

Welcome

On behalf of the local organizing committee, it is our great pleasure to welcome you to attend the 30th International Conference on Adaptive Structures and Technologies (ICAST2019).

ICAST2019 aims at promoting research, development and application of adaptive structures and technologies through the exchange of scientific results and insight from leading international scholars and specialists as well as the young researchers. The conference showcases the state of the art in this innovative and multidisciplinary area. It provides a forum for the discussion of recent advances in the broad fields of smart materials and structures. ICAST2019 program includes 87 technical papers, which is presented in 4 keynote speeches, 8 single sessions and 8 parallel student sessions.

We are honored to host the 30th anniversary event of the ICAST at the Conference Center of Concordia University. With your participation, we anticipate a valuable, enjoyable and memorable event.

Local Organizing Committee



Ramin Sedaghati
General Chair
Concordia University



Yong Chen
General Chair
National Research Council (NRC)



Subhash Rakheja
General Co-Chair
Concordia University



Viresh Wickramasinghe
General Co-Chair
National Research Council (NRC)



Masoud Hemmatian
Technical Chair
Concordia University



Armin Rasooli
Technical Assistant
Concordia University

Special Events

Welcome Reception

Tuesday, October 08, 2019, 18:30 – 20:30
Concordia University Conference Center (MB 9) – Rooms E, F, and G

Montreal City Tour

Thursday, October 10, 2019, 15:45 – 18:45
Montreal City Tour incorporates the must-see highlights of the city in few hours. The guided tour will be started from the downtown and be finished in Old Montreal. The bus will depart at 15:45 from Concordia University (Hall Building, 1455 Boulevard de Maisonneuve West, Montreal, QC, H3G 1M8). The tour will be finished at 18:45 at VIEUX-PORT STEAKHOUSE. Pre-registration is required and for those who did not pre-register, limited tickets are available at the reception desk on a first-come, first-served basis.

Best Student Presentation Award

Student Sessions are on Thursday, October 10, 2019. Student presentations will be evaluated, and the best student presentations will be awarded by ICAST 2019 at the Banquet.

Banquet

Thursday, October 10, 2019, 19:00 – 21:00
VIEUX-PORT STEAKHOUSE
Join us for a special evening at VIEUX-PORT STEAKHOUSE (39, Rue Saint-Paul Est, Montreal, QC, H2Y 1G2). For those who did not attend the Montreal City Tour, a bus will depart at 18:30 from Concordia University (Hall Building, 1455 Boulevard de Maisonneuve West, Montreal, QC, H3G 1M8). A bus will depart back to Concordia University at 21:30.

Plenary Speakers



Smart and adaptive 4D materials – hierarchical manufacturing

Hani Naguib
University of Toronto

Abstract: Smart materials related research and applications have grown tremendously in the past couple of decades. The emergence of natural and synthetic smart materials possessing a set of desired properties, along with the development of novel processing techniques and a willingness of competitive manufacturers to adopt new materials has resulted in new smart materials components replacing the roles of traditional materials.

Smart materials can also offer several benefits as components in adaptive and multifunctional materials. This seminar presents the design and hierarchical manufacturing of smart materials to achieve active 4D and multifunctional materials that are capable of sensing and responding to external stimuli with time. Examples of smart materials used in this study are shape-memory materials, piezoelectric and thermoelectric hybrids with main applications in smart textiles, artificial muscles and energy harvesting.

Biography: Professor Hani Naguib is a Professor at the University of Toronto, and director of the Toronto Institute for Advanced Manufacturing. His major expertise is in the area of manufacturing of smart materials and systems including: electro-active materials, metamaterials, and biomaterials. Naguib is the recipient of many honours and awards such as the Canada Research Chair, the Premier's Early Research Award of Ontario, the Canada Foundation of Innovation, and the faculty Early Teaching Award. He is a Professional Engineer in Canada, a Chartered Engineer in U.K., a Fellow of the Institute of Materials Minerals and Mining IOM3, the American Society of Mechanical Engineers ASME, the Society of Plastics Engineers SPE, the Canadian Society of Mechanical Engineers CSME, and the International Society for Optics and Photonics SPIE. Dr. Naguib is serving as Associate Editor for the IOP Journal of Smart Materials and Structures, Journal of Cellular Plastics and Cellular Polymers.



Integrated design of magnetorheological fluid and energy absorbers for optimal system performance

Norman Wereley
University of Maryland

Abstract: The ability to dissipate energy in vehicle systems, especially with the goal of protecting occupants from potentially injurious vibration, repetitive shock, crash and blast loads, is becoming a critical issue as the cumulative impact of these load spectra on chronic health and acute injury are becoming better understood. Typically, adaptive vibration and shock mitigation systems have utilized commercial-off-the-shelf magnetorheological fluids (MRFs) with specified properties as opposed to properties that are optimized for the particular application. The objective of this talk is to discuss what properties are optimal for a number of particular applications such as vibration isolation, shock load mitigation, or earthquake hazard mitigation. A number of key non-dimensional parameters can be used to gain insight into how to define optimality for various applications including: Bingham number, Hedstrom number, Reynolds number, Mason number, dynamic range. Also, the trade-offs associated in designing an optimal MRF for a particular application are discussed. These trade-offs are illustrated using case studies from analytical, experimental and CFD studies.

Biography: Professor Norman Wereley's current research interests are focused on active and passive vibration and shock mitigation (especially occupant protection systems) using primarily magnetorheological materials, and soft actuators and soft robotic systems. Dr. Wereley has published over 220 journal articles, 16 book chapters, over 275 conference articles, and 20 patents. Dr. Wereley is Editor of the Journal of Intelligent Material Systems and Structures and associate editor of Smart Materials and Structures. He is the recipient of the ASME Adaptive Structures and Materials Systems. Dr. Wereley is the recipient of the ASME Adaptive Structures and Material Systems Prize (2012) and the SPIE Smart Structures and Materials Lifetime Achievement Award (2013). Dr. Wereley is a Fellow of AIAA, AHS, ASME, SPIE, and the Institute of Physics. He is also a Senior Member of IEEE. Dr. Wereley has a B.Eng. (1982) from McGill University and M.S. (1987) and Ph.D. (1990) from the Massachusetts Institute of Technology.



Design of multifunctional composites and their advanced additive manufacturing

Daniel Therriault
Polytechnique Montréal

Abstract: The manufacturing of smart composites composed of various functional components and built-in sensors is a serious technological challenge. Additive manufacturing (or 3D printing), known as a family of processes that joins materials to fabricate objects in a layer-by-layer fashion, is a powerful approach for the manufacturing of multifunctional systems. This talk presents an overview of our current research effort on the design of smart composites and the development of advanced additive manufacturing platforms featuring multi-material printing and robotic positioning systems. Examples of polymer-based composites featuring high mechanical stiffness and high temperature resistance, high electrical conductivity, piezoelectricity and printed structures with noise attenuation will be presented. The targeted applications are oriented toward the transportation, aerospace, microelectronics and biomedical fields.

Biography: Professor Daniel Therriault is a full professor in the Mechanical Engineering Department at Polytechnique Montreal. He currently holds two Chairs: a Canada Research Chair on the fabrication of advanced microsystems and materials, and the Safran-Polytechnique Industrial Chair on the additive manufacturing of reinforced polymers. He is co-director of the Laboratory for Multiscale Mechanics (LM2). His research interests are mainly related to additive manufacturing of advanced materials and multifunctional composites. Past contributions include the development of innovative additive manufacturing processes (e.g., freeform printing), the design and fabrication of nanocomposite materials for advanced aerospace applications, the 3D printing of carbon fiber-reinforced thermoplastic composites, etc. Several important scientific contributions (~80 refereed papers) in prestigious journals such as Nature materials, Advanced Materials and Small, and multiple innovations (7 Patents) originated from the research activities of Prof. Therriault's research team. He worked or is working on many collaborative research projects with partners such as Safran Group, Bombardier, Bell Textron Helicopter, 3M, Hutchinson, and the Canadian Space Agency. His current team is currently composed of 3 full-time RA, 1 part-time technician, 4 PDF, 10 PhD, 7 MS, and several undergraduate students.



Acoustic black hole structures and their applications in vibration damping and noise reduction

Jinhao QIU
Nanjing University of Aeronautics and Astronautics

Abstract: Acoustic black hole (ABH) effect utilizes the gradient variance of the structural configuration or material properties to realize the diminishing wave velocity in the structure. The wave velocity decreases to zero in an ideal scenario, resulting in zero reflection. The main method to realize the ABH structure is to adjust the structure through proper thickness tailoring in order to achieve energy capture in a certain area. It shows great advantages and potential application for flexural wave manipulation in thin-walled structure because of its high efficiency, broadband characteristic and flexible implementation. In this talk, the recent progress in modeling, analysis, implementation and measurement of ABH structures and their applications in wave manipulation, vibration damping and noise reduction is introduced. The topics in modeling, analysis, implementation and measurement of ABH structures include semi-analytical wavelet method for one-dimensional ABHs, FEM methods for two-dimensional ABHs and wave field visualization based on laser ultrasonic method. Applications of ABH structures include enhancement of energy harvesting, vibration damping based on energy focalization and ABH-based wide-band dynamic vibration absorber. Examples of cavity noise reduction using ABH panel is also introduced. Finally, the implementation of a one-dimensional ABH based on material stiffness gradation is demonstrated.

Biography: Professor Jinhao Qiu is Deputy Director, State Key Laboratory of Mechanics and Control of Mechanical Systems. He received the Bachelor and Master degrees in mechanical engineering from Nanjing University of Aeronautics and Astronautics, China, in 1983 and 1986 respectively, and the PhD degree in mechanical engineering from Tohoku University, Japan in 1996. He was a research associate from 1986 to 1989 and lecturer 1990 to 1991 at Department of Mechanical Engineering, Nanjing University of Aeronautics and Astronautics. He was a faculty member at the Institute of Fluid Science, Tohoku University from 1992 to 2006, where he was a research associate from 1992 to 1998, an assistant professor 1998 to 2000, an associate professor from 2000 to 2004 and a professor from 2004 to 2006. Since March, 2006, he is a Changjiang Chair Professor at the Nanjing University of Aeronautics and Astronautics. In 2011, he was selected to "The Recruitment Program of Global Experts". His main research interest is smart materials and structural systems, including development of piezoelectric materials and devices, vibration and noise control, structural health monitoring, and non-destructive testing. He has published more than 300 journal papers (including more than 230 SCI-indexed journal papers), 12 review papers, and more than 260 conference papers. He has also received 8 awards, including The 2002 Annual Dynamics, Measurement and Control Awards for Pioneering Achievements in the research of smart materials and structural systems from The Japan Society of Mechanical Engineers. He is the associate editor of Journal of Intelligent Material Systems and Structure, member of the editorial board of International Journal of Applied Electromagnetics and Mechanics and other four journals. He became ASME Fellow in 2014.

Program

Monday, October 07, 2019		
15:00 – 18:00	Registration	MB 9*
Tuesday, October 08, 2019		
8:00 – 8:20	Opening Remarks	MB 9 – Rooms C & D
Plenary Speaking Chair: Ramin Sedaghati		MB 9 – Rooms C & D
8:20 – 9:00	Smart and Adaptive 4D Materials – Hierarchical Manufacturing Hani Naguib, University of Toronto, Toronto, ON, Canada	
Session 1 – Noise and Vibration Control I Chair: George A. Lesieutre		MB 9 – Rooms C & D
9:00 – 9:20	Stiffness Modulation as a Method for Vibration Reduction Alexander Nowak, L. Flavio Campanile, and Alexander Hasse, Chemnitz University of Technology, Chemnitz, Germany	
9:20 – 9:40	On the Calculation and Control of Structural Intensities to Reduce Sound Transmission through Thin Walled Structures Michael Rose and Alexander Kokott, German Aerospace Center (DLR), Brunswick, Germany	
9:40 – 10:00	Vibration Control of MRE Isolator-embedded Smart Building using Genetic Algorithm Yang Yu, Yancheng Li, Jianchun Li, Thuc N. Nguyen, and Shaoqi Li, University of Technology Sydney, Sydney, Australia Emre Erkmen, Concordia University, Montreal, QC, Canada	
10:00 – 10:20	Coffee Break	MB 9 - Lobby
Session 2 – Smart Structural Systems I Chair: Ruxandra Mihaela Botez		MB 9 – Rooms C & D
10:20 – 10:40	Effect of Parametric Uncertainties on Vibration Mitigation of a Rod with Interconnected Piezoelectric Patches Marcelo A. Trindade, University of São Paulo, Sao Paulo, Brazil Boris Lossouarn and Jean-François Deü, Conservatoire national des arts et métiers (Cnam), Paris, France	
10:40 – 11:00	Nonlinear Frequency Analysis of Hair Cell Bundle Structure with Negative Stiffness Characteristic Gi-Woo Kim and Mai Van Ngoc, Inha University, Incheon, South Korea	
11:00 – 11:20	Shock Reduction on a Thin Plate using Elastic Wave Dispersion Patch Dae-Hyun Hwang and Jae-Hung Han, KAIST, Daejeon, South Korea	
11:20 – 11:40	Digital Twin Model Proposal for an Automotive Chassis Jorge de Jesús Lozoya-Santos, Andrés Campos Ferreira, Adriana Vargas Martínez, Ruben Morales-Menendez, Ricardo A. Ramirez-Mendoza, Tecnológico de Monterrey, Monterrey, Mexico Juan Carlos Tudón-Martinez, Universidad de Monterrey, Monterrey, Mexico	
11:40 – 12:00	Multi-material Topology Optimization of Structures using Peridynamics A. Sohoulí and A. Suleman, University of Victoria, Victoria, BC, Canada A. Kefal, Istanbul Technical University/ Sabanci University, Istanbul, Turkey M. Yildiz, Sabanci University, Istanbul, Turkey	
12:00 – 13:20	Lunch	MB 9 – Rooms A & B

Tuesday, October 08, 2019 (continued)

Plenary Speaking

Chair: Sobhash Rakheja

MB 9 – Rooms C & D

13:20 – 14:00 **Integrated Design of Magnetorheological Fluid and Energy Absorbers for Optimal System Performance**

Norman Wereley, University of Maryland, College Park, MD, USA

Session 3 – Energy Harvesting I

Chair: Jean-Sébastien Plante

MB 9 – Rooms C & D

14:00 – 14:20 **Design of a DC-DC Converter Applying Earthquake Algorithm for Inductance Selection**

Efrain Mendez-Flores, Alexandro A. Ortiz-Espinoza, Israel Macias-Hidalgo, Miguel de J. Ramirez-Cadena, Adriana Vargas-Martinez, Jorge de J. Lozoya-Santos, Ricardo Ramirez-Mendoza, Arturo Molina-Gutierrez and Juan C. Tudón-Martínez, Tecnológico de Monterrey, Monterrey, Mexico

14:20 – 14:40 **Energy Harvesting from Human Motions Considering User Effort**

Wei-Hsin Liao, The Chinese University of Hong Kong, Hong Kong, China

14:40 – 15:00 **Compressive-mode Piezoelectric Energy Harvesting**

Zhengbao Yang, City University of Hong Kong, Hong Kong, China

15:00 – 15:20 **Importance of Cross-sectional Model in Piezoelectric Beam-type Energy Harvester Analysis**

Shreya Banerjee, BMS Institute of Technology and Management, Bangalore, India
P M G B Asdaque and Sitikantha Roy, Indian Institute of Technology Delhi, New Delhi, India

15:20 – 15:40 **Coffee Break**

MB 9 - Lobby

Session 4 – Integration of Sensors and Actuators I

Chair: Fred Afagh

MB 9 – Rooms C & D

15:40 – 16:00 **Runnability Improvement of the Moon Rover with Leg-circle Transformable Wheel**

Ayako Torisaka, Kohei Eguchi, Satoshi Miura, Victor Parque, and Tomoyuki Miyashita, Tokyo Metropolitan University, Tokyo, Japan

16:00 – 16:20 **Incorporating Sensing Capability in an Electrorheological Haptic Module**

Alex Mazursky and Jeong-Hoi Koo, Miami University, Oxford, OH, USA
Tae-Heon Yang, Korea National University of Transportation, Chungbuk, Republic of Korea
Sam-Yong Woo, Korea Research Institute of Standards and Science, Daejeon, Republic of Korea

16:20 – 16:40 **Development of PZT Fiber Sensor Array to Locate Acoustic Source**

Bao Ha and Gang Wang, University of Alabama in Huntsville, Huntsville, AL, USA

16:40 – 17:00 **Smart Elastomers for the Sensing of Force and Vibration: A Proof of Concept**

Jorge de Jesús Lozoya-Santos, Adriana Vargas Martínez, Ruben Morales-Menendez, Ricardo A. Ramirez-Mendoza, and Armando Roman-Flores, Tecnológico de Monterrey, Monterrey, Mexico
Juan Carlos Tudón-Martínez, Universidad de Monterrey, Monterrey, Mexico

17:00 – 17:20 **An Optical RGB Sensor for Monitoring the Degradation of Magnetorheological Fluids in High-torque Clutch Actuators**

Benoit Gillet, Mathieu Lamy, Alexandre Landry-Blais, Raphaël Pilon, and Jean-Sébastien Plante, Université de Sherbrooke, Sherbrooke, QC, Canada

17:20 – 17:40 **Hilbert-huang Transform on Piezoelectric-Piston Synthetic Jet**

Zhang Li, Li Hongsheng, Lu Hong, and Long Li, Nanjing Institute of Technology, Nanjing, China

17:40 – 18:00 **Development of a Multi-axis Active Seat Mount System for Helicopter Aircrew Whole-body Vibration Reduction**

Jason Chang, Amin Fereidooni, Viresh Wickramasinghe, and Yong Chen, National Research Council of Canada, Ottawa, ON, Canada

18:30 – 20:30 **Welcome Reception**

MB 9 – Room E, F & G

Wednesday, October 09, 2019

Plenary Speaking

Chair: Masoud Hemmatian

MB 9 – Rooms C & D

8:00 – 8:40

Design of Multifunctional Composites and their Advanced Additive Manufacturing

Daniel Therriault, Polytechnique Montréal, Montréal, QC, Canada

Session 5 – Morphing Structures I

Chair: Jae-Hung Han

MB 9 – Rooms C & D

8:40 – 9:00

Control of a Full-scale Portion of a Regional Aircraft Morphable Wing

Duc-Hien Nguyen and Ruxandra Mihaela Botez, École de Technologie Supérieure, Montréal, QC, Canada
Teodor Lucian Grigorie, École de Technologie Supérieure, Montréal, QC, Canada and Military Technical Academy “Ferdinand I”, Bucharest, Romania
Mahmoud Mamou and Yousef Mébarki, National Research Council of Canada, Ottawa, ON, Canada

9:00 – 9:20

Investigation on a Morphing Winglet Driven by Differential Retractable Grid

Wei Li, Shanghai University of Engineering Science, Shanghai, China
Ke Xiong, Nanjing University of Aeronautics and Astronautics, Nanjing, China

9:20 – 9:40

Analysis of Cylindrical Tensegrities for Use in a Morphing Boom

Kaila Roffman and George A. Lesieutre, The Pennsylvania State University, University Park, PA, USA

9:40 – 10:00

Coffee Break

MB 9 - Lobby

Session 6 – Shape Memory Materials I & Bioinspiration and Bioengineering I

Chair: Eugenio Dragoni

MB 9 – Rooms C & D

10:00 – 10:20

Tailoring the Flexural Response of Sandwich Structures with Faces Made from Shape Memory Alloy Composite Actuators

Luke Mizzi, Andrea Spaggiari, and Eugenio Dragoni, University of Modena and Reggio Emilia, Reggio Emilia, Italy

10:20 – 10:40

3D Printing to Automate Shape Memory Alloy Placement in Composite Structures

Sampada Bodkhe and Paolo Ermanni, ETH Zurich, Zurich, Switzerland
Lorenzo Vigo, EPFL, Lausanne, Switzerland

10:40 – 11:00

Constitutive Model of the Correlation Between the Applied Stress, Strain and Electrical Resistance of SMA Actuator

Xin Xiang Jiang, Brian Lynch, Alex Ellery, and Fred Nitzsche, Carleton University, Ottawa, ON, Canada

11:00 – 11:20

Shape Memory Polymer Composites and 4D Printing Technologies: From the Aerospace to Flexible Electronics

Jinsong Leng and Yanju Liu, Harbin Institute of Technology, Harbin, China

11:20 – 11:40

Impact of Thermally Sensitive Self-adaptive Structures on the Performance of a Cooling Device

M. Vilarrubí, J. Rosell, and J. Barrau, University of Lleida, Lleida, Spain
L. G. Fréchette, Université de Sherbrooke, Sherbrooke, QC, Canada

11:40 – 12:00

Analysis, Simulation and Comparison of an Exoskeleton for Rehabilitation of Lower Limbs using Different Materials for its Manufacture

C. Hernández-Santos and Juan C. Tudón-Martínez, Universidad de Monterrey, Monterrey, Mexico
Fermín C. Aragón, Adriana Vargas-Martínez, Jorge de J. Lozoya-Santos, and Ricardo Ramírez-Mendoza, Tecnológico de Monterrey, Monterrey, Mexico

12:00 – 13:20

Lunch

MB 9 – Rooms A & B

IOC Meeting

MB 9 – Room F

Wednesday, October 09, 2019 (continued)

Plenary Speaking

Chair: Eric Chen

MB 9 – Rooms C & D

13:20 – 14:00

Acoustic Black Hole Structures and their Applications in Vibration Damping and Noise Reduction

Jinhao QIU, Nanjing University of Aeronautics and Astronautics, Nanjing, China

Session 7 – Morphing Structures II & Structural Health Monitoring I

Chair: Haim Abramovich

MB 9 – Rooms C & D

14:00 – 14:20

Conceptual Design for the Actuation and Skin Integration of a Morphing Leading Edge

Amin Fereidooni, Jan Marchwica, Natalie Leung, Jaye Mangione, and Viresh Wickramasinghe, National Research Council of Canada, Ottawa, ON, Canada

14:20 – 14:40

A Morphing Winglet Concept with a Variable Stiffness Skin

Jian Sun, Harbin Institute of Technology, Harbin, China and University of Bristol, Bristol, UK
Linze Du, Yanju Liu, and Jinsong Leng, Harbin Institute of Technology, Harbin, China
Fabrizio Scarpa, University of Bristol, Bristol, UK

14:40 – 15:00

Surrogate Model of the Aerodynamic, Structural and Mass Properties of a Shape Adaptive Airfoil for the blade of the Bo105 Helicopter

Stephane Fournier and Benjamin K. S. Woods, University of Bristol, Bristol, UK

15:00 – 15:20

Fault Diagnosis of Adaptive Structures using Mahalanobis-taguchi System

Hiroshi Okubo, Toui Ushiku, and Marika Satoh, Kanagawa Institute of Technology, Atsugi, Japan

15:20 – 15:40

Time-reversal Imaging Method based on Laser Ultrasonic Guide Waves with Temporal Filter Method

Chenguang Xu, Ying Luo, and Baiqiang Xu, Jiangsu University, Zhenjiang, China

15:40 – 16:00

Coffee Break

MB 9 - Lobby

Session 8 – Electro/Magneto Sensitive Materials I & Multifunctional materials and Composites I

Chair: Wei-Hsin Liao

MB 9 – Rooms C & D

16:00 – 16:20

Shear Behaviour of Magnetorheological Elastomers: Viscoelastic and Magnetorheological Properties

Andrea Spaggiari and Alberto Bellelli, University of Modena and Reggio Emilia, Reggio Emilia, Italy

16:20 – 16:40

Behaviours of Lithium-based Magnetorheological Grease under Triangular Quasi-static Test

Huixing Wang, Guang Zhang, and Jiong Wang, Nanjing University of Science and Technology, Nanjing, China
Yancheng Li, Nanjing Tech University, Nanjing, China and University of Technology Sydney, Sydney, Australia
Jianchun Li, University of Technology Sydney, Sydney, Australia

16:40 – 17:00

The Influence of GFRP Web Reinforcement on the Structural Behaviour of Deep Beams

Fawzi Latosh and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada

17:00 – 17:20

Design and Analysis of the Mechanical Properties of 3D Printed Sinusoidal Structures with Auxetic Characteristics

Diego A. Quevedo-Moreno, Armando Román-Flores, Enrique Cuan-Urquizo, Marcos D. Moya-Bencomo, Adriana Vargas-Martínez, and Ricardo Ramírez-Mendoza, Tecnológico de Monterrey, Monterrey, Mexico

17:20 – 17:40

Aerodynamic Control via Multifunctional Composite Kirigami Skins

Lawren L. Gamble, University of Michigan, Ann Arbor, MI, USA
Aaron Lamoureux, SpaceX, Hawthorne, CA, USA

17:40 – 18:00

Tuning the Hygro-mechanical Response of Paper-based Systems using Glycerol

Isaias Cueva-Perez, Roque Alfredo Osornio-Rios, Aurelio Dominguez-Gonzalez, and Angel Perez-Cruz, Universidad Autonoma de Queretaro, San Juan del Rio, Mexico

18:00 – 18:20

The Effect of Adding CNT by Direct Compounding Versus Dilution of a Masterbatch on the Elastic and Electrical Properties of PP Copolymer Composites

Erika Palacios-Aguilar, Jaime Bonilla-Ríos, Adriana Vargas-Martínez, Jorge de J Lozoya-Santos, and Ricardo Ramírez-Mendoza, Tecnológico de Monterrey, Monterrey, Mexico
José Antonio Sánchez-Fernández, Centro de Investigación en Química Aplicada, , Saltillo, Mexico

Thursday, October 10, 2019 – Student Presentations[†]

	Session 9 – Electro/Magneto Sensitive Materials II & Shape Memory Materials II Chairs: Jorge de Jesús Lozoya-Santos and Zhengbao Yang MB 9 – Rooms C	Session 10 – Structural Health Monitoring II Chairs: Roeland De Breuker and Hiroshi Okubo MB 9 – Rooms D
8:00 – 8:15	On the Role of Shape Factor on the properties of Magnetorheological Elastomers in Compression Mode Hossein Vatandoost, Masoud Hemmatian, Ramin Sedaghati, and Subhash Rakheja, Concordia University, Montreal, QC, Canada	Predictive Analytics of Structural Lateral Distribution Performance for an in-service Simply Supported Girder Bridge Qiwen Jin, Hefei University of Technology, Hefei, China Zheng Liu, University of British Columbia, Kelowna, BC, Canada
8:15 – 8:30	Enhancement of MR-effect in Magnetorheological Elastomers through Bi-layer Composition: Theory and Validation Ali Alkhalaf, Amir Hooshair, and Javad Dargahi, Concordia University, Montreal, QC, Canada	Crack Friction-based Entropy Generation Monitoring During the Fatigue Lifetime of Composite Materials using Thermoelastic Stress Analysis Ricardo Marques and Afzal Suleman, University of Victoria, Victoria, BC, Canada Mehmet Yildiz, Sabanci University, Istanbul, Turkey
8:30 – 8:45	Dynamic Characterization of Magnetorheological Elastomers based on hard Magnetic Particles under Harmonic Loading Nader Mohseni, Masoud Hemmatian, and Ramin Sedaghati, Concordia University, Montreal, QC, Canada	Estimation of the Capacity of a Bridge Deck and the Bridge Superstructure System Based on Ground Penetrating Radar Imaging Dipesh Donda, Farzad Ghodoosi, and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada
8:45 – 9:00	A Linear Model for Magnetoactive Elastomers Alireza Beheshti, Ramin Sedaghati, and Subhash Rakheja, Concordia University, Montreal, QC, Canada	Automated Visual Assessment of Structural Conditions by FE Model Updating using Building Information Modeling (BIM) S. Bahmanoo, M. Valinejadshoubi, F. A. Sakib, A. Sabamehr, A. Bagchi, and A. Bhowmick, Concordia University, Montreal, QC, Canada
9:00 – 9:15	On the Effects of Pre-strain on Dynamic Behavior of Magnetorheological Elastomers in Compression Mode Hossein Vatandoost, Masoud Hemmatian, Ramin Sedaghati, and Subhash Rakheja, Concordia University, Montreal, QC, Canada	SHM Point Arrangement for in-service Continuous Bridge with Consideration of Structural Robustness Qiwen Jin, Hefei University of Technology, Hefei, China Zheng Liu, University of British Columbia, Kelowna, BC, Canada
9:15 – 9:30	Training for Adaptive Three-dimensional SMA Bumps with Two-way Shape Memory Effect Chen Zhang, Hongli Ji, Lin Hao, and Jinhao Qiu, Nanjing University of Aeronautics and Astronautics, Nanjing, China	Experimental Broadband Signal Reconstruction for Plate-like Structures Nicolas Venturini, Clarkson University, Potsdam, NY, USA and University of Bologna, Bologna, Italy Marcias Martinez, Clarkson University, Potsdam, NY, USA and Delft University of Technology, Delft, Netherlands Enrico Troiani and Francesco Falcetelli, University of Bologna, Bologna, Italy Maria Barroso-Romero, Delft University of Technology, Delft, Netherlands
9:30 – 9:45	Influence of Vacuum and Low Temperature on Deployment Performance of Shape Memory Polymer Composite Hinges Van Luong Le, Yiyuan Liu, Vinh Tung Le, and Nam Seo Goo, Konkuk University, Seoul, Korea	Vibration-based Damage Detection in a Cable-stayed Bridge Zahrasadat Momeni and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada
9:45 – 10:00	Damping Characteristics of SCSMA Vibration Isolator Kasumi Hayashi, Shimpei Sato, Moe Kawamura, Nobuhisa Katsumata, and Ken Higuchi, Murooran Institute of Technology, Murooran, Japan	System Identification of Concordia University EV Building by Operational Modal Analysis Saikat Bagchi, Ardalan Sabamehr, Timir Baran Roy, and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada
10:00 – 10:15	Coffee Break	

MB 9 - Lobby

Thursday, October 10, 2019 – Student Presentations (continued)

Thursday, October 10, 2019 – Student Presentations (continued)		
	Session 11 – Integration of Sensors and Actuators II Chairs: Marcias Martinez and Ayako Torisaka MB 9 – Rooms C	Session 12 – Noise and Vibration control II & Morphing Structures III Chairs: Andrea Spaggiari and Luke Mizzi MB 9 – Rooms D
10:15 – 10:30	Experimental Characterization of Pull-in Parameters for an Electrostatically Actuated Cantilever Andrea Sorrentino, Giovanni Bianchi, Davide Castagnetti, and Enrico Radi, University of Modena and Reggio Emilia, Reggio Emilia, Italy	Response Modification Factors for Friction Dampers as per the 2015 National Building Code of Canada Ali Naghshineh and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada Fariborz M Tehrani, California State University, Fresno, CA, USA Oscar Romero Galindo, Quake Tek Inc., Montreal, QC, Canada
10:30 – 10:45	Design, Prototyping and Validation of a New PVDF Acoustic Sensor Andrea Sorrentino, Yuri Ricci, Davide Castagnetti, and Luca Larcher, University of Modena and Reggio Emilia, Reggio Emilia, Italy	Aero-engine Vibration Transfer Path Analysis Seyed-Ehsan Mir-Haidari and Kamran Behdinan, University of Toronto, Toronto, ON, Canada
10:45 – 11:00	Global-local Deformation Measurement using Multi Digital Image Correlation System Taijun Zhao, Vinh Tung Le, and Nam Seo Goo, Konkuk University, Seoul, Korea	Optimal Magnetorheological Damper for Two-Wheeled Vehicle Manjeet Keshav, Eashan Dhawade, and Sujatha Chandramohan, Indian Institute of Technology Madras, Chennai, India
11:00 – 11:15	Design and Experimental Validation of a Haptic Glove and Robotic Arm Powered by Magnetorheological Actuators for Dexterous Object Manipulation in VR Benjamin Bedard, Louis-Philippe Lebel, Bruno-Pier Busque, Marc Denninger, Guifré Julio, Alexandre Girard, and Jean-Sébastien Plante, Université de Sherbrooke, Sherbrooke, QC, Canada	Intelligent Resonance Identification and Vibration Suppression for Industrial Robots Michael Newman, Ehsan Jalayeri, and Matt Khoshdarregi, University of Manitoba, Winnipeg, MB, Canada
11:15 – 11:30	Experimental Assessment of a Linear Actuator Driven by Magnetorheological Clutches for Automotive Active Suspensions William East, Jérôme Turcotte, and Jean-Sébastien Plante, Université de Sherbrooke, Sherbrooke, QC, Canada	Dynamic Analysis and Design Optimization of a Light-Weight Magnetorheological Elastomer-based Adaptive Vibration Absorber Mostafa Asadi Khanouki, Ramin Sedaghati, and Masoud Hemmatian, Concordia University, Montreal, QC, Canada
11:30 – 11:45	Embedded SiC Fiber Sensor based Low-velocity Impact Monitoring of Composite Structures Hyunseok Kwon, Yurim Park, and Chun-Gon Kim, KAIST, Daejeon, Republic of Korea	The Effectiveness of Distributed Tuned Mass Damper Integrated with Adaptive MR Damper in Building A. Bagchi and A. Torkaman Rashid, Concordia University, Montreal, QC, Canada
11:45 – 12:00	A Gripping Force Self-sensing Microgripper with Jaws based on Optical Fiber Fabry-Perot Interferometers Dai-Hua Wang, Jian-Yu Zhao, Jin-Long He, and Jie Wang, Chongqing University, Chongqing, China	A Finite Element Analysis of a Gull Wing through Varied Morphed Configurations Christina Harvey and Daniel J. Inman, University of Michigan, Ann Arbor, MI, USA
12:00 – 13:15	Lunch	
	MB 9 – Rooms A & B	
	Session 13 – Bioinspiration and Bioengineering II Chairs: Jeong-Hoi Koo and Amin Fereidooni MB 9 – Rooms C	Session 14 – Energy Harvesting II Chairs: Jean-François Deü and Lawren Gamble MB 9 – Rooms D
13:15 – 13:30	Biodegradable Starch-based Materials for Wound Dressing, Monitoring, and Healing M. Mohsen Delavari and I. Stiharu, Concordia University, Montreal, QC, Canada A. Perez-Cruz, Autonomous University of Queretaro, Santiago de Querétaro, Mexico	A Frequency Adaptive Package Design for Micro Piezoelectric Energy Harvesters Guan-Yu Ke, Cheng-Hsiang Hsu, Yu-Chun Kuo, Wei-Ting Shih, Chao-Ting Chen, Shun-Chiu Lin, and Wen-Jong Wu, National Taiwan University, Taipei, Taiwan
13:30 – 13:45	Design of Bypass Rotary Vane Magneto Rheological Damper for Prosthetic Knee Application Radhe Shyam Saini Tak and Hemantha Kumar, National Institute of Technology Karnataka, Mangalore, India Sujatha Chandramohan and Sujatha Srinivasan, Indian Institute of Technology Madras, Chennai, India	Power Output Enhancement of Piezoelectric Energy Harvesters using Electrode Coverage Optimization Peyman Hajheidari, Ion Stiharu, and Rama Bhat, Concordia University, Montreal, QC, Canada

13:45 – 14:00	Kinematic Analysis and Position Control of a Flexible Tendon-driven Catheter for Minimally Invasive Cardiac Surgery Mohammad Jolaei, Amir Hooshair, and Javad Dargahi, Concordia University, Montreal, QC, Canada	Investigation into Piezo-magneto-elastic Energy Scavenger with Exponentially Tailored Geometry Mahdi Derayatifar, Ramin Sedaghati, Muthukumaran Packirisamy, and Rama Bhat, Concordia University, Montreal, QC, Canada
14:00 – 14:15	Coffee Break MB 9 - Lobby	
	Session 15 – Integration of Sensors and Actuators III & Multifunctional materials and Composites II Chairs: Mehdi Eshaghi and Abdolrasoul Sohoul MB 9 – Rooms C	Session 16 – Smart Structural Systems II Chairs: Aurelio Dominguez-Gonzalez and Yanju Liu MB 9 – Rooms D
14:15 – 14:30	A PCB Process based Piezoelectric Pump Actuated by Circular Piezoelectric Unimorph Actuators (CPUAs) with Low Natural Frequency Dai-Hua Wang, Yun-Hao Peng, Lian-Kai Tang, and Meng-Zhen Wang, Chongqing University, Chongqing, China	Multi-mode Piezoelectric Shunt Damping of Plate-like Structures Johan Frederik Toftekær and Jan Høgsberg, Technical University of Denmark, Kgs. Lyngby, Denmark
14:30 – 14:45	Microcantilever Sensor for Biochemical Reaction Detection Shervin Foroughi, Jeetender Amritsar, Durai Chelvan, Shanmugamsundaram Packirisamy, and Muthukumaran Packirisamy, Concordia University, Montreal, QC, Canada	Investigating the Performance of Multiple Tuned Mass Dampers on Long Span Cable Stayed Bridge under Multiple Support Excitation Zahrasadat Momeni and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada
14:45 – 15:00	Polymer Gels: Investigation of the Swelling Induced Deformations with a Thermodynamically Consistent Chemo-mechanical Model Marco Rossi and Thomas Wallmersperger, Technische Universität Dresden, Dresden, Germany Paola Nardinocchi, Sapienza Università di Roma, Rome, Italy	Seismic Performance of Concrete Moment Resisting Frames in Western Canada Ali Naghshineh and Ashutosh Bagchi, Concordia University, Montreal, QC, Canada
15:00 – 15:15	Rapid Direct Deposition of Filled Polymer on Non-planar Surface Jean-François Chauvette and Daniel Therriault, Polytechnique Montreal, QC, Canada Nicola Piccirelli, Safran Composites, Itteville, France	
15:45 – 18:45	Montreal City Tour [‡]	
19:00 – 21:00	Banquet [§] VIEUX-PORT STEAKHOUSE	

* Concordia University Conference Center (MB 9) is located at John Molson Building, 1450 Guy St., Montreal, Quebec, Canada, H3H 0A1.

† Student presentations will be evaluated, and the best student presentations will be awarded by ICAST 2019 at the Banquet.

‡ Montreal City Tour incorporates the must-see highlights of the city in few hours. The guided tour will be started from the downtown and be finished in Old Montreal. The bus will begin boarding at 15:30 at Concordia University (Hall Building, 1455 Boulevard de Maisonneuve West, Montreal, QC, H3G 1M8) for a 15:45 departure. The tour will be finished at 18:45 at VIEUX-PORT STEAKHOUSE (39, Rue Saint-Paul Est, Montreal, QC, H2Y 1G2). It should be noted that the pre-registration is required for the Montreal City Tour. For those who did not pre-register, limited tickets are available at the reception desk on a first-come, first-served basis.

§ Join us for a special evening at VIEUX-PORT STEAKHOUSE (39, Rue Saint-Paul Est, Montreal, QC, H2Y 1G2). For those who did not attend the Montreal City Tour, a bus will begin boarding at 18:15 at Concordia University (Hall Building, 1455 Boulevard de Maisonneuve West, Montreal, QC, H3G 1M8) for a 18:30 departure. A bus will depart back to Concordia University at 21:30.

Bus Departure:
Concordia University, Hall Building

Concordia University Conference Center (MB 9)



