OF PATIENTS WITH SPINAL CORD INJURY USING MOTION CAPTURE

Technical Paper Publication. DETC2017-67901

Daniele Regazzoni, *University of Bergamo, Dalmine Italy,* ***Andrea Vitali,*** *Università degli studi di Bergamo, Bergamo, Lombardy, Italy,* ***Caterina Rizzi,*** *University of Bergamo, Dalmine (BG), Italy*

FOOT-GROUND INTERACTION FOR 2D GAIT USING CONCURRENT OPTIMIZATION

Technical Paper Publication. DETC2017-67985

Yujiang Xiang, *University of Alaska-Fairbanks, Fairbanks, AK, USA,* ***Benjamin Ramirez, Sarah Hoffman, Tonoy Chowdhury,*** *University of Alaska Fairbanks, Fairbanks, AK, USA*

EFFECT OF ANGULAR MOMENTUM IN ZMP ON HUMAN MOTION PLANNING
Technical Paper Publication. DETC2017-68151

Hyun-Joon Chung, Goobong Chung, *Korea Institute of Robot and Convergence, Pohang, Korea (Republic),* ***Yujiang Xiang,*** *University of Alaska-Fairbanks, Fairbanks, AK, USA*

CIE-16-1: KNOWLEDGE CAPTURE, REUSE AND MANAGEMENT I

CONCOURSE LEVEL, ROOM 5 **10:00AM–11:40AM**

Session Organizer: **David C. Jensen,** *University of Arkansas, Fayetteville, AR, USA*

Session Co-Organizer: **Ian Grosse,** *University of Massachusetts, Amherst, MA, USA*

IMPLICIT KNOWLEDGE DISCOVERY IN DESIGN SEMANTIC NETWORK BY APPLYING PYTHAGOREAN MEANS ON SHORTEST PATH SEARCHING
Technical Paper Publication. DETC2017-67230

Feng Shi, Liuqing Chen, Ji Han, Peter Childs, *Imperial College London, London, United Kingdom*

IDENTIFYING PATENT PRECEDENTS FOR ENGINEERING DESIGN: AN ITERATIVE HEURISTIC METHOD OF MINING TEXT, CITATION AND INVENTOR INFORMATION
Technical Paper Publication. DETC2017-67511

Binyang Song, Jianxi Luo, *Singapore University of Technology and Design, Singapore,*

PDSIDES–A KNOWLEDGE-BASED PLATFORM FOR DECISION SUPPORT IN THE DESIGN OF ENGINEERING SYSTEMS
Technical Paper Publication. DETC2017-67562

Zhenjun Ming, *Beijing Institute of Technology, Beijing, China,* ***Anand Balu Nellippallil,*** *University of Oklahoma, Norman, OK, USA,* ***Yan Yan, Guoxin Wang,*** *Beijing Institute of Technology, Beijing, China,* ***Chung Hyun Goh,*** *University of Texas, Tyler, TX, USA,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

ONTOLOGY-BASED REPRESENTATION OF META-DESIGN IN DESIGNING DECISION WORKFLOWS
Technical Paper Publication. DETC2017-67817

Ru Wang, Guoxin Wang, Yan Yan, *Beijing Institute of Technology, Beijing, China,* ***Maryam Sabeghi,*** *University of Oklahoma, OKC, OK, USA,* ***Zhenjun Ming,*** *Beijing Institute of Technology, Beijing, China,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

DAC-11-3: DESIGN OF ENGINEERING MATERIALS AND STRUCTURES 3

CONCOURSE LEVEL, ROOM 7 **10:00AM–11:40AM**

Session Organizer: **Guang Dong,** *Tesla, Tesla, CA, USA*

Session Co-Organizer: **James Guest,** *Johns Hopkins University, Lutherville Timonium, MD, USA*

IDENTIFICATION OF HIGH PERFORMANCE REGIONS OF HIGH-DIMENSIONAL DESIGN SPACES WITH MATERIALS DESIGN APPLICATIONS
Technical Paper Publication. DETC2017-67769

Clinton Morris, *The University of Texas at Austin, Austin, TX, USA,* ***Carolyn Seepersad,*** *University of Texas at Austin, Austin, TX, USA*

A GOAL-ORIENTED, INVERSE DECISION-BASED DESIGN METHOD TO ACHIEVE THE VERTICAL AND HORIZONTAL INTEGRATION OF MODELS IN A HOT ROD ROLLING PROCESS CHAIN
Technical Paper Publication. DETC2017-67570

Anand Balu Nellippallil, *University of Oklahoma, Norman, OK, USA,* ***Vignesh Rangaraj,*** *The University of Oklahoma, Norman, OK, USA,* ***Gautham Basavarsu,*** *Tata Research Development and Design Centre, Pune, India,* ***Amarendra Singh,*** *Indian Institute of Technology, Kanpur, Kanpur, India,* ***Janet Allen,*** *University of Oklahoma, Norman, OK, USA,* ***Farrokh Mistree,*** *University of Oklahoma, Norman, OK, USA*

TOPOLOGY OPTIMIZATION OF COMPONENTS WITH EMBEDDED OBJECTS USING DISCRETE OBJECT PROJECTION
Technical Paper Publication. DETC2017-68055

Saranthip Koh, *Johns Hopkins University, Baltimore, MD, USA,* ***James Guest,*** *Johns Hopkins University, Lutherville Timonium, MD, USA*

FORCE DIVERTING HELMET LINER ACHIEVED THROUGH A LATTICE OF MULTI-MATERIAL COMPLIANT MECHANISMS
Technical Paper Publication. DETC2017-67684

Vaibhav V. Gokhale, Prasad B. Tapkir, Andres Tovar, *Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA*

TOPOLOGY AND SIZING OPTIMIZATION OF MICROMIXERS USING GRAPH-THEORETICAL REPRESENTATION AND GENETIC ALGORITHM
Technical Paper Publication. DETC2017-67745

Mitsuo Yoshimura, Koji Shimoyama, Takashi Misaka, Shigeru Obayashi, *Institute of Fluid Science, Tohoku University, Sendai, Miyagi, Japan*

DAC-14-1: METAMODEL-BASED DESIGN OPTIMIZATION

CONCOURSE LEVEL, ROOM 6 **10:00AM–11:40AM**

Session Organizer: **Jie Zhang,** *University of Texas at Dallas, Richardson, TX, USA*

Session Co-Organizer: **Ali Mehmani,** *Columbia University, New York, NY, USA*

AERODYNAMIC AUTOMOBILE SHAPE OPTIMIZATION BY INCORPORATING REVERSE SHAPE DESIGN METHOD WITH CFD ANALYSIS

Technical Paper Publication. DETC2017-67175

Kisun Song, Kyung Hak Choo, Jung-Hyun Kim, Dimitri Mavris, *Georgia Institute of Technology, Atlanta, GA, USA*

PRODUCT BASED SEQUENCE EVALUATION FOR AUTOMATED ASSEMBLY PLANNING

Technical Paper Publication. DETC2017-68298

Weifeng Huang, Nima Rafibakhsh, Matthew Campbell, Christopher Hoyle, *Oregon State University, Corvallis, OR, USA*

OPTIMAL SURROGATE AND NEURAL NETWORK MODELING FOR DAY-AHEAD FORECASTING OF THE HOURLY ENERGY CONSUMPTION OF UNIVERSITY BUILDINGS

Technical Paper Publication. DETC2017-68350

Payam Ghassemi, Kaige Zhu, Souma Chowdhury, *University at Buffalo, Buffalo, NY, USA*

A MULTIOBJECTIVE ADAPTIVE SURROGATE MODELING-BASED OPTIMIZATION (MO-ASMO) FRAMEWORK USING EFFICIENT SAMPLING STRATEGIES

Technical Paper Publication. DETC2017-67541

Yong Hoon Lee, R. E. Corman, Randy H. Ewoldt, James Allison, *University of Illinois at Urbana-Champaign, Urbana, IL, USA*

INVESTIGATING GREY-BOX MODELING FOR PREDICTIVE ANALYTICS IN SMART MANUFACTURING

Technical Paper Publication. DETC2017-67794

Zhuo Yang, *University of Massachusetts at Amherst, Amherst, MA, USA,* ***Douglas Eddy,*** *University of Massachusetts Amherst, Amherst, MA, USA,* ***Sundar Krishnamurty,*** *University of Massachusetts-Amherst, Amherst, MA, USA,* ***Ian Grosse,*** *University of Massachusetts, Amherst, MA, USA,* ***Peter Denno, Paul Witherell, Yan Lu,*** *NIST, Gaithersburg, MD, USA*

DEC-3-1: EVALUATION AND ASSESSMENT FOR DESIGN EDUCATION

EXHIBIT HALL LEVEL, ROOM 23 **10:00AM–11:40AM**

Session Organizer: **Zhenghui Sha,** *University of Arkansas, Fayetteville, AR, USA*

Session Co-Organizer: **Kathryn Jablokow,** *Penn State University, Malvern, PA, USA*

TOWARDS THE DEVELOPMENT OF AN ELABORATION METRIC FOR CONCEPT SKETCHES

Technical Paper Publication. DETC2017-67375

Daniel Sevier, Seda McKilligan, Ian Baker, *Iowa State University, Ames, IA, USA,* ***Kathryn Jablokow,*** *Penn State University, Malvern, PA, USA,* ***Shanna Daly,*** *University of Michigan, Ann Arbor, MI, USA,* ***Eli Silk,*** *Rutgers University, New Brunswick, NJ, USA*

EDUCATION READINESS LEVELS (ERLS): A SCALE FOR ASSESSING EDUCATIONAL COURSEWORK AND TRAINING MODULES

Technical Paper Publication. DETC2017-68086

Shantanab Dinda, *The Pennsylvania State University, State College, PA, USA,* ***Timothy W. Simpson,*** *Penn State University, University Park, PA, USA,* ***Leanne Gluck,*** *America Makes, San Francisco, CA, USA*

CHALLENGES IN USING A DELPHI METHOD TO FORMALIZE CONCEPTUAL UNDERSTANDING IN FUNCTIONAL REASONING

Technical Paper Publication. DETC2017-68422

Michael J. Scott, *University of Illinois at Chicago, Chicago, IL, USA,* ***Margaret G. Allen,*** *Diksha Gaur, UIC, Chicago, IL, USA*

EXTENDING DESIGN HEURISTICS FROM MECHANICAL ENGINEERING TO A BIOMEDICAL PROJECTS COURSE

Technical Paper Publication. DETC2017-67795

Jin Woo Lee, Anastasia K. Ostrowski, Shanna Daly, Aileen Y. Huang-Saad, Colleen M. Seifert, *University of Michigan, Ann Arbor, MI, USA*

THE RELATIONSHIP BETWEEN FIXATION AND ORIGINALITY IN UNDERGRADUATE MECHANICAL ENGINEERING STUDENTS

Technical Paper Publication. DETC2017-67833

Alexander LeGendre, *University of Massachusetts Dartmouth, Dartmouth, MA, USA,* ***Trina Kershaw,*** *University of Massachusetts Dartmouth, North Dartmouth, MA, USA,* ***Rebecca Peterson,*** *University of Massachusetts Dartmouth, Dartmouth, MA, USA,* ***Sankha Bhowmick,*** *University of Massachusetts-Dartmouth, N Dartmouth, MA, USA*

DTM-1-3: CREATIVITY IDEATION III

EXHIBIT HALL LEVEL, ROOM 20 **10:00AM–11:40AM**

Session Organizer: **Christine Toh,** *University of Nebraska at Omaha, Omaha, NE, USA*

Session Co-Organizer: **Amaresh Chakrabarti,** *Indian Institute of Science, Bangalore, India*

INNOVATION OF MATCHING STRUCTURES THROUGH CLUSTERING AND RECONSTRUCTING BASIC OPERATION ACTIONS IN THE FORM LAYER
Technical Paper Publication. DETC2017-67307

Yu-Tong Li, *China University of Petroleum, Qingdao, China, Zhejiang University Yuquan District, Hangzhou, Zhejiang, China*

UNDERSTANDING EFFECTS OF ANALOGICAL DISTANCE ON PERFORMANCE OF IDEATION: KEY OBSERVATIONS AND FINDINGS
Technical Paper Publication. DETC2017-67752

Srinivasan Venkataraman, Binyang Song, Jianxi Luo, Subburaj Karupppasamy, Mohan Rajesh Elara, Lucienne Blessing, *Singapore University of Technology and Design, Singapore,* ***Kristin Wood,*** *Singapore University of Technology and Design, Singapore 487372, Singapore*

PROPOSAL OF DELTA DESIGN MAP BASED ON FUNCTION, BEHAVIOR, STRUCTURE AND USER EXPERIENCE FOR DESIGN IDEATION SUPPORT
Technical Paper Publication. DETC2017-68058

Tamotsu Murakami, *University of Tokyo, Tokyo 113, Japan,* ***Tomoyuki Koyanagi,*** *University of Tokyo, Tokyo, Japan*

MINING FOR CREATIVITY: DETERMINING THE CREATIVITY OF IDEAS THROUGH DATA MINING TECHNIQUES
Technical Paper Publication. DETC2017-68304

Christine Toh, *University of Nebraska at Omaha, Omaha, NE, USA,* ***Elizabeth Starkey,*** *Penn State, University Park, PA, USA,* ***Conrad Tucker,*** *Penn State University, State College, PA, USA,* ***Scarlett Miller,*** *The Pennsylvania State University, University Park, PA, USA*

MR-2-3: SINGULARITY ANALYSIS

EXHIBIT HALL LEVEL, ROOM 11 **10:00AM–11:40AM**

Session Co-Organizers: **Gordon Pennock,** *Mechanical Engineering, Purdue University, Indiana, IN, USA,* **Ronald Zimmerman II,** *Magna Seating, White Lake, MI, USA*

BRANCH RECONFIGURATION WITH BRICARD VARIATIONS BASED ON TOROIDS INTERSECTIONS: LINE-SYMMETRIC CASE.
Technical Paper Publication. DETC2017-68243

Pablo C. Lopez-Custodio, *King's College London, London, United Kingdom,* ***Jian Dai,*** *Kings College-University of London, London, United Kingdom,* ***Jose Rico,*** *Universidad de Guanajuato, Salamanca, Mexico*

SOME NEW RESULTS ON THE KINEMATICS OF 3R SERIAL ROBOTS USING NESTED DETERMINANTS
Technical Paper Publication. DETC2017-67706

Federico Thomas, *IRI (CSIC-UPC), Barcelona, Spain,* ***Maria Alba Perez Gracia,*** *Idaho State University, Pocatello, ID, USA*

APPLICATIONS OF CONSTRAINT GRAPHS AND ASSUR GROUPS IN MECHANISM ANALYSIS AND SYNTHESIS
Technical Paper Publication. DETC2017-67925

Elad Hahn, *Tel Aviv University, Tel Aviv, Israel,* ***Adnan Sljoka,*** *Kwansei Gakuin University, Osaka, Japan,* ***Andreas Mueller,*** *Johannes Kepler University, Institute of Robotics, Linz, Austria*

KINEMATIC CONSTRAINT MAPS, C-SPACE SINGULARITIES AND GENERALISED GRASHOF CONDITIONS
Technical Paper Publication. DETC2017-67649

S. Vahid Amirinezhad, Peter Donelan, *Victoria University of Wellington, Wellington, New Zealand*

KINEMATIC ANALYSIS OF MULTI-4-BAR MECHANISMS USING ALGEBRAIC GEOMETRY
Technical Paper Publication. DETC2017-67250

Samuli Piipponen, Eero Hyry, *University of Tampere, Tampere, Finland,* ***Teijo Arponen,*** *Vaisala Oy, Vantaa, Finland*

MR-3-2: INTERACTIVE SESSION

BALLROOM LEVEL, ROOM 25C **10:00AM–11:40AM**

Session Organizer: **Girish Krishnan,** *UIUC, Urbana, IL, USA*

Session Co-Organizer: **Charles Kim,** *Bucknell University, Lewisburg, PA, USA*

STRESS ANALYSIS OF A FIXED-FREE COMPLIANT SEGMENT USING THE PSEUDO-RIGID-BODY MODEL (PRBM) CONCEPT
Technical Paper Publication. DETC2017-68423

Joshua A. Crews, *GKN Aerospace – St. Louis, Hazelwood, MO, USA,* ***Ashok Midha,*** *Missouri University of Science and Technology, Rolla, MO, USA,* ***Lokeswarappa R. Dharani,*** *Missouri University of Science and Technology, Rolla, MO, USA*

STRESS ANALYSIS OF A METALLIC-REINFORCED, SMALL-LENGTH FLEXURAL PIVOT COMPLIANT SEGMENT USING THE PSEUDO-RIGID-BODY MODEL (PRBM)
Technical Paper Publication. DETC2017-68425

Joshua A. Crews, *GKN Aerospace – St. Louis, Hazelwood, MO, USA,* ***Ashok Midha,*** *Missouri University of Science and Technology, Rolla, MO, USA,* ***Lokeswarappa R. Dharani,*** *Missouri University of Science and Technology, Rolla, MO, USA*

PSEUDO-RIGID-BODY MODELS OF INITIALLY-CURVED AND STRAIGHT BEAMS FOR DESIGNING COMPLIANT MECHANISM
Technical Paper Publication. DETC2017-67431

Venkatasubramanian Kalpathy Venkiteswaran, Hai-Jun Su, *The Ohio State University, Columbus, OH, USA*

CONTINUUM KINEMATICS OF A PLANAR DUAL-BACKBONE ROBOT BASED ON PSEUDO-RIGID-BODY MODEL: FORMULATION, ACCURACY, AND EFFICIENCY
Technical Paper Publication. DETC2017-67853

Chin-Hsing Kuo, Yen-Chun Chen, Ta-Yu Pan, *National Taiwan University of Science and Technology, Taipei, Taiwan*

A RECONFIGURABLE COMPLIANT FOUR-BAR MECHANISM WITH MULTIPLE OPERATION MODES
Technical Paper Publication. DETC2017-67441

Abhilash Nayak, *IRCCyN, Nantes, France,* ***Haiyang Li, Guangbo Hao,*** *University College Cork, Cork, Ireland,* ***Stephane Caro,*** *IRCCYN, Nantes, France*

DYNAMIC MODELING AND OPTIMAL DESIGN OF A 2R COMPLIANT MECHANISM
Technical Paper Publication. DETC2017-68019

Wenshuo Ma, *Beihang University, Beijing, China,* ***Yan Xie,*** *Robotics Institute, Beihang University, Beijing, China,* ***Jingjun Yu,*** *Beihang University/Robotics Institute, Beijing, China,* ***Xu Pei,*** *Beihang University, Beijing, China*

A FRAMEWORK FOR ENERGY-BASED KINETOSTATIC MODELING OF COMPLIANT MECHANISMS
Technical Paper Publication. DETC2017-68205

Guimin Chen, Fulei Ma, Ruiyu Bai, *Xidian University, Xi'an, UT, USA,* ***Spencer P. Magleby,*** *Brigham Young University, Provo, UT, USA,* ***Larry L. Howell,*** *Brigham Young University, Provo, UT, USA*

SYNTHESIS OF SHAPE MORPHING CONTACT-AIDED COMPLIANT MECHANISMS
Technical Paper Publication. DETC2017-68248

Prabhat Kumar, *Indian Institute of Technology, Kanpur, India,* ***Anupam Saxena,*** *Indian Institute of Technology, Kanpur, India,* ***Roger A. Sauer,*** *AICES, RWTH Aachen University, Aachen, Germany*

CONCENTRIC HELICAL AXIAL SPRING TUNABLE STIFFNESS MECHANISM: ANALYTICAL MODELING, DESIGN OPTIMIZATION AND EXPERIMENTAL VALIDATION
Technical Paper Publication. DETC2017-67677

Zeeshan Qaiser, *UM-SJTU Joint Institute, Shanghai, China,* ***Shane Johnson,*** *UM-SJTU Joint Institute, Shanghai Jiao Tong University, Shanghai, China,* ***Liping Kang,*** *UM-SJTU Joint Institute, Shanghai, China*

AN ANALYTICAL MODEL FOR BEAM FLEXURE MODULES BASED ON THE TIMOSHENKO BEAM THEORY
Technical Paper Publication. DETC2017-67512

Mohammad Hussein Kahrobaiyan, *Ecole Polytechnique Fédérale De Lausanne (EPFL), Neuchâtel, Neuchâtel, Switzerland,* ***Mohamed Zanaty, Simon Henein,*** *Instant-Lab, EPFL, Neuchatel, Switzerland*

KINETOSTATICS MODELING AND DECOUPLING ANALYSIS OF A CROSSHAIR FLEXURES BASED NANOPOSITIONER
Technical Paper Publication. DETC2017-68097

Pengbo Liu, Songsong Lu, Peng Yan, *Shandong University, Jinan, Shandong, China,* ***Zhen Zhang,*** *Tsinghua University, Beijing, China*

MR-6-2: LEGGED LOCOMOTION

[Cross-listed with MSNDC-16]

EXHIBIT HALL LEVEL, ROOM 10 **10:00AM–11:40AM**

Session Organizer: **Philip Voglewede,** *Marquette University, Milwaukee, WI, USA*

Session Co-Organizer: **Stephen Canfield,** *Tennessee Technological University, Cookeville, TN, USA*

EXPERIMENTAL VALIDATION OF UNLUMPED MODEL AND ITS DESIGN IMPLICATIONS FOR ROTARY SERIES ELASTIC ACTUATORS
Technical Paper Publication. DETC2017-68074

Jeong Hwan Yoon, *Apt 201, Los Angeles, CA, USA,* ***Daniel Sun, Vidur Sanandan,*** *UCLA, Los Angeles, CA, USA,* ***Dennis Hong,*** *University of California, Los Angeles, Los Angeles, CA, USA*

CONTACT-DEPENDENT BALANCE STABILITY OF WALKING ROBOTS
Technical Paper Publication. DETC2017-68272

Carlotta Mummolo, William Peng, Carlos Gonzalez, Joo H. Kim, *New York University, Brooklyn, NY, USA*

APPLICATION KINETIC ENERGY SHAPING TO CONTROLLING AND ANTI CONTROLLING CHAOTIC GAIT OF UNDERACTUATED COMPASS-GAIT BIPEDAL ROBOT
Technical Paper Publication. DETC2017-67754

Jin Xie, *Southwest Jiaotong University, Chengdu, Sichuan, China,* ***Bowen Sun,*** *Xi'an High-Speed Railway Depot, Xi'an, Shaanxi, China,* ***Wei Wei, Zhaohui Liu,*** *Southwest Jiaotong University, Chengdu, Sichuan, China*

VELOCITY/FORCE CAPACITIES OF A SIX-LEGGED WALKING MACHINE
Technical Paper Publication. DETC2017-67543

Yuan Tian, Feng Gao, Jimu Liu, *Shanghai Jiao Tong University, Shanghai, China*

KINEMATIC ANALYSIS OF LEGGED MOBILE MANIPULATOR
Technical Paper Publication. DETC2017-67412

Kondalarao Bhavanibhatla, Dilip K. Pratihar, *Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India*

MNS-2-3: NONLINEAR RESONANT DEVICES, PARAMETRIC OSCILLATORS

[Cross-listed with VIB-12]

EXHIBIT HALL LEVEL, ROOM 13 **10:00AM–11:40AM**

Session Organizer: **Najib Kacem,** *University Bourgogne Franche-Comte, Besançon, France*

Session Co-Organizer: **Shahrzad Towfighian,** *Binghamton University, Binghamton, NY, USA*

PARAMETRIC EXCITATION OF A REPULSIVE FORCE ACTUATOR
Technical Paper Publication. DETC2017-67381

Mark Pallay, Shahrzad Towfighian, *Binghamton University, Binghamton, NY, USA*

MULTISTABILITY AND BIFURCATION TOPOLOGY IN ELECTROSTATICALLY COUPLED NANOBEAMS UNDER PARAMETRIC RESONANCE
Technical Paper Publication. DETC2017-67588

Diala Bitar, *Univ. Bourgogne Franche-Comte, FEMTO-ST Institute, Besancon, France,* ***Najib Kacem,*** *Univ. Bourgogne Franche-Comte, Besançon, France,* ***Noureddine Bouhaddi,*** *Univ. Bourgogne Franche-Comte, FEMTO-ST Institute, Besancon, France*

AXIALLY MODULATED CLAMPED-GUIDED ARCH RESONATOR FOR MEMORY AND LOGIC APPLICATIONS
Technical Paper Publication. DETC2017-68284

Md Abdullah Al Hafiz, *King Abdullah University of Science and Technology, Thuwal, Makkah Province, Saudi Arabia,* ***Sherif Tella, Nouha Alcheikh, Hossein Fariborzi,*** *King Abdullah University of Science and Technology, Jeddah, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

NUMERICAL INVESTIGATION OF MODAL AMPLITUDE SATURATION IN MICROMECHANICAL CANTILEVER BEAM RESONATORS
Technical Paper Publication. DETC2017-67720

Tianyi Zhang, Zhuangde Jiang, Xueyong Wei, *Xi'an Jiaotong University, Xi'an, China*

NONLINEAR DYNAMIC RESPONSES OF AN OPTOMECHANICAL RESONATOR WITH CIRCULAR AIR-HOLES
Technical Presentation. DETC2017-67749

Feng-Rui Liu, Wen-Ming Zhang, Han Yan, *Shanghai Jiao Tong University, Shanghai, China*

MNS-3-1: MNS-3 BIO MEMS/NEMS

EXHIBIT HALL LEVEL, ROOM 22 **10:00AM–11:40AM**

Session Organizer: **Brian Jensen,** *Brigham Young University, Provo, UT, USA*

DOUBLE-LAYER NERVE GUIDE CONDUIT WITH PALISADE POLY (LACTIC-CO-GLYCOLIC ACID) TUBE WRAPPED BY MICROPOROUS CHITOSAN-COLLAGEN COMPOSITE
Technical Paper Publication. DETC2017-67109

Ching-Wen Li, *National Chung-Hsing University, Taichung, Taiwan,* ***Gou-Jen Wang,*** *National Chung Hsing University, Taichung 40227, Taiwan*

THREE-DIMENSIONAL BIOMIMETIC BIOSENSORS FOR FOOD SAFETY APPLICATIONS
Technical Paper Publication. DETC2017-67446

Mohammad Shavezipur, *Southern Illinois University, Edwardsville, Edwardsville, IL, USA,* ***Brian Huffman, Roya Mazrouei, Joseph Bevelheimer,*** *Southern Illinois University, Edwardsville, IL, USA*

DETECTION OF THE MITOCHONDRIAL DNA 8-HYDROXY-2'-DEOXYGUANOSINE MUTATIONS VIA FLUORESCENCE RESONANCE ENERGY TRANSFER
Technical Presentation. DETC2017-68476

Gou-Jen Wang, *National Chung Hsing University, Taichung 40227, Taiwan,* ***Ching-Wen Li, Chien-Hui Su, Cheng-Chung Chang,*** *National Chung-Hsing University, Taichung, Taiwan*

ON ELECTROSTATICALLY ACTUATED MEMS RESONATOR BIO-SENSORS
Technical Presentation. DETC2017-68483

Dumitru Caruntu, Christian Reyes, *University of Texas Rio Grande Valley, Edinburg, TX, USA*

MEASUREMENT OF NANOINJECTION DELIVERY THROUGH RADIOTAGGED DNA AND ENUCLEATION
Technical Presentation. DETC2017-68527

Nicholas Gregory, Nelson Warner, Brad Hanks, Brian Jensen, Sandra Hope, *Brigham Young University, Provo, UT, USA*

MSNDC-1-1: FLUID-STRUCTURE INTERACTION

BALLROOM LEVEL, ROOM 26B **10:00AM–11:40AM**

Session Organizer: **Johannes Gerstmayr,** *Leopold-Franzens University Innsbruck, Innsbruck, Austria*

Session Co-Organizer: **Phanindra Tallapragada,** *Clemson University, Clemson, SC, USA*

NUMERICAL MODELING AND ANALYSIS OF PISTON LUBRICATION FOR FLEXIBLE BODIES THROUGH ELASTONHYDRODYNAMICS AND MODAL REDUCTION METHOD
Technical Paper Publication. DETC2017-67299

Seongsu Kim, Juhwan Choi, *Functionbay, Inc., Gyeonggi-Do, Korea (Republic),* ***Sungsoo Rhim, Jin Hwan Choi,*** *KyungHee University, Kyunggi-do 449 701, Korea (Republic)*

A PARTITIONED LAGRANGIAN-LAGRANGIAN APPROACH FOR FLUID-SOLID INTERACTION PROBLEMS
Student Competition Paper. DETC2017-68206

Milad Rakhsha, *University of Wisconsin, Madison, WI, USA,* ***Arman Pazouki,*** *California State University, Los Angeles, Los Angeles, CA, USA,* ***Radu Serban,*** *University of Wisconsin Madison, Madison, WI, USA,* ***Dan Negrut,*** *University of Wisconsin, Madison, WI, USA*

STUDY ON DYNAMIC BEHAVIORS OF LIQUID-FILLED FLEXIBLE MULTIBODY SYSTEMS IN A LOW-GRAVITY ENVIRONMENT
Technical Presentation. DETC2017-68471

Weizhen Kong, Qiang Tian, *Beijing Institute of Technology, Beijing, China*

CONSISTENT MULTI-RESOLUTION SPH WITH SECOND-ORDER ACCURACY
Technical Presentation. DETC2017-68474

Wei Hu, *Beijing Institute of Technology, Beijing, China*

MSNDC-3-2: FLEXIBLE MULTIBODY DYNAMICS – 2

BALLROOM LEVEL, ROOM 26C **10:00AM–11:40AM**

Session Organizer: **Hiroyuki Sugiyama,** *The University of Iowa, Iowa City, IA, USA*

Session Co-Organizer: **Grzegorz Orzechowski,** *Lappeenranta University of Technology, Lappeenranta, Finland*

COMPARISON OF FULLY PARAMETERIZED AND GRADIENT DEFICIENT ELEMENTS IN THE ABSOLUTE NODAL COORDINATE FORMULATION
Technical Paper Publication. DETC2017-67734

Johannes Gerstmayr, *Leopold-Franzens University Innsbruck, Innsbruck, Austria,* ***Peter Gruber,*** *Linz Center of Mechatronics, Linz, Austria,* ***Alexander Humer,*** *Johannes Kepler University, Linz, Austria*

PARALLEL TIME-INTEGRATION OF FLEXIBLE MULTIBODY DYNAMICS BASED ON NEWTON-WAVEFORM METHOD
Technical Paper Publication. DETC2017-68232

Shilei Han, *University of Maryland, College Park, MD, USA,* ***Olivier Bauchau,*** *University of Maryland, College Park, Maryland 20742, MD, USA*

EHD LUBRICATED SPHERICAL JOINT MODEL FOR RIGID-FLEXIBLE MULTIBODY DYNAMICS
Technical Presentation. DETC2017-67736

Jie Lou, Qiang Tian, *Beijing Institute of Technology, Beijing, Beijing, China*

MSNDC-7-1: NONLINEAR ROTORDYNAMICS AND ROTATING SYSTEMS

[Cross-listed with VIB-8]

BALLROOM LEVEL, ROOM 25A **10:00AM–11:40AM**

Session Organizer: **Olivier Bauchau,** *University of Maryland, College Park, Maryland 20742, MD, USA*

Session Co-Organizer: **Han Shilei,** *University of Maryland, College Park, MD, USA*

NONLINEAR NUMERICAL INVESTIGATION AROUND INSTABILITY POINT OF THE FLEXIBLE ROTOR SUPPORTED BY THE JOURNAL BEARING
Technical Paper Publication. DETC2017-67715

Mugen Ito, *Nagoya University, Nagoya, Japan,* ***Tsuyoshi Inoue,*** *Nagoya University, Chikusa-Ku Nagoya, Japan*

APPLICATION OF THE POD METHOD FOR CRACKED ROTORS
Technical Paper Publication. DETC2017-68255

Ayesha Almehairi, Mohammad Al-Shudeifat, Adnan Saeed, Shadi Balawi, *Khalifa University, Abu Dhabi, United Arab Emir*

EFFECT OF UNBALANCE FORCE DIRECTION ON A CRACKED ROTOR WHIRL RESPONSE
Technical Paper Publication. DETC2017-68261

Hanan Al Hosani, Mohammad Al-Shudeifat, Adnan Saeed, Shadi Balawi, *Khalifa University, Abu Dhabi, United Arab Emir*

MULTIBODY MODELLING AND EXPERIMENTAL INVESTIGATION OF TURBOCHARGER DYNAMICS
Technical Presentation. DETC2017-68503

Michal Hajžman, Lubos Smolík, Miroslav Byrtus, Pavel Polach, *University of West Bohemia, Plzen, Czech Republic*

PTG-4-2: GEARBOX DESIGN, RELIABILITY, AND DIAGNOSTICS (2)

EXHIBIT HALL LEVEL, ROOM 15 **10:00AM–11:40AM**

Session Organizer: **Geng Liu,** *Northwestern Polytechnical University, Xi'an, Shannxi, China*

Session Co-Organizer: **Richard Dippery, Jr,** *Retired, Flint, MI, USA*

PLANETARY LOAD SHARING IN THREE-POINT- MOUNTED WIND TURBINE GEARBOXES: A DESIGN AND TEST COMPARISON
Technical Presentation. DETC2017-68517

Yi Guo, Jon Keller, *National Renewable Energy Laboratory, Golden, CO, USA,* ***Zhiwei Zhang,*** *Romax Wind, Boulder, CO, USA,* ***Doug Lucas,*** *Timken, North Canton, OH, USA*

JMR MAIN ROTOR GEARBOX CASE STUDY: LEVERAGING GEOMETRY OPTIMIZATION TOOLS TO REDUCE DEVELOPMENT COST, SCHEDULE AND WEIGHT OF ROTORCRAFT DRIVE SYSTEMS
Technical Presentation. DETC2017-67919

Scott Bouwer, David Bowen, *The Boeing Company, Ridley Park, PA, USA*

COPULA-BASED TIME-FREQUENCY DISTRIBUTION ANALYSIS FOR PLANETARY GEARBOX FAULT DETECTION
Technical Paper Publication. DETC2017-68060

Libin Liu, *University of Alberta, Edmonton, AB, Canada,* ***Ming Jian Zuo,*** *University of Alberta, Edmonton, AB, Canada*

PTG-6-2: LUBRICATION AND EFFICIENCY (2)

EXHIBIT HALL LEVEL, ROOM 16 **10:00AM–11:40AM**

Session Organizer: **Yuanxin Luo,** *Chongqing University, Chongqing, China*

Session Co-Organizer: **David Talbot,** *Ohio State University | OSU, Columbus, OH, USA*

FRICTION TORQUE MODELLING AND EFFICIENCY ANALYSIS OF THE PRELOADED INVERTED PLANETARY ROLLER SCREW MECHANISM
Technical Paper Publication. DETC2017-68006

Guan Qiao, Geng Liu, Shangjun Ma, *Northwestern Polytechnical University, Xi'an, Shannxi, China,* ***Zhenghong Shi,*** *University of Cincinnati, Cincinnati, OH, USA,* ***Teik Lim,*** *The University of Texas at Arlington, Fort Worth, TX, USA*

FRICTION AND WEAR PROPERTIES OF HALOGEN-FREE AND HALOGEN-CONTAINING IONIC LIQUIDS USED AS NEAT LUBRICANTS, LUBRICANT ADDITIVES AND THIN LUBRICANT LAYERS
Technical Paper Publication. DETC2017-67971

Hong Guo, Rui Liu, Alfonso Fuentes-Aznar, Patricia Iglesias Victoria, *Rochester Institute of Technology, Rochester, NY, USA*

BASELINE EXPERIMENTAL RESULTS ON THE EFFECT OF OIL TEMPERATURE ON SHROUDED MESHED SPUR GEAR WINDAGE POWER LOSS
Technical Paper Publication. DETC2017-67818

Irebert Delgado, *NASA Glenn Research Center, Cleveland, OH, USA,* ***Mike Hurrell,*** *HX5 Sierra, LLC / TFOME II, Cleveland, OH, USA*

AN EXPERIMENTAL INVESTIGATION OF CHURNING POWER LOSSES OF A GEARBOX
Technical Paper Publication. DETC2017-68345

Joseph Polly, *The Ohio State University, Columbus, OH, USA,* ***David Talbot,*** *Ohio State University | OSU, Columbus, OH, USA,* ***Ahmet Kahraman,*** *Ohio State University, Columbus, OH, USA,* ***Avinash Singh,*** *General Motors, Sterling Heights, MI, USA,* ***Hai Xu,*** *General Motors Company, Milford, MI, USA*

EFFECTIVITY OF PARTICLE METHOD TO ANALYZE OIL BATH LUBRICATED GEAR PAIR
Technical Presentation. DETC2017-68539

Shigeki Matsumura, *Tokyo Institute of Technology, Yokohama, Japan*

VIB-4-2: NONLINEAR SYSTEMS AND PHENOMENA II

[Cross-listed with MSNDC-5]

BALLROOM LEVEL, ROOM 25B **10:00AM–11:40AM**

Session Organizer: **Stefano Lenci,** *Polytechnic University of Marche, Ancona, Italy*

FREQUENCY-ENERGY DEPENDANCE OF THE BISTABLE NONLINEAR ENERGY SINK
Technical Paper Publication. DETC2017-67780

Mohammad Al-Shudeifat, Adnan Saeed, *Khalifa University, Abu Dhabi, United Arab Emir.*

NONLINEAR ANALYSIS OF A PLANAR BEAM SYSTEM BY FINITE ELEMENT METHOD
Technical Presentation. DETC2017-68479

Stefano Lenci, *Polytechnic University of Marche, Ancona, Italy,* ***Lukasz Kloda,*** *Polytechnic University of Marche, Ancona, Italy,* ***Jerzy Warminski,*** *Lublin University of Technology, Lublin, Poland*

NON-RECIPROCITY IN STRUCTURES WITH NONLINEAR INTERNAL HIERARCHY AND ASYMMETRY
Student Competition Paper. DETC2017-67965

Matthew D. Fronk, *Georgia Institute of Technology, Atlanta, GA, USA,* ***Sameh Tawfick,*** *University of Illinois, Urbana, IL, USA,* ***Chiara Daraio,*** *California Institute of Technology, Pasadena, CA, USA,* ***Alexander Vakakis,*** *University of Illinois, Urbana, IL, USA,* ***Michael J. Leamy,*** *Georgia Institute of Technology, Atlanta, GA, USA*

ANGULAR POSITIONING AND VIBRATION CONTROL OF A SLEWING FLEXIBLE CONTROL BY APPLYING SMART MATERIALS AND SLIDING MODES CONTROL
Technical Paper Publication. DETC2017-68181

Frederic Conrad Janzen, *Federal University of Technology – Parana, Ponta Grossa, Parana, Brazil,* ***Jose Manoel Balthazar,*** *Aeronautics Technological Institute, São José dos Campos, Brazil,* ***Angelo M. Tusset, Rodrigo Tumolin Rocha,*** *Federal University of Technology – Parana, Ponta Grossa, Parana, Brazil,* ***Jeferson Jose de Lima,*** *Sao Paulo State University, Sao Paulo, Brazil*

ON THE NONLINEAR VIBRATION ANALYSIS OF ULTRA PRECISION MANUFACTURING MACHINES WITH MODE COUPLING
Technical Paper Publication. DETC2017-68331

Mohammad Bukhari, Oumar Barry, *Central Michigan University, Mt pleasant, MI, USA*

CIE-10-2: HUMAN MODELING: METHODS AND APPLICATIONS IN ENGINEERING II

CONCOURSE LEVEL, ROOM 4 **1:15PM–2:55PM**

Session Organizer: **James Yang,** *Texas Tech, Lubbock, TX, USA*

V4PCS: VOLUMETRIC 4PCS ALGORITHM FOR GLOBAL REGISTRATION
Technical Paper Publication. DETC2017-67452

Jida Huang, *University at Buffalo, Buffalo, NY, USA,* ***Tsz Ho Kwok,*** *Univ. of Southern California, Los Angeles, CA, USA,* ***Chi Zhou,*** *University at Buffalo, Amherst, NY, USA*

COMPARISON OF FATIGUE BEHAVIORS OF SPINAL IMPLANTS UNDER PHYSIOLOGICAL SPINAL LOADS: A FINITE ELEMENT PILOT STUDY
Technical Paper Publication. DETC2017-67783

Ming Xu, *Texas Tech University, Lubbock, TX, USA,* ***James Yang,*** *Texas Tech, Lubbock, TX, USA,* ***Isador Lieberman,*** *Texas Back Institute, Plano, TX, USA,* ***Ram Haddas,*** *Texas Back Institute Research Foundation, Plano, TX, USA*

ANTERIOR CRUCIATE LIGAMENT (ACL) INJURY: A LITERATURE REVIEW
Technical Paper Publication. DETC2017-67801

Jazmin Aguilar, *Texas Tech University, Lubbock, TX, USA,* ***James Yang,*** *Texas Tech, Lubbock, TX, USA*

SQUAT LIFTING MOTION PREDICTION WITH HEAVY LOAD CONSIDERING DYNAMIC STRENGTH OF KNEE JOINT
Technical Paper Publication. DETC2017-67933

Rahid Zaman, *University of Alaska Fairbanks, Fairbanks, AK, USA,* ***Yujiang Xiang,*** *University of Alaska-Fairbanks, Fairbanks, AK, USA*

DESIGN AND DEVELOPMENT OF 5-AXIS CRANIAL IMPLANT LASER CUTTING SYSTEM
Technical Paper Publication. DETC2017-68064

Joshua Liu, Jerry Fang, *Johns Hopkins University, Baltimore, MD, USA,* ***Ryan Murphy,*** *Johns Hopkins Applied Physics Laboratory, Laurel, MD, USA,* ***Chad Gordon,*** *Johns Hopkins School of Medicine, Baltimore, MD, USA,* ***Mehran Armand,*** *Johns Hopkins Applied Physics Laboratory/Johns Hopkins University, Baltimore, MD, USA*

CIE-16-2: KNOWLEDGE CAPTURE, REUSE AND MANAGEMENT II

CONCOURSE LEVEL, ROOM 5 **1:15PM–2:55PM**

Session Organizer: **David C. Jensen,** *University of Arkansas, Fayetteville, AR, USA*

Session Co-Organizer: **Ian Grosse,** *University of Massachusetts, Amherst, MA, USA*

EVALUATING SAMPLING METHODS FOR REUSING KNOWLEDGE FROM LARGE AND ILL-STRUCTURED QUALITATIVE DATA SETS
Technical Paper Publication. DETC2017-67964

Jacob Nelson, G. Austin Marrs, Greg Schmidt, *James Madison University, Harrisonburg, VA, USA,* ***Joseph Donndelinger,*** *Baylor University, Waco, TX, USA,* ***Robert Nagel,*** *James Madison University, Harrisonburg, VA, USA*

STRUCTURING INFORMATION OF MODULAR PRODUCT PLATFORMS
Technical Paper Publication. DETC2017-68024

Elisabeth Schrey, *RWTH Aachen University, Aachen, Germany,* ***Guenther Schuh,*** *Laboratory for Machine Tools and Production Engineering WZL, Aachen, Germany,* ***Michael Riesener, Merle-Hendrikje Jank,*** *RWTH Aachen University, Aachen, Germany*

AN IMPROVED NAIVE BAYESIAN CLASSIFIER FOR SEMI-AUTOMATICALLY GENERATING R&D KNOWLEDGE MAP OF COMPLEX PRODUCT BASED ON MUTUAL INFORMATION
Technical Paper Publication. DETC2017-68179

Zhou Jianhui, *Beihang University, Beijing, China,* ***Yang Haicheng,*** *China Aerospace Science and Technology Corporation, Beijing, China,* ***Liu Jihong,*** *Beihang University, Beijing, China*

WHY OPEN SOURCE? EXPLORING THE MOTIVATIONS OF USING AN OPEN MODEL FOR HARDWARE DEVELOPMENT
Technical Paper Publication. DETC2017-68195

Zhuoxuan Li, *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Warren Seering,*** *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Joshua Ramos,*** *Massachusetts Institute of Technology, Cambridge, MA, USA,* ***Maria Yang, David Wallace,*** *MIT, Cam-bridge, MA, USA*

IMPACT OF CHAINING METHOD AND LEVEL OF COMPLETION ON ACCURACY OF FUNCTION STRUCTURE-BASED MARKET PRICE PREDICTION MODELS
Technical Paper Publication. DETC2017-68451

Amaninder Gill, *Clemson University, Clemson, SC, USA,* ***Joshua Summers,*** *Clemson University, South Carolina, SC, USA*

ONTOLOGY MODEL FOR MECHANICAL SYSTEM REPRESENTATION
Poster Paper Presentation. DETC2017-68496

Amol Joshi, *TCS, Pune, Maharashtra, India,* ***Sreedhar Reddy,*** *Tata Consultancy Services Limited, Pune, Maharashtra, India,* ***Gautham Basavarsu,*** *Tata Research Development and Design Centre, Pune, India,* ***Prasenjit Das,*** *Tata Consultancy Services, Pune, Maharashtra, India*

DFMLC-6-1: EMERGING DESIGN FOR X (QUALITY, RELIABILITY, COST, MAINTAINABILITY, ETC)

EXHIBIT HALL LEVEL, ROOM 21 **1:15PM–2:55PM**

Session Organizer: **Sara Behdad,** *University at Buffalo, SUNY, New York, United Kingdom*

Session Co-Organizer: **Scott Ferguson,** *North Carolina State University, North Carolina, NC, USA*

PROCESS DESIGN AND CONTROL METHOD OF LASER VIA HOLE DRILLING OF PRINTED WIRING BOARDS BASED ON HIGH SPEED CAMERA MONITOR
Technical Paper Publication. DETC2017-67223

Koji Kanki, *Doshisha University, Kyotanabe-shi, Kyoto, Japan,* ***Toshiki Hirogaki, Eiichi Aoyama,*** *Doshisha University, Kyotanabe, Kyoto, Japan,* ***Keiji Ogawa,*** *Ryukoku University, Tokyto, Japan*

FABRICATION OF COMPLEX-SHAPE PRODUCTS FROM A BINDER-FREE GREEN COMPOSITE USING BAMBOO FIBERS AND POWDERS EXTRACTED WITH A MACHINING CENTER
Technical Paper Publication. DETC2017-67481

Kota Inoue, Antoine Bigeard, *Doshihsa University, Kyotanabe-shi, Kyoto, Japan,* T***oshiki Hirogaki, Eiichi Aoyama,*** *Doshisha University, Kyotanabe, Kyoto, Japan,* ***Keiji Ogawa,*** *Ryukoku University, Tokyto, Japan,* ***Hiromichi Nobe,*** *Mifuji Kikai Seisakusho Inc., Tatebayahsi-shi, Gunma, Japan*

UTILIZING DESIGN FOR ASSEMBLY PRINCIPLES TO PREDICT PRODUCT RECYCLABILITY
Technical Paper Publication. DETC2017-67950

Darshan Yadav, Deep Patel, *Florida Institute of Technology, Melbourne, FL, USA,* ***Beshoy Morkos,*** *Florida Institute of Technology, Florida, FL, USA*

UNCOVERING HIDDEN COSTS IN R&D OUTSOURCING: A CASE STUDY
Technical Paper Publication. DETC2017-68098

Richard Gruszewski, Bruce H. Smith, Donald E. Thresh, James Van Bortel, Marcos Esterman, *Rochester Institute of Technology, Rochester, NY, USA*

A CASE STUDY OF EVOLVABILITY AND EXCESS ON THE B-52 STRATOFORTRESS AND F/A-18 HORNET
Technical Paper Publication. DETC2017-68287

Daniel Long, *North Carolina State University, Raleigh, NC, USA,* ***Scott Ferguson,*** *North Carolina State University, North Carolina, NC, USA*

DFMLC-10-1: DESIGN OF SUSTAINABLE ENERGY SYSTEMS

EXHIBIT HALL LEVEL, ROOM 22 **1:15PM–2:55PM**

Session Organizer: **Joseph Piacenza,** *California State University Fullerton, California, CA, USA*

Session Co-Organizer: **Amin Mirkouei,** *University of Idaho, Idaho Falls, ID, ID, USA*

OPTIMIZATION OF WIND TURBINE BLADES CONSIDERING THE SPECIFIC WINDS

Technical Paper Publication. DETC2017-67423

Yuqiao Zheng, Zhe He, Yongyong Cao, *lanzhou University of Technical, lanzhou, Gansu, China,* ***Chengcheng Zhang,*** *Lanzhou University of Technology, lanzhou, China*

UNDERSTANDING THE IMPORTANCE OF POST OCCUPANCY USAGE TRENDS DURING CONCEPT-STAGE SUSTAINABLE BUILDING DESIGN

Technical Paper Publication. DETC2017-67461

Joseph Piacenza, *California State University Fullerton, California, CA, USA,* ***Salvador Mayoral, Bahaa Albarhami, Sean Lin,*** *California State University Fullerton, Fullerton, CA, USA*

DEMYSTIFYING THE RELATIONSHIP BETWEEN USE-PHASE ATTRIBUTES AND ENERGY CONSUMPTION: A CASE STUDY OF PERSONAL COMPUTERS

Technical Paper Publication. DETC2017-67825

Ardeshir Raihanian Mashhadi, *University at Buffalo, State University of New York, Amherst, NY, USA,* ***Sara Behdad,*** *University at Buffalo, SUNY, New York, United Kingdom*

UNDERSTANDING THE IMPACT OF CLIMATE ZONES FOR OCCUPANCY TRENDS IN SUSTAINABLE HOUSING DESIGNS

Technical Paper Publication. DETC2017-67897

Sean Lin, Bahaa Albarhami, Salvador Mayoral, *California State University Fullerton, Fullerton, CA, USA,* ***Joseph Piacenza,*** *California State University Fullerton, California, CA, USA*

ENHANCE SUSTAINABILITY BENEFITS THROUGH SCALING-UP BIOENERGY PRODUCTION FROM TERRESTRIAL AND ALGAE FEEDSTOCKS

Technical Paper Publication. DETC2017-67014

Amin Mirkouei, *University of Idaho, Idaho Falls, ID, ID, USA,* ***Kamran Kardel,*** *Georgia Southern University, Statesboro, GA, USA*

DTM-14-1: NEW AND EMERGING TRENDS IN DESIGN THEORY

EXHIBIT HALL LEVEL, ROOM 20 **1:15PM–2:55PM**

Session Organizer: **Gregory Mocko,** *Clemson University, Clemson, SC, USA*

Session Co-Organizer: **Maria Yang,** *MIT, Cambridge, MA, USA*

INTRINSICALLY ACTIVATING DESIGN

Technical Presentation. DETC2017-68469

Shuichi Fukuda, *Keio University, Musashino, Tokyo, Japan*

GAMING METHODS FOR COLLECTIVE SYSTEMS DESIGN THEORY

Technical Presentation. DETC2017-68500

Paul T. Grogan, *Stevens Institute of Technology, Hoboken, NJ, USA*

A NEW FUNDING OPPORTUNITY FOR DESIGN RESEARCHERS–REMADE

Technical Presentation. DETC2017-68520

Deborah Thurston, *University of Illinois at Urbana-Champaign, Chicago, CA, USA*

IMPLICATIONS OF DATA-DRIVEN MODELS FOR DESIGN THEORY AND METHODOLOGY

Technical Presentation. DETC2017-68521

Mark D. Fuge, *University of Maryland, College Park, College Park, MD, USA*

DESIGN AND FABRICATION METHODOLOGY FOR CUSTOMIZABLE, MULTI-MATERIAL PROSTHETIC HANDS FOR CHILDREN

Technical Presentation. DETC2017-68528

Daniel Lim, *University of California, Berkeley, Berkeley, CA, USA,* ***Adam Hutz,*** *University of California, Berkeley, El Cerrito, CA, USA,* ***Euiyoung Kim, Alice Agogino,*** *University of California, Berkeley, Berkeley, CA, USA*

HOW THINGS CHANGE: A COMPARISON OF CUSTOMER ENVIRONMENTAL AND SAFETY EVALUATIONS OF VEHICLE SILHOUETTES NOW AND SEVEN YEARS AGO

Technical Presentation. DETC2017-68535

Tahira Reid, Youyi Bi, *Purdue University, West Lafayette, IN, USA*

COMPARING THE VALIDITY AND UTILITY OF CREATIVITY METRICS IN ENGINEERING DESIGN RESEARCH

Technical Presentation. DETC2017-68567

Scarlett Miller, Sam Hunter, *The Pennsylvania State University, University Park, PA, USA,* ***Elizabeth Starkey,*** *Penn State, University Park, PA, USA,* ***Alex McKay,*** *The Pennsylvania State University, University Park, PA, USA*

MR-1-5: SYNTHESIS AND ANALYSIS

EXHIBIT HALL LEVEL, ROOM 9 **1:15PM–2:55PM**

Session Organizer: **Andreas Mueller,** *Johannes Kepler University, Institute of Robotics, Linz, Austria*

Session Co-Organizer: **Jian Dai,** *Kings College-University of London, London, United Kingdom*

EQUIVALENT FIVE-BAR LINKAGES FOR THE SINGULARITY ANALYSIS OF TWO-DOF SEVEN-BAR LINKAGES

Technical Paper Publication. DETC2017-67527

Jun Wang, *Hubei University of Technology, Wuhan, China,* ***Liangyi Nie,*** *Hubei University of Technology, Hubei, China,* ***Kwun-Lon Ting,*** *Tennessee Technological University, Cookeville, TN, USA,* ***Daxing Zhao, Jun Ren, Quan Wang, Jinfeng Sun,*** *Hubei University of Technology, Hubei, China*

ON OFFER SHAI'S CONTRIBUTION TO MECHANICAL ENGINEERING AND DESIGN
Technical Paper Publication. DETC2017-67549

Yoram Reich, Elad Hahn, *Tel Aviv University, Tel Aviv, Israel,* ***Michael Slavutin,*** *Tel-Aviv University, Tel-Aviv, Israel*

THE ASME MECHANISMS AND ROBOTICS CONFERENCES AN OVERVIEW OF SIXTY-FOUR YEARS OF SUCCESS
Technical Paper Publication. DETC2017-68229

Gordon Pennock, *Mechanical Engineering, Purdue University, Indiana, IN, USA,* ***Jian Dai,*** *Kings College-University of London, London, United Kingdom*

A FLEXIBLE DISCRETE BUILDING BLOCK SYNTHESIS APPROACH AS BASIS FOR THE DESIGN OF PLANAR LINKAGES
Technical Paper Publication. DETC2017-67832

Simon Laudahn, Franz Irlinger, Kassim Abdul-Sater, *Technical University of Munich, Garching, Germany*

DOUBLE CIRCULAR-ARC TOOTH PROFILE DESIGN OF HARMONIC DRIVE WITH CUP FLEXSPLINE BASED ON SPATIAL DEFORMATION
Technical Paper Publication. DETC2017-67202

Xiaoxia Chen, *Tianjin Polytechnic University, Tianjin, China,* ***Yunpeng Yao,*** *Tianjin Polytechnic University, No. 399 Bin Shui Xi Road, Xi Qing District, Tianji, China,* ***Jingzhong Xing, Pengpeng Yang,*** *Tianjin Polytechnic University, Tianjin, China*

MR-2-4: PARALLEL SYSTEMS

EXHIBIT HALL LEVEL, ROOM 11 **1:15PM–2:55PM**

Session Organizer: **Xianwen Kong,** *Heriot-watt University, Edinburgh, Scotland*

Session Co-Organizer: **Maria Alba Perez Gracia,** *Idaho State University, Pocatello, ID, USA*

FINITE POSITION SYNTHESIS OF 5-SS PLATFORM LINKAGES INCLUDING PARTIALLY SPECIFIED JOINT LOCATIONS
Technical Paper Publication. DETC2017-67809

Xin Ge, Anurag Purwar, Qiaode Jeffrey Ge, *Stony Brook University, Stony Brook, NY, USA*

SOLUTIONS OF INTERVAL SYSTEMS FOR UNDER-CONSTRAINED AND REDUNDANT PARALLEL MANIPULATORS
Technical Paper Publication. DETC2017-67091

Leila Notash, *Queens University, Kingston, ON, Canada*

KINEMATICS AND WORKSPACE ANALYSIS OF A 3PPPS PARALLEL ROBOT WITH U-SHAPED BASE
Technical Paper Publication. DETC2017-67087

Damien Chablat, *CNRS/LS2N, Nantes, France,* ***Luc Baron,*** *Ecole Polytechnique, Montreal, QC, Canada,* ***Ranjan Jha,*** *Polytechnique Montreal, Montreal, QC, Canada*

FORWARD KINEMATICS OF 3-RPS PARALLEL MECHANISMS USING CONFORMAL GEOMETRIC ALGEBRA
Technical Paper Publication. DETC2017-67489

Ying Zhang, Qizheng Liao, Shimin Wei, Duanling Li, *Beijing University of Posts and Telecommunications, Beijing, China*

68224
Technical Paper Publication. DETC2017-68222

Yukio Takeda, *Tokyo Institute of Technology, Tokyo 152-8552, Japan,* ***Xinghai Liang,*** *Tokyo Institute of Technology, Tokyo, Japan, Japan*

MR-6-3: MOBILE AND SPATIAL ROBOTS

[Cross-listed with MSNDC-16]

EXHIBIT HALL LEVEL, ROOM 10 **1:15PM–2:55PM**

Session Organizer: **James Schmiedeler,** *University of Notre Dame, Notre Dame, IN, USA*

Session Co-Organizer: **Joo H. Kim,** *New York University, Brooklyn, NY, USA*

SLIP PREDICTION OF SKID-STEER MOBILE ROBOTS IN MANUFACTURING ENVIRONMENTS
Technical Paper Publication. DETC2017-68312

Stephen Zuccaro, *Robotic Technologies of Tennessee, Lynchburg, TN, USA,* ***Tristan Hill,*** *Tennessee Tech, Cookeville, TN, USA,* ***Stephen Canfield,*** *Tennessee Technological University, Cookeville, TN, USA*

MULTI-GOAL PATH PLANNING FOR ROBOTIC AGENTS WITH DISCRETE-STEP LOCOMOTION
Technical Paper Publication. DETC2017-68011

Keerthi Sagar, Dimiter Zlatanov, *University of Genoa, Genoa, Italy,* ***Matteo Zoppi,*** *University of Genova, Italy,* ***Cristiano Nattero,*** *University of Genoa, Genoa, Italy,* ***Sreekumar Muthuswamy,*** *IITD&M, Chennai, India*

RELATIVE NAVIGATION OF NON-COOPERATIVE SPACE TARGET BASED ON MULTIPLE COOPERATIVE SPACE ROBOTS
Technical Paper Publication. DETC2017-67130

Yao Hong, Dan Simon, *Cleveland State University, Cleveland, OH, USA*

DESIGN OF A SPHERICAL ROBOT WITH CABLE-ACTUATED DRIVING MECHANISM
Technical Paper Publication. DETC2017-68540

Ernur Karadogan, Brian DeJong, *Central Michigan University, Mount Pleasant, MI, USA*

MODELING AND CONTROL OF AN AERIAL ROBOCRANE USING A WIRE DRIVEN SYSTEM
Technical Paper Publication. DETC2017-67798

Fida Benabdallah, Naoufel Azouz, Lotfi Beji, *University of Evry, Evry-Courcouronnes, France,* ***Azgal Abichou,*** *Polytechnic School of Tunis, La Marsa, Tunisia*

MNS-2-4: NONLINEAR RESONANT DEVICES – BIFURCATION BASED APPLICATIONS

[Cross-listed with VIB-12]

EXHIBIT HALL LEVEL, ROOM 13 **1:15PM–2:55PM**

Session Organizer: **Jian Zhao,** *Dalian University of Technology, Dalian, China*

Session Co-Organizer: **Najib Kacem,** *Univ. Bourgogne Franche-Comte, Besançon, France*

SCALABLE PRESSURE SENSOR BASED ON ELECTROTHERMALLY OPERATED RESONATOR
Technical Paper Publication. DETC2017-67785

Amal Z. Hajjaj, *King Abdullah University of Science and Technology, Makkah Province, Saudi Arabia,* ***Md Abdullah Al Hafiz,*** *King Abdullah University of Science and Technology, Thuwal, Makkah Province, Saudi Arabia,* ***Nouha Alcheikh,*** *King Abdullah University of Science and Technology, Jeddah, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

EXPLOITING NONLINEAR BEHAVIOR OF MEMS RESONATORS FOR FILTER APPLICATIONS
Technical Paper Publication. DETC2017-67863

Saad Ilyas, *King Abdullah University of Science & Technology, Thuwal, Saudi Arabia,* ***Mohammad Younis,*** *King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia*

NONLINEAR AMPLITUDE RESPONSE BASED THRESHOLD MASS SENSOR WITH COMBINATIVE PIEZOELECTRIC CANTILEVER STRUCTURE
Technical Presentation. DETC2017-67829

Jian Zhao, Renjing Gao, Yu Huang, Shutian Liu, *Dalian University of Technology, Dalian, China*

MULTI-THRESHOLD ACCELERATION SWITCH EMPLOYING MAGNETIC-COMPLIANT SELF-LOCKING MECHANISMS
Technical Presentation. DETC2017-67814

Jian Zhao, Yu Huang, Renjing Gao, *Dalian University of Technology, Dalian, China*

A COMPREHENSIVE INVESTIGATION ON NONLINEAR RESONANCE BEHAVIOR IN AN INTENTIONALLY NONLINEARIZED MICROCANTILEVER-POLYMER SYSTEM
Technical Presentation. DETC2017-68531

Keivan Asadi, Junfeng Li, *The Ohio State University, Columbus, OH, USA,* ***Snehan Peshin, Junghoon Yeom,*** *Michigan State University, East Lansing, MI, USA,* ***Hanna Cho,*** *The Ohio State University, Columbus, OH, USA*

MSNDC-3-3: FLEXIBLE MULTIBODY DYNAMICS – 3

BALLROOM LEVEL, ROOM 26C **1:15PM–2:55PM**

Session Organizer: **Grzegorz Orzechowski,** *Lappeenranta University of Technology, Lappeenranta, Finland*

Session Co-Organizer: **Shilei Han,** *University of Maryland, College Park, MD, USA*

INTEGRATING 3D STRESS ANALYSIS WITH FLEXIBLE MULTIBODY DYNAMICS SIMULATION
Technical Paper Publication. DETC2017-67537

Olivier Bauchau, *University of Maryland, College Park, Maryland 20742, MD, USA,* ***Shilei Han,*** *University of Maryland, College Park, MD, USA*

EXPERIMENTAL EXPLORATION OF SCHALLAMACH WAVES IN A MULTIBODY BELT-DRIVE DYNAMICAL SYSTEM
Student Competition Paper. DETC2017-67824

Yingdan Wu, Michael Varenberg, Michael J. Leamy, *Georgia Institute of Technology, Atlanta, GA, USA*

DYNAMIC STUDY ON THE DEPLOYMENT OF A RING TRUSS REFLECTOR ANTENNA
Technical Presentation. DETC2017-68090

Pei Li, Qiang Tian, Haiyan Hu, *Beijing Institute of Technology, Beijing, China*

FLEGX: A JUMPING FLEXIBLE ROBOTIC LEG
Student Competition Paper. DETC2017-68094

Daniele Ludovico, *Politecnico di Torino, Torino, Torino (Piemonte), Italy,* ***Mariapaola D'Imperio,*** *Istituto Italiano Di Tecnologia, Genova, Italy,* ***Ferdinando Cannella,*** *Istituto Italiano di Tecnologia, Polverigi (AN), Italy*

MSNDC-8-1: OPTIMIZATION, SENSITIVITY ANALYSIS, AND UNCERTAINTY QUANTIFICATION IN DYNAMIC SYSTEMS

BALLROOM LEVEL, ROOM 26A **1:15PM–2:55PM**

Session Organizer: **Radu Serban,** *University of Wisconsin Madison, Madison, WI, USA*

Session Co-Organizer: **Yan Wang,** *Georgia Institute of Technology, Atlanta, GA, USA*

INNOVATIVE STRUCTURAL TOPOLOGY OPTIMIZATION APPROACH FOR ROTORDYNAMICS COMPONENTS USING INNOVATIVE MATERIALS AND NEW MANUFACTURING TECHNIQUES
Technical Paper Publication. DETC2017-67061

Enrico Meli, *Florence University, Florence, Italy,* ***Enrico Boccini,*** *University of Florence, Florence, Italy,* ***Andrea Rindi,*** *Florence University, Florence, Italy,* ***Giuseppe Lurisci, Simone Corbò,*** *General Electric Nuovo Pignone, Florence, Italy*

SENSITIVITY ANALYSIS OF BEAM CROSS-SECTION STIFFNESS USING ADJOINT METHOD
Technical Paper Publication. DETC2017-67846

Alfonso Callejo, *University of Maryland, College Park, MD, USA,* ***Olivier Bauchau,*** *University of Maryland, College Park, Maryland 20742, MD, USA,* ***Boris Diskin, Li Wang,*** *National Institute of Aerospace, Hampton, VA, USA*

DIRECT SENSITIVITY ANALYSIS FOR HYBRID ODE SYSTEM WITH NON-SMOOTH CONTACTS
Technical Presentation. DETC2017-67946

Sebastien Corner, Corina Sandu, Adrian Sandu, *Virginia Tech, Blacksburg, VA, USA*

SENSITIVITY ANALYSIS OF CORROSION PARAMETERS AND RELIABILITY BASED DESIGN AND OPTIMIZATION FOR PIPE-LINES
Technical Presentation. DETC2017-68158

Shabbir Memon, Obaidur Rahman Mohammed, *Wichita State University, Wichita, KS, USA,* ***Hamid Lankarani,*** *Wichita State University, Wichita, KS, USA*

MSNDC-9-1: APPLICATIONS IN BIOMECHANICS

[Cross-listed with VIB-14]

BALLROOM LEVEL, ROOM 25C **1:15PM–2:55PM**

Session Organizer: **James Yang,** *Texas Tech, Lubbock, TX, USA*

Session Co-Organizers: **James R. Chagdes,** *Miami University, Oxford, OH, USA,* **Yujiang Xiang,** *University of Alaska-Fairbanks, Fairbanks, AK, USA*

KINEMATIC ANALYSIS OF THE LOLOTTE TECHNIQUE IN ROCK CLIMBING
Technical Paper Publication. DETC2017-67595

Alessio Artoni, Matilde Tomasi, Francesca Di Puccio, *University of Pisa, Pisa, Italy*

MODELING HUMAN-MACHINE INTERACTION DURING A POINTING TASK
Technical Presentation. DETC2017-67865

Gabriel Hepner, *Miami University, Dublin, OH, USA,* ***Leslie Blaha,*** *Pacific Northwest National Laboratory, Richland, WA, USA,* ***Joseph Houpt,*** *Wright State University, Dayton, OH, USA,* ***James R. Chagdes,*** *Miami University, Oxford, OH, USA*

PREDICTIVE SIMULATIONS OF GAIT PREDICT LARGER FOOT CLEARANCE IN A STOCHASTIC ENVIRONMENT
Technical Presentation. DETC2017-68505

Anne Koelewijn, Antonie J. van den Bogert, *Cleveland State University, Cleveland, OH, USA*

NEUROMUSCULAR REFLEX CONTROLLERS FOR A POWERED EXOSKELETON AND THEIR ABILITY TO RESPOND TO MECHANICAL PERTURBATIONS
Technical Presentation. DETC2017-68508

Sandra Hnat, Antonie J. van den Bogert, *Cleveland State University, Cleveland, OH, USA*

MSNDC-12-1: MULTI-PHYSICS IN MULTIBODY SYSTEMS AND NONLINEAR DYNAMICS

BALLROOM LEVEL, ROOM 26-B **1:15PM–2:55PM**

Session Organizer: **Dan Negrut,** *University of Wisconsin, Madison, WI, USA*

Session Co-Organizer: **Ole Balling,** *Aarhus University, Aarhus, Denmark*

MULTISCALE-THERMOSTAT FOR FAST TEMPERATURE-CONTROLLED MOLECULAR DYNAMICS
Technical Presentation. DETC2017-68319

Ashley Guy, *University of Texas at Arlington, Arlington, TX, USA,* ***Alan Bowling,*** *University of Texas at Arlington, Arlington, TX, USA*

SIMULATION OF THE SEABED INSTALLATION OF A SUCTION BUCKET FOUNDATION USING SMOOTHED PARTICLE HYDRODYNAMICS
Technical Presentation. DETC2017-68499

Frederik Foldager, Anders Andersen

PTG-5-1: GEAR MANUFACTURING (1)

EXHIBIT HALL LEVEL, ROOM 16 **1:15PM–2:55PM**

Session Organizer: **Avinash Singh,** *General Motors, Sterling Heights, MI, USA*

Session Co-Organizer: **Carlos Wink,** *Eaton Corp., Portage, MI, USA*

APPLICATION OF AUDIBLE SOUND SIGNALS FOR TOOL WEAR MONITORING AND WORKPIECE HARDNESS IDENTIFICATION IN GEAR MILLING USING MACHINE LEARNING TECHNIQUES
Technical Paper Publication. DETC2017-68067

Achyuth Kothuru, Sai Prasad Nooka, Patricia Iglesias Victoria, Rui Liu, *Rochester Institute of Technology, Rochester, NY, USA*

STUDY ON THE PITCH ERROR IN THE INITIAL STAGE OF GEAR ROLLING PROCESS
Technical Paper Publication. DETC2017-67048

Ziyong Ma, Yuanxin Luo, Yongqin Wang, *Chongqing University, Chongqing, China*

DESIGN OF AN AUTOMATIC TOOTH SURFACE GRINDING BURN SCANNING SYSTEM FOR BEVEL GEARS
Technical Paper Publication. DETC2017-67613

Jiachun Lin, Linghao Zhang, Zhaoyao Shi, Hongfang Chen, *Beijing University of Technology, Beijing, China*

NON-CIRCULAR GEAR SHAVING MOTION CONTROL STUDY BASED ON THE EGB
Technical Presentation. DETC2017-67619

Xiaoqing Tian, Yu Wu, Jiang Han, Lulu Wu, Lian Xia, *Hefei University of Technology, Hefei, China*

PTG-8-1: TRANSMISSION SYSTEMS INCLUDING NOVEL CONCEPTS (1)

EXHIBIT HALL LEVEL, ROOM 15 **1:15PM–2:55PM**

Session Organizer: **Irebert Delgado,** *NASA Glenn Research Center, Cleveland, OH, USA*

Session Co-Organizer: **Timothy Krantz,** *NASA Glenn Research Center MS 23-3, Cleveland, OH, USA*

THE STUDY OF PARAMETERS MATCHING TECHNOLOGY FOR INTEGRATED STARTER GENERATOR
Technical Paper Publication. DETC2017-67015

Yong Zhou, Yanting Han, Yanzhao Mi, Long Chen, *Northwestern Polytechnical University, Xi'an, Shaanxi, China*

DESIGN OF A REAL-TIME DYNAMIC TEST BENCH FOR TESTING AND DEVELOPING A NOVEL SEAMLESS TWO-SPEED TRANSMISSION FOR ELECTRIC VEHICLES
Technical Paper Publication. DETC2017-67179

Truong Sinh Nguyen, Jian Song, Shengnan Fang, Haijun Song, Yuzhuo Tai, Fei Li, *Tsinghua University, Beijing, China*

LIGHTWEIGHT RESEARCH ON HOISTING MECHANISM OF BRIDGE CRANE BASED ON STATIC METHOD
Technical Paper Publication. DETC2017-67418

Shu-yan Wang, Hui-yun Zhu, *Jiangsu University of Science and Technology, Zhenjiang, China,* ***Bing-Kui Chen,*** *Chongqing University, Chongqing, China,* ***Xing Chen, Jin Ding, Lu-Yuan Lv,*** *Jiangsu University of Science and Technology, Zhenjiang, China*

IDENTIFYING STIFFNESS, FRICTION, AND KINEMATIC ERROR SIGNATURE IN GEAR BEARING DRIVE TRANSMISSIONS
Technical Paper Publication. DETC2017-67445

Elias Brassitos, Nader Jalili, *Northeastern University, Boston, MA, USA*

CONTACT MECHANICS AND ELASTOHYDRODYNAMIC LUBRICATION ANALYSIS OF INTERNAL-EXTERNAL STRAIGHT BEVEL GEAR MESH IN A PERICYCLIC DRIVE
Technical Paper Publication. DETC2017-68001

Tanmay Mathur, Edward C. Smith, *The Pennsylvania State University, State College, PA, USA,* ***Liming Chang,*** *Penn State University, University Park, PA, USA,* ***Robert Bill,*** *The Pennsylvania State University, Rocky River, OH, USA*

VIB-8-2: ROTATING SYSTEMS AND ROTOR DYNAMICS II

[Cross-listed with MSNDC-7]

BALLROOM LEVEL, ROOM 25A **1:15PM–2:55PM**

Session Organizer: **C. Nataraj,** *Villanova University, Villanova, PA, USA*

A NUMERICAL STUDY ON VIBRATIONS OF A ROLLER BEARING WITH A SURFACE CRACK IN THE RACES
Technical Paper Publication. DETC2017-67027

Jing Liu, Zhifeng Shi, Yimin Shao, Boyang Shi, Zhongjian Tian, Jiahao Chen, *Chongqing University, Chongqing, China*

FAULT DETECTION IN ROTATING MACHINERY BY USING THE MODAL STATE OBSERVER APPROACH
Technical Paper Publication. DETC2017-67044

Leandro de Souza Leão, Aldemir Aparecido Cavalini Jr., Tobias Souza Morais, *Federal University of Uberlândia, Uberlândia, Minas Gerais, Brazil,* ***Gilberto Pechoto de Melo,*** *UNESP, São Paulo, Brazil,* ***Valder Steffen Jr.,*** *Federal University of Uberlândia, Minas Gerais, Brazil*

DISCRIMINATION OF MULTIPLE FAULTS IN BEARINGS USING DENSITY-BASED ORTHOGONAL FUNCTIONS OF THE TIME RESPONSE
Technical Paper Publication. DETC2017-68375

Turki Haj Mohamad, *Villanova University, Philadelphia, PA, USA,* ***Cedrick Kwuimy,*** *University of Cincinnati, Cincinnati, OH, USA,* ***C. Nataraj,*** *Villanova University, Villanova, PA, USA*

APPLICATION OF PARAMETRIC REDUCED ORDER MODELS FOR COMBINING OPERATIONAL SPEED AND MISTUNING EFFECTS
Technical Presentation. DETC2017-67786

Ryan Wilber, Eric Kurstak, Kiran D'Souza, *The Ohio State University, Columbus, OH, USA*

CASE STUDY VALIDATION OF COMMON TORSIONAL ROTORDYNAMIC PRACTICES FOR INTEGRALLY GEARED COMPRESSORS
Technical Paper Publication. DETC2017-67005

Dhruv Kumar, Michael Moeller Jr., *Ingersoll Rand, Buffalo, NY, USA*

MSNDC-8-2: OPTIMIZATION, SENSITIVITY ANALYSIS, AND UNCERTAINTY QUANTIFICATION IN DYNAMIC SYSTEMS

BALLROOM LEVEL, ROOM 26A **3:15PM–4:15PM**

Session Organizer: **Yan Wang,** *Georgia Institute of Technology, Atlanta, GA, USA*

Session Co-Organizer: **Radu Serban,** *University of Wisconsin Madison, Madison, WI, USA*

A DYNAMIC SYSTEM APPROACH TO THE DESIGN AND MANAGEMENT OF MODULAR MILITARY VEHICLE FLEETS
Technical Presentation. DETC2017-68185

Xingyu Li, *University of Michigan, Ann Arbor, MI, USA,* ***Bogdan Epureanu,*** *University of Michigan, Ann Arbor, MI, USA*

MOVING IN THE RAIN: SHOULD WE RUN OR SHOULD WE WALK?
Student Competition Paper. DETC2017-68379

Michal Kwarta, *University of Wisconsin – Madison, Madison, WI, USA,* ***Arman Pazouki,*** *California State University, Los Angeles, Los Angeles, CA, USA,* ***Dan Negrut,*** *University of Wisconsin, Madison, WI, USA*

EXPERIMENTAL STUDY ON DYNAMIC CHARACTERISTICS OF GEARED SYSTEM WITH UNCERTAINTIES
Technical Presentation. DETC2017-68456

Sha Wei, Xing-Jian Dong, Zhi-Ke Peng, Wen-Ming Zhang, *Shanghai Jiao Tong University, Shanghai, China,* ***Fulei Chu,*** *Tsinghua University, Beijing, China*

MSNDC-14-1: ANALYTICAL AND PERTURBATION METHODS

[Cross-listed with VIB-17]

BALLROOM LEVEL, ROOM 26B **3:15PM–4:15PM**

Session Organizer: **Kiran D'Souza,** *The Ohio State University, Columbus, OH, USA*

Session Co-Organizer: **Mohammad AL-Shudeifat,** *Khalifa University, Abu Dhabi, United Arab Emir*

ANALYSIS OF SYSTEMS WITH GENERALIZED LIGHT DAMPING WITH EMPHASIS ON MODE COUPLING
Student Competition Paper. DETC2017-67917

Allen Mathis, *The University of Akron, Wadsworth, OH, USA,* ***D. Dane Quinn,*** *Akron, OH, USA*

ANALYTICAL TREATMENT FOR BISTABLE NONLINEARLY COUPLED OSCILLATORS
Technical Paper Publication. DETC2017-67762

Mohammad AL-Shudeifat, Adnan Saeed, *Khalifa University, Abu Dhabi, United Arab Emir.*

MSNDC-16-1: DYNAMICS & CONTROL OF ROBOTIC SYSTEMS

[Cross-listed with MR-6]

EXHIBIT HALL LEVEL, ROOM 10 **3:15PM–4:15PM**

Session Organizer: **Hao Wang,** *Shanghai Jiao Tong University, Shanghai, China*

Session Co-Organizer: **Mohammad Poursina,** *University of Arizona, Tucson, AZ, USA*

THE REALIZATION OF DESIRED STIFFNESS OF PARALLEL MECHANISM BY ADDING REDUNDANTLY-ACTUATED LIMBS
Technical Paper Publication. DETC2017-67747

Shunzhou Huang, *Shanghai Aerospace Equipment Manufacturer, Shanghai, China,* ***Jue Yu, Hao Wang, Yong Zhao, Xinmin Lai,*** *Shanghai Jiao Tong University, Shanghai, China*

KINEMATICS AND DYNAMICS COMPARISON BETWEEN THREE PARALLEL ROBOTS FOR LOWER EXTREMITY REHABILITATION
Student Competition Paper. DETC2017-68357

Arman Dabiri, Sahand Sabet, Mohammad Poursina, *University of Arizona, Tucson, AZ, USA,* ***P. Nikravesh,*** *University of Arizona, Tucson, AZ, USA,* ***David G. Armstrong,*** *University of Arizona, Tucson, AZ, USA*

RAMP Perturbation Tests Are Too Simple To Identify a Realistic Controller in Human Standing Balance
Technical Presentation. DETC2017-68509

Huawei Wang, Antonie J. van den Bogert, *Cleveland State University, Cleveland, OH, USA*

PTG-5-2: GEAR MANUFACTURING (2)

EXHIBIT HALL LEVEL, ROOM 16 **3:15PM–4:15PM**

Session Organizer: **Karsten Stahl,** *Technical University of Munich, Germany*

Session Co-Organizer: **Jiachun Lin,** *Beijing University of Technology, Beijing, China*

GEAR CUTTING PARAMETERS EFFECT ON NOISE CHARACTERISTIC OF HEAVY DUTY AXLE DRIVE LINE COMPONENTS
Technical Presentation. DETC2017-68542

Mark Lelkes, Zsolt Varga, *Raba Axle Ltd, Hungary*

MACHINING METHOD OF LARGE-SIZED CYLINDRICAL WORM GEAR WITH NEIMAN PROFILE USING CNC MACHINING CENTER
Technical Presentation. DETC2017-68545

Kazumasa Kawasaki, *Niigata University, Niigata, Niigata, Japan,* ***Isamu Tsuji,*** *Iwasa Tech. Co. Ltd., Funabashi, Japan*

MODIFICATION OF SURFACE STRUCTURE AND GEOMETRY ON GEARS
Technical Presentation. DETC2017-68437

Walter Graf, *Reishauer AG, Wallisellen, Zurich, Switzerland*

PTG-8-2: TRANSMISSION SYSTEMS INCLUDING NOVEL CONCEPTS (2)

EXHIBIT HALL LEVEL, ROOM 15 **3:15PM–4:15PM**

Session Organizer: **Bing-kui Chen,** *Chongqing University, Chongqing, China*

Session Co-Organizer: **Steve Siegert,** *BorgWarner, Ithaca, NY, USA*

DYNAMIC STIFFNESS MODEL OF PLANETARY ROLLER SCREW MECHANISM WITH CLEARANCE, GEOMETRY ERRORS AND ROLLING-SLIDING FRICTION
Technical Paper Publication. DETC2017-67488

Shangjun Ma, Cheng Peng, Xiaofeng Li, *Northwestern Polytechnical University, Xi'an, China,* ***Geng Liu,*** *Northwestern Polytechnical University, Xi'an, Shaanxi, China*

A 3D MULTI-BODY DYNAMICS MODEL FOR CHAIN-TYPE CONTINUOUSLY VARIABLE UNIT
Technical Paper Publication. DETC2017-67887

Mohammad Hotait, *General Motors, Pontiac, MI, USA,* ***Avinash Singh,*** *General Motors, Sterling Heights, MI, USA*

A NOVEL DESIGN METHOD FOR POWER SHIFTING TRANSMISSION OF PARALLEL HYBRID ELECTRIC VEHICLE
Technical Presentation. DETC2017-68085

Zengxiong Peng, Xueliang Li, Jibin Hu, *Beijing Institute of Technology, Beijing, China*

VIB-8-3: ROTATING SYSTEMS AND ROTOR DYNAMICS III

[Cross-listed with MSNDC-7]

BALLROOM LEVEL, ROOM 25A **3:15PM–4:15PM**

Session Organizer: **C. Nataraj,** *Villanova University, Villanova, PA, USA*

STRESS ANALYSIS OF A TOUCHDOWN BEARING HAVING AN ARTIFICIAL CRACK
Technical Paper Publication. DETC2017-67750

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19TH INTERNATIONAL CONFERENCE ON ADVANCED VEHICLE TECHNOLOGIES (AVT)

AVT-1: Advances in Ground Vehicles Dynamics and Controls
Vladimir V Vantsevich and Schalk Els

AVT-2: Advances in Methods for Tire Design and Mechanics
Moustafa El-Gindy and Lin Li

AVT-3: Advances in Methods for Ground Vehicle Systems Design
Massimiliano Gobbi and Guangqiang Wu

AVT-4: Advances in Ground Vehicle Safety and Ergonomics
Costin Untaroiu, Alan Mayton and James Yang

AVT-5: Advances in Vehicle Electrification and Powertrain Design
Joel Anstrom and Guang Dong

AVT-6: Advances in Light Vehicles Design
Alberto Doria, Luis Munoz and Lirong Wang

AVT-7: Advances in Military and Commercial Ground Vehicle Design
Xiaobo Yang, Brendan Chan and Bin Li

AVT-8: Advances in Autonomous and Connected Vehicles
Liangyao Yu and Beshah Ayalew

AVT-9: William Milliken Lecture Award
Not Available at Press Time

37TH COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE (CIE)

CIE-1: Advanced Modeling and Simulation (AMS General)
Seung Ki Moon, Krishna Kaipa and Ravi Burla

CIE-2: AMS: Inverse Problems in Science and Engineering
Brian Dennis

CIE-3: AMS: Computational Multiphysics Applications
John Michopoulos

CIE-4: AMS: Uncertainty Quantification in Simulation and Model Verification & Validation
Yan Wang, Zhimin Xi and Chao Hu

CIE-5: AMS: Simulation in Advanced Manufacturing
Mahesh Mani, Gaurav Ameta, Bjorn Johansson and Kevin Lyons

CIE-6: AMS/SEIKM/CAPPD: Design, Simulation and Optimization for Additive Manufacturing
Paul Witherell, Ashis Banerjee, Krishnan Suresh, Seung Ki Moon, Namhun Kim and Chi Zhou

CIE-7: AMS Panel
Seung Ki Moon

CIE-8: Computer-Aided Product and Process Development (CAPPD General)
John Steuben, Caterina Rizzi, Gaurav Ameta, Rahul Rai and Chi Zhou

CIE-9: CAPPD: Emotional Engineering
John Steuben, Shuichi Fukuda and Chi Zhou

CIE-10: CAPPD: Human Modeling-Methods and Applications in Engineering
John Steuben, James Yang, Giorgio Colombo, Caterina Rizzi, Yujiang Xiang and Chi Zhou

CIE11: CAPPD: Multimodal INTerfaces for Engineering Design (MINTED)
John Steuben, Rahul Rai and Chi Zhou

CIE-12: Systems Engineering Information Knowledge Management (SEIKM General)
Christopher Hoyle, Ashis Banerjee and David C. Jensen

CIE-14: SEIKM: Design Informatics
Bryony DuPont, Christopher Hoyle, Ying Liu and Ashis Banerjee

CIE-15: SEIKM: Systems Engineering
Douglas Van Bossuyt, Douglas Allaire, Bryan O'Halloran and Ashis Banerjee

CIE-16: SEIKM: Knowledge Capture, Reuse, and Management
Ian Grosse, David C. Jensen and Ashis Banerjee

CIE-17: SEIKM: Smart Manufacturing Informatics
Ashis Banerjee and Farhad Ameri

CIE-18: SEIKM: Risk-Aware Cyber-Physical Systems
Douglas Van Bossuyt, Bryan O'Halloran, Nikolaos Papakonstantinou and Ashis Banerjee

CIE-19: SEIKM: Human Factors and Cognitive Systems
Linda Boyle and Ashis Banerjee

CIE-20: SEIKM Panel
Ashis Banerjee

CIE-21: Virtual Environments and Systems (VES General)
Robert E. Wendrich, Pramita Mitra and Theo Lim

CIE-22: VES: Methods, Processes and Strategies (MPS)
Robert E. Wendrich, Theo Lim and Pramita Mitra

CIE-23: VES: Game Ecosystems in Design and Engineering (GEcoDE)
Not Available at Press Time

CIE-24: VES PANEL Title: Advancement in Digital Technology Systems, Usage of Virtual Reality and Tools for Engineering
Robert E. Wendrich, Pramita Mitra, Theo Lim, Jannicke Baalsrud Hauge and Samir Garbaya

CIE-26: Graduate Student Poster Session
Yayue Pan and John Steuben

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CIE-27: Industry Presentation: Computer and Information Technology Trends (Industry Proposals)
Marc Halpern and Pramita Mitra

CIE-28: CIE Panel: From a Researcher/Technology Developer to an Advanced Technology Visionary/Facilitator - A Perspective
Catherine Florio and Nien-hua Chao

CIE-29: DAC/CIE Joint Session: Design for Resilience and Failure Recovery
Pingfeng Wang, Yan Wang, Byeng D. Youn, Po Ting Lin, Chao Hu and Zhimin Xi

CIE-30: AMS: Material Characterization Methods and Applications
John Michopoulos and Athanasios Iliopoulos

CIE-31: Knowledge Engineering and Management for Smart Manufacturing
Thomas Hedberg, Allison Bernard Feeney and Shaw Feng

CIE-32: CAPPD Panel
John Steuben

CIE-33: Title
Mahesh Mani

CIE-34: CIE Keynote Presentation
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43RD DESIGN AUTOMATION CONFERENCE (DAC)

DAC-1: Artificial Intelligence and Computational Synthesis
Matthew Campbell and Ritesh Khire

DAC-2: Active System Design
Krishna Vijayaraghavan, Christopher Vermillion, and James Allison

DAC-3: Data-Driven Design
Conrad Tucker, Souma Chowdhury, Ritesh Khire, Kemper Lewis, Andrew Olewnik, Jie Zhang and Alex Burnap

DAC-4: Decision Making in Engineering Design
Kemper Lewis, Jesse Austin-Breneman and Jitesh Panchal

DAC-5: Design and Optimization of Sustainable Energy Systems
Erin MacDonald, Amy Bilton, Souma Chowdhury, Bryony DuPont, Nathan Johnson and Jie Zhang

DAC-6: Design for Additive Manufacturing
Carolyn Seepersad, Georges Fadel, Wentao Fu, James Guest, Kristina Shea, Timothy W. Simpson and Christopher Williams

DAC-7: Design for Market Systems
Scott Ferguson, Kenneth Mark Bryden and Kate S. Whitefoot

DAC-8: Design for Resilience and Failure Recovery
Pingfeng Wang, Chao Hu, Po Ting Lin, Yan Wang and Zhimin Xi

DAC-9: Engineering for Global Development
Nordica MacCarty, Amy Bilton, Kenneth Mark Bryden, Nathan Johnson and Christopher A. Mattson

DAC-10: Design of Complex Systems
Beshoy Morkos, Babak Heydari, Rahul Renu and Paul T. Grogan

DAC-11: Design of Engineering Materials and Structures
Carolyn Seepersad, Shikui Chen, Wei Chen, Seung-Kyum Choi, Guang Dong, James Guest, Matthew Lynch, Andres Tovar, Hongyi Xu and Julian Norato

DAC-12: Geometric Modeling and Algorithms for Design and Manufacturing
Saigopal Necaturi, Shikui Chen and Horea Ilies

DAC-13: Human-Centered Design
Matthew Parkinson and Charlotte de Vries

DAC-14: Metamodel-Based Design Optimization (MBDO)
Cameron Turner and Ali Mehmani

DAC-15: Multi-Objective Optimization and Sensitivity Analysis
Mian Li and Daniel Selva

DAC-16: Multidisciplinary Design Optimization
Po Ting Lin, John Hall and Hongyi Xu

DAC-17: Platform Architecture and Product Family Design
Timothy W. Simpson, Scott Ferguson, Christopher Hoyle, Ritesh Khire and Seung Ki Moon

DAC-18: Product-Service System Design
Seung Ki Moon

DAC-19: Simulation-Based Design Under Uncertainty
Zissimos Mourelatos, Xiaoping Du, Zhen Hu, Ikjin Lee, Mian Li, Po Ting Lin and Zhimin Xi

DAC-20: Keynote Lecture
Kemper Lewis and Scott Ferguson

14TH INTERNATIONAL CONFERENCE ON DESIGN EDUCATION (DEC)

DEC-1: Design Education in the Undergraduate Curriculum
Janet Allen

DEC-2: Research Methods in Design Education
Zahed Siddique

DEC-3: Evaluations and Assessment in Design Education
Zhenghui Sha

DEC-4: Fabrication and Making Things in Design Education
Daniela Faas

DEC-5: Keynote
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22ND DESIGN FOR MANUFACTURING AND THE LIFE CYCLE CONFERENCE (DFMLC)

DFMLC-1: Keynote Lecture
Qing Wang

DFMLC-2: Sustainable Design and Manufacturing
Qing Wang and Jeremy Rickli

DFMLC-3: Life Cycle Decision Making
Fu Zhao and Jun-Ki Choi

DFMLC-4: Design for Manufacturing and Assembly
Karl Haapala and Hao Zhang

DFMLC-5: Design for Sustainable Additive Manufacturing
Yayue Pan and Wentao Fu

DFMLC-6: Emerging Design for X (Quality, Reliability, Cost, Maintainability, etc.)
Marcos Esterman and Gul Kremer

DFMLC-7: Design for End-of-Life Recovery
Deborah Thurston and Sara Behdad

DFMLC-8: Conceptual Design and Manufacturability Analysis
Qingjin Peng and Yaoyao Fiona Zhao

DFMLC-9: Advances in Energy Conversion for Power Generation
Ashwani Gupta and Ryoichi Amano

DFMLC-10: Design of Sustainable Energy Systems
Romain Farel and Amin Mirkouei

DFMLC-11: Engineering for Global Development
Cassandra Telenko and Jesse Austin-Breneman

DFMLC-12: NSF Workshop
Gul Kremer

DFMLC-13: Special Session: Lightning Talks on the Sustainable Design Frontier
Deborah Thurston and Sara Behdad

DFMLC-14: Student Poster Competition on Data-Driven X for the Life Cycle
William Bernstein and Michael Sharp

29TH INTERNATIONAL CONFERENCE ON DESIGN THEORY AND METHODOLOGY (DTM)

DTM-1: Creativity and Ideation
Noe Vargas Hernandez, Amaresh Chakrabarti, Scarlett Miller and Katherine Fu

DTM-2: Biologically Inspired Design
Daniel Jensen

DTM-3: User Preferences
Kristin Wood

DTM-4: Design Decision-Making
Deborah Thurston and Jitesh Panchal

DTM-5: Human Behavior in Design
Jesse Austin-Breneman, Vimal Kumar, Cherickal Viswanathan, Scott Ferguson and Jonathan Cagan

DTM-6: Sustainability in Design
Marco Aurisicchio

DTM-7: Design and Engineering for Global Development
Alice Agogino

DTM-8: Inclusive Design
L.H. Shu

DTM-9: Computation and Big Data in Design
Saeema Ahmed-Kristensen

DTM-10: Prototyping and Design Representation
Barry Kudrowitz

DTM-11: Design of Complex Systems
Erin MacDonald, James Allison, Claudia Eckert and Douglas Van Bossuyt

DTM-12: Entrepreneurship and Teams in Design
Christine Toh

DTM-13: Trends and Technologies Impacting the Design Process
Julie Linsey

DTM-14: New and Emerging Trends in Design Theory
Julie Linsey, Scarlett Miller, Katherine Fu, Tahira Reid, Maria Yang and Gregory Mocko

13TH ASME/IEEE INTERNATIONAL CONFERENCE ON MECHATRONIC & EMBEDDED SYSTEMS & APPLICATIONS (MESA)

MESA-1: Autonomous Systems and Ambient Intelligence (ASAI)
Emanuele Frontoni

MESA-2: Bio-Mechatronics ? Medical Devices & Technologies
Shane Xie

MESA-3: Design and Verification Methodologies for Mechatronic & Embedded Systems
Peter Rössler

MESA-4: Diagnosis and Monitoring in Mechatronic Systems (DMMS)
Andrea Monteriù

MESA-5: Embedded Systems Infrastructure and Theory
Martin Horauer

MESA-6: Fractional Derivatives and Their Applications (FDTA)
Yangquan Chen, Dumitru Baleanu and Changpin Li

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MESA-7: Cloud Computing and Emerging Technologies for Mechatronic and Embedded Systems
Yu-cheng Chou

MESA-8: Mechatronics for Advanced Manufacturing (MAM)
Po Ting Lin

MESA-9: Mechatronic Control and Electrical Vehicular Systems
István Lakatos

MESA-10: Mechatronics and Embedded Systems Applications (MESA)
Adriano Mancini

MESA-11: Mechatronics and Embedded Systems in Education (MESE)
Zhaoqing Wang

MESA-12: Mechatronics and Embedded Systems for Renewable Energy Systems
Chengbin Ma

MESA-13: Mechatronic & Embedded Technologies in Intelligent Transportation Systems (METITS)
Massimo Bertozzi and Primo Zingaretti

MESA-14: Robotics and Mobile Machines (RMM)
Massimo Callegari

MESA-15: Sensors and Actuators
Ja Choon Koo

MESA-16: Shield Machine & Tunnel Boring Machines
Not Available at Press Time

MESA-17: Small Unmanned Aerial Vehicle Technologies and Applications (SUAVTA)
Yangquan Chen and Youmin Zhang

MESA-18: Virtual Prototyping in Mechatronics (VPM)
Maura Mengoni

MESA-19: Mechatronics and Industry 4.0
Mikko Sallinen

MESA-20: Cyber-Physical Systems and Hybrid Systems
Zhaodan Kong and Po Ting Lin

MESA-21: Micro-/Nano-Manipulation Technologies and Applications
Peng Yan and Zhen Zhang

MESA-22: Disturbance Rejection Control
Wenchao Xue, Li Sun and Qing Zheng

MESA-23: Keynote
Tapio Heikkilä and Emanuele Frontoni

41ST MECHANISMS AND ROBOTICS CONFERENCE (MR)

MR-1: Mechanism Synthesis & Analysis
Feng Gao and David Myszka

MR-2: Theoretical & Computational Kinematics (A.T. Yang Symposium)
Leila Notash and GUIMIN CHEN

MR-3: Compliant Mechanisms (A. Midha Symposium)
Charles Kim and Girish Krishnan

MR-4: Origami-Based Engineering Design
Mary Frecker, Zhong You and James Joo

MR-5: Micro/Nano Robotics and Manufacturing
David Cappelleri, Gloria Wiens and Irene Fassi

MR-6: Dynamics & Control of Robotic Systems
Philip Voglewede and Hao Wang

MR-7: Medical & Rehabilitation Robotics
Jason Moore and Ketao Zhang

MR-8: Novel Mechanisms, Robots & Applications
Nina Robson and Amos Winter

MR-9: Keynote
James Schmiedeler

MR-10: Awards
Andrew P. Murray

MR-11: Student Mechanism & Robot Design Competition
Brian Trease and Joshua Bishop-Moser

11TH INTERNATIONAL CONFERENCE ON MICRO- AND NANOSYSTEMS (MNS)

MNS-1: Keynote Lecture
Mohammad Younis and Slava Krylov

MNS-2: Dynamics of MEMS and NEMS
Mohammad Younis, Slava Krylov, Jian Zhao and Najib Kacem

MNS-3: Bio MEMS/NEMS
Brian Jensen, Gou-Jen Wang and Dumitru Caruntu

MNS-4: Micro/Nano Robotics and Manufacturing
Ashis Banerjee, Irene Fassi, David Cappelleri, Gloria Wiens and Feng Shi

MNS-5: Functional Materials and Surface Engineering
Longqiu Li, Mircea Teodorescu and Yu Liu

MNS-6: MEMS Sensors and Actuators
Teresa Ryan, Jun Tang and Shahrzad Towfighian

MNS-7: Microscale Energy Harvesting
Yong Shi and Xudong Wang

MNS-8: Dynamics and Control of Atomic Force Microscopy
Hanna Cho and Jonathan Felts

13TH INTERNATIONAL CONFERENCE ON MULTIBODY SYSTEMS, NONLINEAR DYNAMICS, AND CONTROL (MSNDC)

MSNDC-1: Fluid-Structure Interaction
Phanindra Tallapragada, Johannes Gerstmayr, Pierangelo Masarati and Marco Morandini

MSNDC-2: Nonlinear Energy Transfers and Harvesting (MSNDC/ VIB 13-3)
Mohammad Amin Karami, Amin Bibo and Brian P. Mann

MSNDC-3: Flexible Multibody Dynamics
Jose Escalona, Aki M. Mikkola and Grzegorz Orzechowski

MSNDC-4: Contact and Interface Dynamics (MSNDC/ VIB 13-6)
Marek Wojtyra, Paulo Flores and Arman Pazouki

MSNDC-5: Nonlinear Dynamics of Structures (MSNDC/VIB 13-4)
Marco Amabili, Mathias Legrand, Enrico Babilio and Laura Ruzziconi

MSNDC-6: Time-Varying and Time-Delay Systems
Albert Luo and Jose Machado

MSNDC-7: Nonlinear Rotordynamics and Rotating Systems (MSNDC/ VIB 13-8)
Olivier Bauchau and Pierangelo Masarati

MSNDC-8: Optimization, Sensitivity Analysis, and Uncertainty Quantification in Dynamic Systems
Radu Serban and Yan Wang

MSNDC-9: Applications in Biomechanics (MSNDC/VIB-14)
James Yang, James R Chagdes and Yujiang Xiang

MSNDC-10: Modeling, Simulation, and Validation of Vehicle Dynamics (MSNDC/ VIB 13-10)
Hiroyuki Sugiyama, Werner Schiehlen and Paramsothy Jayakumar

MSNDC11: Controls and Mechatronics
Elzbieta Jarzebowska, Jerzy Graffstein and Andrzej Urbas

MSNDC-12: Multi-physics in Multibody Systems and Nonlinear Dynamics
Dan Negrut, Abhi Jain and Ole Balling

MSNDC-13: Computational Methods in Multibody Systems and Nonlinear Dynamics
Javier Cuadrado, Werner Schiehlen and Olivier Bauchau

MSNDC-14: Analytical and Perturbation Methods (VIB-17)
Eihab Abdel-Rahman, Mohammad AL-Shudeifat and Kiran D'Souza

MSNDC-15: Software Tools for Computational Dynamics
Alexander Humer, Karin Nachbagauer and Ramin Masoudi

MSNDC-16: Dynamics & Control of Robotic Systems (MSNDC/ MR-6)
Hao WANG and Philip Voglewede

MSNDC-17: Lyapunov Award Lecture and Autonomous and Connected Vehicles Keynotes
Dan Negrut and Radu Serban

MSNDC-18: Best Paper Award Competition
Stefano Lenci and Hiroyuki Sugiyama

MSNDC-19: Student Paper Competition
James R Chagdes and Mohammad Poursina

2017 ASME INTERNATIONAL POWER TRANSMISSION AND GEARING CONFERENCE (PTG)

PTG-1: Gear Geometry
Mohsen Kolivand and Alfonso Fuentes-Aznar

PTG-2: Gear Analysis, Materials, Fatigue
Hai Xu, Sheng Li and Jeremy Wagner

PTG-3: Gear Dynamics and Noise
Hai Xu, Murat Inalpolat and Brian Wilson

PTG-4: Gearbox Design, Reliability, and Diagnostics
Brian Dykas, Robert Handschuh and Steve Siegert

PTG-5: Gear Manufacturing
Avinash Singh and Carlos Wink

PTG-6: Lubrication and Efficiency
Robert Handschuh, David Talbot, Timothy Krantz and Jeremy Wagner

PTG-7: Bearings, Clutches, Couplings, and Splines
Jon Williams, David Talbot and Richard Dippery, Jr

PTG-8: Transmission Systems Including Novel Concepts
Jon Williams, Steve Siegert and Timothy Krantz

PTG-9: Keynote Lecture
Teik Lim and Qi Fan

PTG-10: Industrial Applications
Carlos Wink and Avinash Singh

29TH CONFERENCE ON MECHANICAL VIBRATION AND NOISE (VIB)

VIB-1: TCVS Keynote and Award Lectures
Dumitru Caruntu

VIB-2: Structures and Continuous Systems
Dumitru Caruntu, Weidong Zhu and Marco Amabili

VIB-3: Vibration Control, Energy Harvesting, and Smart Structures (VIB/ MSNDC 10-2)
Ryan L. Harne, Lei Zuo and Alper Erturk

Symposium Organizers

IDETC/CIE

VIB-4: Nonlinear Systems and Phenomena (VIB/ MSNDC 10-6)
Stefano Lenci, Jose Manoel Balthazar, Paulo B. Goncalves and Farbod Alijani

VIB-5: Vibration and Stability of Mechanical Systems
Christopher G. Cooley and Robert Parker

VIB-6: Jointed Structures, Contact, Friction, and Damping (VIB/ MSNDC 10-5)
Matthew Brake, Aldo Ferri, Matthew Allen and Adam Brink

VIB-7: Wave Propagation and Acoustics
Michael J. Leamy

VIB-8: Rotating Systems and Rotor Dynamics (VIB/ MSNDC 10-8)
C. Nataraj, Regis Dufour, Paolo Pennacchi and Prof. Kshitij Gupta

VIB-9: System Identification, Damage Detection and Diagnostics
Weidong Zhu and Yongfeng Xu

VIB-10: Industrial Applications of Dynamics, Vibration, and Acoustics (VIB/ MSNDC 11)
Brian Olson, Matthew Brake, Bruce Geist, Ron Couch and Matt Lear

VIB11: Emerging Systems and Applications
D. Dane Quinn, Stephanos Theodossiades and Venkat Ramakrishnan

VIB-12: Dynamics of MEMS and NEMS (VIB/MNS/MSNDC)
Mohammad Younis, Slava Krylov, Najib Kacem and Jian Zhao

VIB-13: Experimental Nonlinear Dynamics
Brian Feeny and Guilhem Michon

VIB-14: Dynamics and Control of Biomechanical Systems (VIB/MSNDC-10)
Dumitru Caruntu, Bogdan Epureanu and Davide Piovesan

VIB-15: Dynamics of Mechanical and Acoustic Metamaterials
Ryan L. Harne, Chengzhi Shi and Massimo Ruzzene

VIB-16: Time-Varying and Time-Delay Systems
Matthew Allen, Robert Parker and Matthew Brake

VIB-17: Analytical and Perturbation Methods
Kiran D'Souza, D. Dane Quinn, Jiong Tang and Dumitru Caruntu

10TH FRONTIERS IN BIOMEDICAL DEVICES (BIOMED)

BIOMED-1: Wearable & Implantable Technologies
Mohammad Amin Karami

BIOMED-2: Biorobotics and Haptics
Not Available at Press Time

Many thanks to our dedicated conference organizers who have worked incredibly hard to develop the many facets of this event.

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Virtuose 6D

Able

Inca 6D

Scale 1

HGlove

▶ Software

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Robotics

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Research

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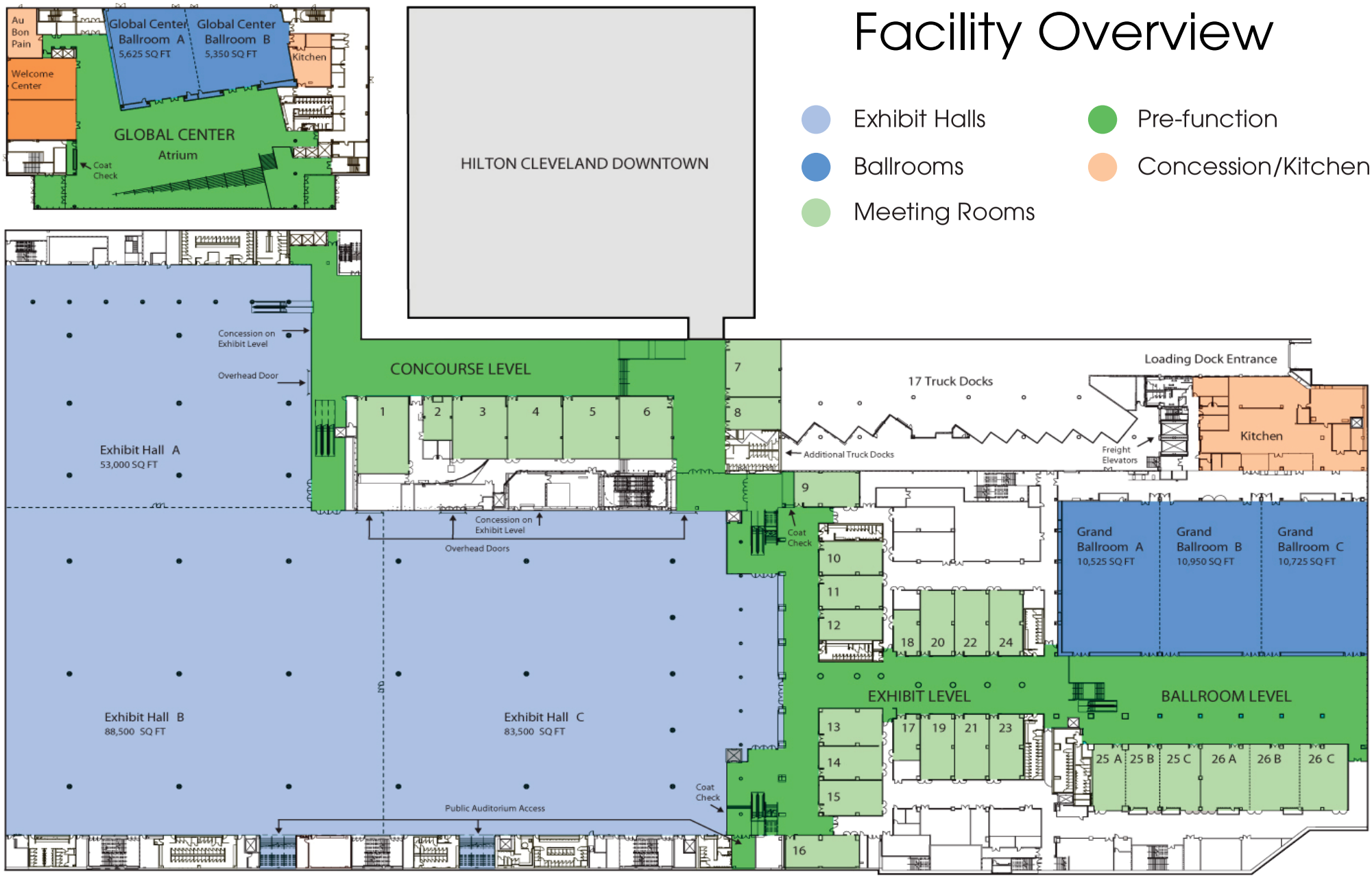
Facility Overview



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See you in 2018!

IDETC/CIE 2018

August 26–29, 2018

QUEBEC CITY, CANADA

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INTERNATIONAL DESIGN ENGINEERING TECHNICAL CONFERENCES & COMPUTER AND INFORMATION IN ENGINEERING CONFERENCE

ASME
SETTING THE STANDARD

ASME 2017
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