

EMI 2022

**Technical
Program**

Parallel Technical Sessions

Wednesday, June 1

TS 1: WEDNESDAY MORNING, JUNE 1

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Hodson 210	#M101	The Next Frontiers in Natural Hazards Engineering: Advancing the Vision of Ahsan Kareem, Chair(s): Alexandros Taflanidis			
<p>Keynote presentation: Connecting the History and the Future of Tall Buildings</p> <p><i>Tracy Kijewski-Correa*</i></p>		<p>Let's Continue to Share This Path Together to Build an Even Better Future</p> <p><i>Yukio Tamura*</i></p>	<p>A Vision of Engineering Education Inspired by the Career of Ahsan Kareem</p> <p><i>Fred Haan*</i></p>	<p>Evidence Theory: What, Why and How in Engineering for Natural Hazards</p> <p><i>Ross B. Corotis*, William Seites-Rundlett, Cristina Torres-Machi</i></p>	<p>Hurricane-Resilient City: Markov Decision Process-Based Problem Formulation and Machine Learning-Based Solution</p> <p><i>Teng Wu, Shaopeng Li*</i></p>
Hodson 213	#M203	Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering, Chair(s): Lori Graham Brady			
<p>Symplectic Encoders for Variational Dynamics Inference</p> <p><i>Kiran Bacsa*, Zhilu Liu, Wei Liu, Eleni Chatzi</i></p>	<p>Probabilistic Event Localization Using Floor Vibrations</p> <p><i>Yohanna MejiaCruz*, Juan M. Caicedo, Zhaoshuo Jiang, Jean M. Franco</i></p>	<p>Bayesian Calibration of a Cluster Dynamics Model</p> <p><i>Pieterjan Robbe*, Tiernan Casey, Khachik Sargsyan, Habib Najm</i></p>	<p>Hybrid Mechanistic- and Data-Driven Estimation of Concrete Beam Shear Failure Mechanics</p> <p><i>Jacob Pavelka*</i></p>	<p>Structural Simulations via Finite Element Network Analysis</p> <p><i>Mehdi Jokar*, Fabio Semperlotti</i></p>	
Krieger 170	#M208	Mechanics and Physics of Granular Materials, Chair(s): Marcial Gonzalez			
<p>Introduction: Symposium on the Mechanics and Physics of Granular Materials</p>	<p>Graph Embedding Plasticity for Granular Solids</p> <p><i>Nikolaos Napoleon Vlassis*, WaiChing Sun</i></p>	<p>Analysis of Tapped Granular Systems Using Machine Learning Approaches</p> <p><i>Vishagan Rathaswamy, Anthony Rosato, Youngjin Chung, Noor Mili*, Denis Blackmore, Jonathan Dye</i></p>	<p>Active Learning Sensitivity Analysis for a Visco-Plastic Sand Breakage Model</p> <p><i>Dimitrios Tsapetis*, Mohit Chauhan, Michael Shields, Aaron Baumgarten, Nilanjan Mitra, Ryan Hurley, K.T. Ramesh</i></p>	<p>A Thermomechanical Framework for Modeling Fluid-Saturated, Brittle Granular Materials in Dynamic Flows with High Strain-Rates</p> <p><i>Aaron Baumgarten*, Nilanjan Mitra, Ryan Hurley, K.T. Ramesh</i></p>	<p>A Simple Constitutive Law for Comminuted Ceramics Under Multi-Axial Loading</p> <p><i>Bryan Love*</i></p>

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Krieger 180	#M210	Reduced-Order and Surrogate Models for Mechanics of Porous Media, Chair(s): Xiao-Hui Wu			
Use of Multifidelity Training Data and Transfer Learning for Efficient Surrogate Model Construction <i>Su Jiang*, Louis Durlofsky</i>	Learned Operator Surrogate Models for Parametric PDEs <i>Nicholas Nelsen*</i>	Learning Constitutive Relations in Multiscale Viscoelastic Materials <i>Kaushik Bhattacharya, Burigede Liu, Andrew Stuart, Margaret Trautner*</i>			
Hodson 313	#M211	Challenges and Advances in Material Damage Modeling, Chair(s): Mostafa Mobasher			
Modeling of Damage and Failure in Heterogeneous Brittle Solids Under High-Rate Compressive Loading <i>Sakshi Braroo*, K.T. Ramesh</i>	A Fast Solver to Peridynamic Models of Pitting Corrosion Damage <i>Longzhen Wang*, Siavash Jafarzadeh, Florin Bobaru</i>	Non-Local Continuum Modeling of Damage in Elastic and Viscoelastic Porous Media <i>Mostafa Mobasher*, Yijun Chen, Haim Waisman</i>	Two-Way Coupled Modeling of Rate-Dependent Deformation and Cracking in Heterogeneous Viscoelastic Solids <i>Yong-Rak Kim*, Santosh Kommidi, Jamilla Teixeira</i>	Poro-Damage Phase Field Damage Models for Hydraulic Fracture Propagation in Glaciers and Ice Shelves <i>Ravindra Duddu*, Xiangming Sun, Theo Clayton, Emilio Martinez-Paneda</i>	
Latrobe 120	#M213	Advances in Experimental, Theoretical, and Computational Fracture Mechanics, Chair(s): Ange-Therese Akono / Arturo Montoya			
Fatigue Response of Metakaolin-Based Geopolymer <i>Ange-Therese Akono*</i>	Low-Cycle Fatigue Performance of Cu-Al-Mn Superelastic Alloys Under Different Temperatures <i>Huanpeng Hong, Bora Gencturk*, Hadi Aryan, Amit Jain</i>	Fracture Toughness of Electrospun Nanofiber-reinforced Geopolymer Composites Using Scratch Tests <i>Yunzhi Xu*, Ping Guo, Ange-Therese Akono</i>	Adaptive Wavelet-Enhanced Cohesive Zone Phase-Field FE Model for Crack Evolution in Piezoelectric Composites <i>Saikat Dan*, Preetam Tarafder, Somnath Ghosh</i>	Coupled Crystal Plasticity Phase-Field Model for Ductile Fracture in Polycrystalline Microstructures <i>Thirupathi Maloth*, Somnath Ghosh</i>	Finite Strain Ductile Phase Field Fracture Modeling of Steel Structures <i>Sina Abrari Vajari*, Matthias Neuner, Christian Linder</i>

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Hodson 316	#M219	Mechanics of Wood and Wood Based Materials, Chair(s): Markus Lukacevic			
Phase Field Method-Based Modeling of Fracture in Wood <i>Sebastian Pech*, Markus Lukacevic, Josef Füssl</i>	A Novel 3D Discrete Beam Lattice Model: from Mesostructure to Macroscopic Behaviors of Wood <i>Hao Yin*, Erol Lale, Gianluca Cusatis</i>	Damage Classification of Wood Samples Using Acoustic Emission Technique and Pattern Recognition Network <i>Parinaz Belalpour Dastjerdi*, Eric Landis</i>	Micromechanics of Non-Embedded Spruce Wood: Novel Polishing and Indentation Protocol <i>Luis Zelaya-Lainez*, Giuseppe Balduzzi, Christian Hellmich, Josef Füssl</i>	Multiparametric Cutting Force Prediction Model for Various Wood Species <i>Ondrej Dvoracek*, Daniel Lechowicz, Martin Hauser, Stephan Frybort</i>	
Krieger 304	#M222	6th Mini-Symposium on 4M (Modeling of Multiphysics-Multiscale-Multifunctional) Engineering Materials and Structures, Chair(s): Marte Gutierrez			
Multiscale Nonlocal Elasticity: A Distributed Fractional Order Formulation <i>Wei Ding*, Sansit Patnaik, Fabio Semperlotti</i>	PDEM Modeling of Borehole Stability in Transversely Anisotropic Rock <i>Marte Gutierrez*, Guowen Xu</i>	Experiments and Multiphysics Computational Modeling of Desiccation Behavior in Inorganic Microfiber-Reinforced Engineered Barrier Materials for Geological Repository of Nuclear Spent Fuel <i>Julia Grasley, Mohammad Rahmani*, Abdullah Azzam, Gabriel Nsengiyumva, Yong-Rak Kim, Jongwan Eun, Seunghee Kim</i>	Identification of Dam Leakage Using Hydrothermal Coupled Analysis and Distributed Temperature Sensing <i>Binyam Bekele*, Chung Song</i>	Modeling Cracks in Clay at the Nanoscale Through Full-Scale Molecular Dynamics <i>Zhe Zhang*, Xiaoyu Song</i>	Beyond Elastocapillary: The Elastic Plateau-Rayleigh Instability in Polymeric Gels <i>Berkin Dortdivanlioglu*</i>
Shaffer 202	#M228	Mitigating Risks of Large-Scale Lithium-Ion Batteries as Energy Storage Systems or Electric Vehicles in Urban Environments, Chair(s): Ali Ashrafi			
Fire and Explosion Testing of a Lithium-Ion Energy Storage System Mockup <i>Adam Barowy*</i>	Implications of Large-Scale Lithium-ion Indoor Energy Storage for Fire Safety in Urban Areas <i>Ali Ashrafi*, Mahesh Bailakanavar, Nezar Abraham</i>	Implications of Electric Vehicles for Fire Safety of Indoor Parking Spaces <i>Ali Ashrafi*, Mahesh Bailakanavar, Nezar Abraham</i>	EPRI's Battery Storage Fire Safety Roadmap <i>Dirk Long, Lakshmi Srinivasan*</i>		

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Hodson 303	#M229	Additive Manufacturing: Novel Processing, Design, Materials, Structures and Functions, Chair(s): Gianna Valentino			
Additively Graded Materials for Thermal Management <i>Sharon Park*, Alex Lark, Arunima Banerjee, Kevin Hemker, Gianna Valentino</i>	High Rates and Temperature Effects in Nanoindentation Testing on Hardness in SLM INC718 <i>George Z. Voyiadjis*, Reem Abo Znemah, Paul Wood</i>	Image-Based Experimental Investigation of Fatigue Crack Initiation and Small Crack Growth of Additively Manufactured Ti-6Al-4V <i>Changyu Meng*, Jie Chen, Luke Hase, Yongming Liu</i>	Thermal Modeling of Laser Powder Bed Fusion Additive Manufacturing of Refractory Materials <i>Li Ma*, Gianna Valentino, Mitra Taheri, Morgana Trexler</i>	Multi-Physics Modeling of Additive Manufacturing Processes via a Mixed Interface-Capturing/Interface-Tracking Approach <i>Jinhui Yan*, Qiming Zhu</i>	
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Manolis Chatzis			
Improved Finite Element Model Updating of a Full-Scale Steel Bridge Using Sensitivity Analysis <i>Bjørn T. Svendsen*, Øyvind W. Petersen, Gunnstein T. Frøseth, Anders Rønnquist</i>	Crack Detection, Location, Quantification, and Visualization Using a Distributed Fiber Optic Sensor Based on Optical Frequency Domain Reflectometry <i>Xiao Tan*, Yi Bao</i>	Long-Term Dynamic Strain Monitoring of a 110-Years-Old Steel Railway Bridge: Influence of Damage vs. Temperature <i>Dimitrios Anastasopoulos*, Guido De Roeck, Edwin Reynders</i>	Vibration-Based Assessment of Local Damage in Prestressed Concrete Beams Based on Joint Acceleration and FBG Strain Data <i>Menno Van de Velde*, Edwin Reynders, Geert Lombaert</i>	Damage Sensitivity Features in Steel-Concrete Composite Beams Under Moving Loads <i>Mariateresa Lombardo*, Giuseppe Marano, Alessandro Palmeri</i>	Demonstrating the Value of Vibration-Based Structural Health Monitoring Across Different Time Scales <i>Antonios Kamariotis*, Eleni Chatzi, Daniel Straub</i>
Shaffer 100	#M306	Practical Applications and Value of Advanced Computational and Probabilistic Modelling in the Life-Cycle of Structures, Chair(s): Paolo Bocchini			
Reliability Centered Rehabilitation Optimization for Concrete Hydraulic Structures. <i>Arslan Tahir*, Claus Kunz</i>	Structural Topology Optimization Using an Enhanced and Robust Genetic Algorithm <i>Xingjian Wang*, Clay Naito, John Fox, Paolo Bocchini</i>	Assessing the Current and Future Probability of Hurricane Ida's Blackout-Heatwave Compound Hazard <i>Kairui Feng*, Ning Lin, Avantika Gori, Dazhi Xi, Min Ouyang, Michael Oppenheimer</i>	Effect of the Structural Wall Modeling in the Seismic Response of Buildings with Force-Limiting Connections Between Diaphragm-to-Wall Joints <i>Carlos Franco Mayorga*, Kyoungyeon Lee, Georgios Tsampras</i>	Decentralized Actor-Critic Deep Reinforcement Learning Approach for Optimal Life-Cycle Management of Transportation Networks <i>Mohammad Saifullah*, Charalampos Andriotis, Kostas Papakonstantinou, Shelley Stoffels</i>	Impact of FE Modelling Approach in the Long-Term Assessment of Prestressed Structures Based on Probabilistic Outcomes – Case Studies on T-Girder Beams <i>Emanuele Canestro*, Alfred Strauss, Helder Sousa</i>

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Hodson 305	#M308	Origami/Kirigami Inspired Structures and Metamaterials, Chair(s): Evgueni Filipov			
Out-of-Plane Compressive Stiffness of Spin-Valence Kirigami Units <i>Isabel M. de Oliveira*, Sigrid Adriaenssens</i>	Shape-Fitting Origami with Curved Creases and Pinches <i>Steven Woodruff*, Evgueni Filipov</i>	Keynote presentation: Geometric Scaffolds for Knitting <i>Randall Kamien*</i>		Continuous Modeling of Creased Annular Strips with Tunable Bistable and Looping Behaviors <i>Tian Yu*, Francesco Marmo, Sigrid Adriaenssens</i>	Mechanics of Origami Bellows <i>Mengzhu Yang, Fabrizio Scarpa, Mark Schenk*</i>
Hodson 211	#M312	Structural Instabilities: From Failure to Function, Chair(s): Stylianos Yiatros			
Determination of Ultimate Capacities of In-Situ Prestressed Stayed Columns Through Probing <i>Luke Lapira*, Jiajia Shen, Ahmer Wadee, Rainer Groh, Leroy Gardner</i>	Investigation of the Buckling Instability in Free-Floating Thin-Shell Domes <i>Kieran Barvenik*, Zachary Coogan, Eleonora Tubaldi, Matteo Pezulla</i>	Application of Acceleration Amplitude Control and Voltage Control Tests to Strong and Weak Nonlinear Structures <i>Eric Robbins*, Fernando Moreu</i>	Exploring the Interaction Between Different Instability Phenomena in Vertical Axis Turbine Blades <i>Benjamin Terry*, Richard Wiebe, Michael Motley</i>	Stability Analysis of Rotary-Straightened Steel Members with Multiple Stiffness Reduction Models Using Machine Learning <i>Hyeyoung Koh*, Barry Rosson, Hannah Blum</i>	
Hodson 301	#M315	Coupled Chemical, Physical and Mechanical Processes in Cementitious Materials for Regular and 3D Printed Constructions, Chair(s): Mohammed Alnaggar / Roman Wan-Wendner			
Keynote presentation: What Does Irradiation do to Concrete? Insights on Effects at the Paste and Aggregate Levels <i>Elena Tajuelo Rodriguez*</i>		Bond Behavior of Irradiated Concrete with Reinforcing Rebars <i>Amani Cheniour*, Mohammed Alnaggar</i>	Finite Element Analysis of Chloride Ingress in Prestressed Bridge Girders <i>Mojtaba Aliasghar-Mamaghani*, Ioannis Koutromanos, Carin Roberts-Wollmann, Matthew Hebdon</i>	Permeability and Diffusivity Simulation Based on Gray Lattice Boltzmann Method Using 3D Microtomography of Cement Composites <i>Jongmin Rim*, Juhyuk Moon</i>	

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Hodson 315	#M403	20th Symposium on Biological and Biologically Inspired Materials and Structures, Chair(s): Dinesh Katti			
<p>Keynote presentation: Complex Biomechanics: from Atoms to Patients</p> <p><i>Christian Hellmich*, Stefan Scheiner, Johannes Kalliauer, Niketa Ukaj</i></p>	<p>Fluid Induced Migration of Prostate Cancer Cells Towards Bone Metastasis</p> <p><i>Kalpna Katti*, Haneesh Jasuja, Sharad Jaswandkar, Dinesh Katti</i></p>	<p>Engineering Complex Energy Landscapes with Magneto-Elastic Structures</p> <p><i>Sinan Keten*, Xinyan Yang</i></p>	<p>A Biomechanical Model for Ultrasound Elastography Imaging of Breast Cancer</p> <p><i>Mutaz Dwairy*, JN Reddy, Arun Srinivasa</i></p>		
Hodson 311	#M405	Inverse Problems – Theory and Applications, Chair(s): Loukas Kallivokas			
<p>An Approach for Soft Tissue Material Parameter Estimation from Clinical Imaging Data Using a Three-Dimensional Level Set Method</p> <p><i>Aminallah Poursaghar*, Timothy Wong, Marc Simon, John Brigham</i></p>	<p>Identification of Seismic Input Motions in a Near-Surface 2D Domain Subject to Unknown SH Incident Waves</p> <p><i>Bruno Guidio, Chanseok Jeong*</i></p>	<p>Inverse Design of Omnidirectional Shields for Band-Gapping Acoustic Waves in 3D</p> <p><i>Ke Ma*, Heedong Goh, Loukas Kallivokas</i></p>	<p>Wave-Source Inversion for the Detection of Moving Loads</p> <p><i>Stephen Lloyd*, Chanseok Jeong</i></p>	<p>Full-Waveform Inversion of Seismic Input Motions at a Domain Reduction Method Boundary in a Domain Truncated by PML</p> <p><i>Bruno Guidio*, Heedong Goh, Chanseok Jeong</i></p>	<p>Estimation on the Initial Imperfection of a Thin-Walled Copper Shell Structure</p> <p><i>Le Cao*</i></p>
Shaffer 300	#M407	Advances in Computational Methods for Uncertainty Quantification and Robust/Performance-Based Design of Structures and Systems Exposed to Natural and Man-Made Hazards, Chair(s): Seymour M.J. Spence			
<p>Development of Active-Learning-Based Surrogate Method for Estimating Reliability of Stochastic Wind-Excited Systems</p> <p><i>Jungho Kim*, Sang-ri Yi, Junho Song</i></p>	<p>Autoregressive Surrogate Models of High-Dimensional Time-Dependent Wind Turbine Simulations for Uncertainty Quantification</p> <p><i>Styfen Schär*, Stefano Marelli, Bruno Sudret</i></p>	<p>Multi-Fidelity Parallel Sequential Design Strategy Under Classification Constraints with CFD Applications</p> <p><i>Fei Ding*, Jize Zhang, Ahsan Kareem</i></p>	<p>Efficient Estimation of Wind-induced Nonlinear Responses with Prescribed Mean Recurrence Intervals through Limited Suites of Wind Records</p> <p><i>Srinivasan Arunachalam*, Seymour Spence</i></p>	<p>Assessment of Seismic Risk of Structures Using Manifold Learning-Based Surrogate Modeling</p> <p><i>Dimitris Giovanis*, Michael Shields, Alexandros Taflanidis</i></p>	

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Shaffer 302	#M601	The Sixth Mini-Symposium on Advanced Analysis for Earthquake Engineering, Chair(s): Kevin Wong			
<p>Selection of Simulated Earthquake Ground Motions for Nonlinear Analysis of Near-Fault Structures</p> <p><i>Maha Kenawy*, David McCallen</i></p>	<p>Impact of Detailing on the Lateral Performance of Cold-Formed Steel Framed Walls</p> <p><i>Zhidong Zhang*, Matthew Speicher, Amanpreet Singh, Tara Hutchinson, Benjamin Schafer</i></p>	<p>Numerical Simulation of 3D Printed Concrete Walls Under Mechanical Loads</p> <p><i>Hao Chen*, Mohammad Aghajani Delavar, Petros Sideris</i></p>	<p>Quantification of Seismic Energy Demand and Capacity of Nonlinear Structures</p> <p><i>Kevin Wong*</i></p>		
Latrobe 107	#M604	Advances in Quantitative Resilience and Sustainability, Chair(s): Meshkat Botshekan			
<p>A Potential of Mean Force-Based Lattice Element Method for Modeling Response of Structures</p> <p><i>Shayan Razi*, Mazdak Tootkaboni, Arghavan Louhghalam</i></p>	<p>Implementation of Machine Learning Models to Predict Storm Surge in Coastal Cities</p> <p><i>Mahmoud Ayyad*, Muhammad Hajj, Reza Marsooli</i></p>	<p>The Effect of Urban Texture on Flood Hazards</p> <p><i>Sarah Balaian*, Mohammad Javad Abdolhosseini Qomi, Brett Sanders</i></p>	<p>Towards a More Sustainable Road Transportation System: Application of Statistical Physics to Smartphone Data</p> <p><i>Meshkat Botshekan*, Mazdak Tootkaboni, Arghavan Louhghalam, Franz-Josef Ulm</i></p>	<p>HYBRID: HYper-Reduced Basis Reduction via Interactive Decomposition</p> <p><i>Esmaeil Rezaei*, Yanlai Chen, Negin Alemazkoor, Arghavan Louhghalam, Mazdak Tootkaboni</i></p>	<p>Modeling Damage for Resilience Assessment Under Natural Hazards: A Discrete Simulation Framework</p> <p><i>Soolmaz Khoshkalam*, Shayan Razi, Mazdak Tootkaboni, Arghavan Louhghalam</i></p>
Krieger 302	#M606	Resilience of Coastal Structures, Systems, and Community Subjected to Hazards, Chair(s): Wei Zhang / Jamie Padgett			
<p>Conditional Neural Network-Based Parameter Estimation for Non-Gaussian Wind</p> <p><i>Haifeng Wang*, Paolo Bocchini, Jamie Padgett</i></p>	<p>Neural-Network Based Wind Pressure Prediction for Low-Rise Buildings with Genetic Algorithm and Bayesian Optimization</p> <p><i>Zhixia Ding*, Wei Zhang, Dongping Zhu</i></p>	<p>Effect of Foundation Flexibility on the Interaction Between Elevated Light-Framed Timber Coastal Housing and Solitary Waves</p> <p><i>Vasileios Kotzamanis*, Dimitrios Kalliontzis</i></p>	<p>A Study on the Hydrodynamic Response of Hypar Thin Shell Against Waves via a Decoupled SPH-FEM Analysis and Goda's Formula</p> <p><i>Gaoyuan Wu*, Maria Garlock, Shengzhe Wang</i></p>	<p>Urban Planning and Coastal Hazards: A Future Oriented Agent-Based Model for Coastal Community Resilience</p> <p><i>Dylan Sanderson*, Dan Cox, Mehrshad Amini, Andre Barbosa</i></p>	

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Hodson 216	#M607	Developments in Performance-Based Structural Fire Engineering, Chair(s): Thomas Gernay			
<p>Damage Assessment of Reinforced Concrete Tunnel Linings</p> <p><i>Nan Hua, Anthony Tessari, Negar Elhami-Khorasani*</i></p>	<p>Damage Assessment Methods for Rapid Post-Fire Tunnel Inspection</p> <p><i>Thomas Vitalis*, James Viglas, Simos Gerasimidis, Scott Civjan, Nicholas Menz, John Czach, Joseph Rigney</i></p>	<p>The Effects of Heating Duration on Post-Fire Structural Steel Mechanical Properties</p> <p><i>James Gordon, Erica Fischer*</i></p>	<p>Performance-Based Optimization of Structural Fire Mitigation Strategies for Roadway Tunnels</p> <p><i>Zheda Zhu*, Aerik Carlton, Spencer Quiel, Clay Naito</i></p>	<p>Ductile Fracture of Advanced High Strength Steels at Elevated Temperatures</p> <p><i>Chenzhi Ma*, Thomas Gernay</i></p>	
Krieger 300	#M608	Civil Infrastructure in a Changing Climate: from Nonstationary Risk Assessment to Developing Adaptation Strategies, Chair(s): Eun Jeong Cha			
<p>Optimization of Coastal Protection Amidst Sea Level Rise, Given Limited Resources: Case Studies in NYC</p> <p><i>Yuki Miura*, George Deodatis, Kyle Mandli</i></p>	<p>Time-Dependent Formulation for Storm Surge Predictions</p> <p><i>Aditya Pandey*, Alessandro Contento, Paolo Gardoni</i></p>	<p>Hurricane Wind and Freshwater Flood Risk Assessment Considering Climate Change</p> <p><i>Chi-Ying Lin, Eun Jeong Cha*</i></p>	<p>Quantifying the Long-Term Effects of Climate Change on Sea Conditions and Fatigue Deterioration in Ship Hulls Across the Atlantic Ocean</p> <p><i>Mohamed Soliman*, Mohammad Tamimi, Omid Khandel</i></p>	<p>Resilience Enhancement of Power Distribution Systems in a Changing Climate: Investment Planning via Multi-Stage Stochastic Optimization</p> <p><i>Nariman Dehghani, Abdollah Shafieezadeh, Ashkan B. Jeddi*</i></p>	<p>Bio-Inspired Adaptive Building Envelope for Energy Efficiency</p> <p><i>Xiong Yu*, Jianying Hu</i></p>
Shaffer 304	#M609	Analysis and Prediction of Wind Effects on the Built Environment, Chair(s): Catherine Gorle			
<p>Understanding the Physics Behind Peak Pressure Events</p> <p><i>Mattia Fabrizio Ciarlatani*, Zhu Huang, David Philips, Catherine Gorlé</i></p>	<p>Large-Eddy Simulation of Wind Loads on a Tall Building Located in a City Center: Validation with Experimental Data</p> <p><i>Abiy Melaku, Jeroen Janssen, Peter McDonald, Nickolaus Sundholm, Girma Bitsuamlak*</i></p>	<p>Impact of Inflow Turbulence on Validation of Large-Eddy Simulations of Wind-Induced Pressures on Buildings</p> <p><i>Lup Wai Chew, Catherine Gorlé*</i></p>	<p>Real-Time Hybrid Simulation of Wind-Induced Aerodynamic Vibrations on a Tall Building</p> <p><i>Liang Cao*, Haitham Ibrahima, Thomas Marullo, James Erwin, James Ricles, Amal Elawady, Arindam Chowdhury</i></p>	<p>Extrapolation of Wind Pressure Coefficients for Low-Rise Buildings at Different Scales Using Meta-Learning</p> <p><i>Yanmo Weng*, Stephanie Paal</i></p>	

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Shaffer 2	#M614	Modeling Deterioration of Structures and Infrastructure, Chair(s): Gaofeng Jia			
Stochastic Differential Equations for the Modeling of the Deterioration of Engineering Systems <i>Leandro Iannacone*, Paolo Gardoni</i>	Long-Term Performance of Aged RC Structures via Life-Time History Analysis <i>Codi McKee*, Petros Sideris, Mija Hubler</i>	Remaining Capacity of Corroded Steel Beam Ends in New England <i>Aidan Provost*, Dr. Georgios Tzortzinis, Dr. Simos Gerasimidis, Dr. Sergio Breña</i>	Development of a Physics-Based Model to Simulate an Extra-Terrestrial Habitat with Damageable and Repairable Capabilities <i>Adnan Shahriar, Sterling Reynolds, Arsalan Majlesi, Arturo Montoya*</i>	Assessing the Vulnerability of Long-Term Deep-Space Habitats Subjected to Micrometeoroid Impact <i>Seyed Arsalan Majlesi*, Amir Behjat, Adnan Shahriar, Arturo Montoya</i>	
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Jian Li / Vedhus Hoskere			
Keynote presentation: A Literature Review on Deep Learning-Based Pavement Crack Segmentation <i>Shanglian Zhou, Carlos Canchila*, Wei Song</i>		Super-Resolution Models for Visual Structural Inspections <i>Kareem Eltouny, Seyedomid Sajedi, Xiao Liang*</i>	Inexpensive and Scalable Detection of Corrosion Using Semi-Supervised Deep Learning and Minimal Labeled Data <i>Mohamad Alipour*, Devin Harris</i>	Optimized DCNN for Crack Segmentation Using Bayesian Optimization <i>Carlos Canchila*, Shanglian Zhou, Wei Song</i>	Fusing Infrared and Visible Images of Different Resolutions via Convolutional Neural Network <i>Zahra Ameli*, Eric Landis</i>
Krieger 308	#M712	Data-Driven Approaches to Engineering Mechanics, Chair(s): Fatemeh Pourahmadian			
Manifold Embedding Data-Driven Elasticity <i>Bahador Bahmani, WaiChing Sun*</i>	Linking Material Properties to Microstructure In Liquid Metal Elastomer Composites via Machine Learning <i>Abhijith Thoopul Anantharanga, Mohammad Saber Hashemi, Azadeh Sheidaei*</i>	Physics-Informed Neural Networks for Ultrasonic Elastography <i>Yang Xu*, Fatemeh Pourahmadian</i>	Evaluation of Knowledge Transfer Models for Estimating the Lateral Strength of Reinforced Concrete Columns <i>Hongrak Pak*, Stephanie Paal</i>	Machine Learning Models for Prediction of Single and Multiple Concrete Properties with SHAP Method Interpretation. <i>Rodrigo Teixeira Schossler*, Xiong (Bill) Yu</i>	

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10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Krieger 306	#M801	Geomechanics of Geological Carbon Storage and Enhanced Hydrocarbon Recovery, Chair(s): Amin Mehrabian / Yanhui Han			
Nanoconfinement Matters in Humidified CO ₂ Interaction with Calcium and Magnesium Silicates	A Novel Multiphysics Multiscale Multiporosity Shale Gas Transport Model for Geomechanics/Flow Coupling in Steady and Transient States	Full Coupling of CO ₂ -CH ₄ Diffusion and Sorption with Solid Deformation in Gas Shale Enhances Natural Gas Recovery and Geological CO ₂ Storage Capacity	Evaluating Stimulation Efficiency of Chemically Treated Microproppant Pack in Microfractures Using LBM-DEM Coupling Approach	Research on Multi-Gas Three-Dimensional Development and Carbon Storage Technology of Deep Coal-Bearing Rock System	Experimental Investigation of Non-Monotonic Fracture Conductivity Evolution in Energy Georeservoirs
<i>Mohammad Javad Abdolhosseini Qomi, Siavash Zare, Ali Morshedifard*</i>	<i>Zihao Li, Yuntian Teng, Ming Fan, Nino Ripepi, Cheng Chen*</i>	<i>Wei Zhang, Amin Mehrabian*</i>	<i>Yanhui Han*, Feng Liang</i>	<i>Bing Hou*</i>	<i>Zihao Li, Qingqi Zhao, Yuntian Teng*, Ming Fan, Nino Ripepi, Xiaolong Yin, Cheng Chen*</i>

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 210	#M101	The Next Frontiers in Natural Hazards Engineering: Advancing the Vision of Ahsan Kareem, Chair(s): Tracy Kijewski-Correa		
From Full-Scale Monitoring to Digital Twins and Beyond: Scholarship Development Inspired by Dr. Kareem's Vision <i>Yanlin Guo, Yue Dong*</i>	Predicting Dynamic Response of Slender Structures in Windstorms <i>Partha Sarkar*</i>	Inelastic Response of Wind-Excited Tall Buildings: Reduced-Order Modeling and Biaxial Load Effect <i>Jinghui Huang, Xinzhong Chen*</i>	Past, Present and Future of Performance-Based Wind Engineering <i>Seymour Spence*</i>	A Common Framework to Represent, Analyze and Share Wind Pressure Data <i>Luigi Carassale*</i>
Hodson 211	#M201	Multiscale Behavior of Damage and Failure Mechanics, Chair(s): Chandra Prakash		
Concurrent Multiscale Modeling of Damage Evolution in 2D Materials <i>James Lee*, Jiaoyan Li</i>	Fracture of 2D Materials – In situ Experiments and ML Parameterized Force Fields <i>Horacio D. Espinosa*, Xu Zhang, Hoang Nguyen</i>	Multi-Scale Crystal Plasticity Approach to Simulate Creep in Superalloys <i>Shahriyar Keshavarz*, Carelyn Campbell, Andrew Reid</i>	Data-Driven Parametrically-Upscaled Continuum Damage Mechanics (PUCDM) Model for Composites <i>Xiaofan Zhang*, Somnath Ghosh</i>	Experimental Evaluation of Damage Growth and its Relationship with Stress State for Ductile Fracture in Stainless Steel <i>Surajit Dey*, Ravi Yellavajjala</i>
Hodson 301	#M202	Cementitious Materials: Experiments and Modeling Across the Scales, Chair(s): Christian Hellmich		
Bounds of Relaxation Functions for Aging Composites <i>Kairat Tuleubekov*, Lev Khazanovich</i>	Carbon Nanofibers (CNFs) Dispersed in Ultra-High Performance Concrete (UHPC): Mechanical Property, Workability and Permeability Investigation <i>Linfei Li*, Boning Wang, Mija Hubler</i>	Compressive Behavior and Constitutive Modeling of Nano-Enhanced UHPC <i>Milana Cimesa*, Mohamed Moustafa</i>	Hydration-Induced Densification of C-S-H Gel Studied Based on NMR Data: Investigation of Different Curing Temperatures <i>Nabor Jiménez Segura*, Christian Hellmich, Bernhard L.A. Pichler</i>	

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 213	#M203	Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering, Chair(s): Kirubel Teferra		
End-to-End Deep Learning Method to Predict Stress Tensor Field for Composites with Application in Multiscale	Predicting the Yield Behavior of Polycrystalline Aggregates Using a Generalized Schmid Factor Approach	Uncertainty-Quantified Parametrically-Upscaled Continuum Damage Mechanics (UQ-PUCDM) Model for Plain Weave Woven Composites	Stochastic Modeling and Experimental Identification of Anisotropic Elasticity-plasticity Constitutive Laws for Additively Manufactured Materials	
<i>Ashwini Gupta*, Anindya Bhaduri, Lori Graham-Brady</i>	<i>Coleman Alleman*</i>	<i>Yanrong Xiao*, Somnath Ghosh</i>	<i>Shanshan Chu, Johann Guilleminot*, Athanasios Illiopoulos, John Michopoulos</i>	
Krieger 170	#M208	Mechanics and Physics of Granular Materials, Chair(s): Anthony Rosato		
Particle Mechanics Approach to Modeling Impact Response and Wave Propagation in Bonded Particulate Systems	Quantification of Breakage During the Compaction of Granular Materials Across Strain Rates	Tracking Sequential Particle Shape Evolution in Crushable Sand via X-Ray Tomography	Mechanics of Coarse-Grained Soils Subjected to Thermal Cycling	Mechanics of Ant Tunnels
<i>Marcial Gonzalez*</i>	<i>Brett Kuwik*, Max Garcia, Ryan Hurley</i>	<i>Dawa Seo*, Giuseppe Buscarera</i>	<i>Alessandro F. Rotta Loria*, Jibril B. Coulibaly, Yize Pan</i>	<i>Robert Buarque de Macedo*, Edward Ando, Shilpa Joy, Gioacchino Viggiani, Raj Kumar Pal, Joseph Parker, Jose Andrade</i>
Krieger 180	#M210	Reduced-Order and Surrogate Models for Mechanics of Porous Media, Chair(s): Dakshina M. Valiveti		
Physics Guided Deep Learning Manifold Linearization of Porous Media Flow Equations	A Multilevel Sampling Approach for Uncertainty Quantification of Large-Scale Subsurface Flow	Applying Reduced-Physics Modeling to Accelerate Depletion Planning Optimization Under Subsurface Uncertainty	On the Modeling of Porous Structures via Variable-Order Calculus	
<i>Marcelo Dall'Aqua, Emilio Coutinho, Eduardo Gildin*</i>	<i>Hillary Fairbanks*, Umberto Villa, Panayot Vassilevski</i>	<i>Shua He, Santosh Verma, Alireza Sanaei*</i>	<i>Sansit Patnaik*, Mehdi Jokar, Fabio Semperlotti</i>	

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 313	#M211	Challenges and Advances in Material Damage Modeling, Chair(s): Mostafa Mobasher		
A Fourth-Order Phase-Field Fracture Model: Formulation and Numerical Solution Using a Continuous/Discontinuous Galerkin Method <i>Lampros Svolos*, Hashem Mourad, Gianmarco Manzini, Krishna Garikipati</i>	Efficient Phase Field Fracture Calculations: Domain-Decomposition Solvers and Adaptive Re-Meshing <i>Haim Waisman*</i>	Integrating PINNs with FEM to Model Non-Local Continuum Damage <i>Panos Pantidis*, Mostafa Mobasher</i>	Modeling Fracture in Rate-Dependent Polymer Networks: A Quasicontinuum Approach <i>Ahmed Elbanna*, Ahmed Ghareeb</i>	Homogenization of Coupled Discrete Models for Mass Transport and Fracture in Concrete <i>Gianluca Cusatis*, Jan Elias</i>
Latrobe 120	#M213	Advances in Experimental, Theoretical, and Computational Fracture Mechanics, Chair(s): Ange-Therese Akono / Arturo Montoya		
Innovative Method for Progressive Crack Growth Analysis <i>Eric Cheifet*, Joseph Cluever, Evan Schickel, Robert Vecchio</i>	A Comprehensive Experimental Program of Concrete Notched Beams Using Digital Image Analysis to Identify Concrete Fracture Parameters <i>Mohammad Minhajur Rahman*, Zahra Ameli, Christian Carloni</i>	A Multiphysical Surface-Force Based Fracture Theory for Subcritical Crack Growth in Surface-Reactive Environments <i>Mehdi Eskandari Ghadi, Yida Zhang*</i>	Determination of the Cohesive Fracture Energy of Biofilms Using Scratch Tests <i>Haklae Lee*, Ange-Therese Akono</i>	
Hodson 316	#M219	Mechanics of Wood and Wood Based Materials, Chair(s): Fiona O'Donnell		
Application of Variability Response Functions for Cross Laminated Timber Panels with Nonlinear Constitutive Laws <i>Fiona O'Donnell*, Sanjay Arwade</i>	Glulam Beams with Finger-Joints – Numerical and Analytical Model <i>Barbara Fortuna*, Goran Turk, Simon Schnabl</i>	Modeling Concept for the Estimation of Bending Strength and Height Effect of Glued Laminated Timber Beams <i>Markus Lukacevic*, Christoffer Vida, Josef Füssl</i>	Computational Modeling of Time-Dependent Behavior of Laminated Timber <i>Susan Alexis Brown, Danyang Tong*, David Corr, Gianluca Cusatis</i>	

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Krieger 304	#M222	6th Mini-Symposium on 4M (Modeling of Multiphysics-Multiscale-Multifunctional) Engineering Materials and Structures, Chair(s): Qiming Wang		
An Equivalent D50 to Predict the Erodibility of Cohesive Riverbed Soils in Nebraska <i>Basil Abualshar*, Chung Song</i>	Mechanics of Bioinspired Living Materials <i>Qiming Wang*</i>	Multifunctional Zirconia-Reinforced Metal-Matrix Composite for Energy Dissipation and High Temperature Applications <i>Marwa Yacouti*, Maryam Shakiba</i>	Tensile Deformation in Polyurea: An All Atom Molecular Dynamics Study <i>Arunjyoti Sinha Roy, Nilanjan Mitra* Somnath Ghosh</i>	
Hodson 303	#M229	Additive Manufacturing: Novel Processing, Design, Materials, Structures and Functions, Chair(s): Jochen Mueller		
A Study of the Effects of Oxide Films on the Cold Spray Behavior of Aluminum and Titanium Alloy Powders <i>Mobin Vandadi, Arvand Navabi, Trevor Bond, Ridwan Ahmed, John Obayemi, Joseph Oghenevweta, Nima Rahbar*, Winston Soboyejo</i>	Overcoming Mutual Exclusivities in the Mechanical Properties of Cellular Solids via Direct-Ink Writing <i>Jochen Mueller*</i>	Computational Design of Additively Manufactured Composite TPU Materials <i>Seda Oturak*, Callie Zawaski, Melinda McKeehan, Wesley Reinhart</i>	Multiphysics Modeling of Frontal Polymerization based Layer-by-Layer 3D Printing of Thermoset Polymer Components <i>Zhuoting Chen*, Morteza Ziaee, Mostafa Yourdkhani, Xiang Zhang</i>	
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Hamed Ebrahimi		
Exploratory Study of System Identification and Seismic Response Monitoring of Pipeline Systems Using Drone Videos <i>Mohamed Moustafa*, Luna Ngeljaratan</i>	Rail Defect Detection by Noncontact Vibration Measurements <i>Korkut Kaynardag*, Chi Yang, Salvatore Salamone</i>	A Fault Detection and Diagnosis Algorithm for Extraterrestrial Habitats and its Experimental Validation <i>Zixin Wang*, Yuguang Fu, Adnan Shahriar, Benjamin Wogen, Mohammad Jahanshahi, Amin Maghareh, Arturo Montoya, Shirley Dyke</i>	Linear System Identification of the UC San Diego Geisel Library Building <i>Lin Sun*, Joel Conte, Michael Todd, Jose Restrepo, Yehuda Bock</i>	

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Shaffer 100	#M306	Practical Applications and Value of Advanced Computational and Probabilistic Modelling in the Life-Cycle of Structures, Chair(s): Paolo Bocchini		
Computational and Experimental Insights into Life-Cycle Structural Reliability Assessment of Concrete Bridges Under Corrosion <i>Mattia Anghileri*, Luca Capacci, Fabio Biondini</i>	Probabilistic Investigation on the Behavior and Reliability of Steel Connections Combining Slip-Critical Bolts and Fillet Welds <i>Mohammad Tamimi*, Omid Khandel, Mohamed Soliman</i>	Structural Evaluation of Ledges in Shiplap Hinge Joints Using Empirical and Strut-and-Tie Methods <i>Shaymaa Obayes*, Monique Head, Daniel Baxter</i>	Improving the Computational Efficiency of Life-Cycle Building-Performance Estimation Through Reduced Order Modeling and Multi-Fidelity Monte Carlo Techniques <i>Dimitrios Patsialis*, Alexandros Taflanidis, Dimitrios Vamvatsikos</i>	Multi Hazard Assessment of Aging River-Crossing Reinforced Concrete Bridges <i>Reza Filizadeh*, Eric Hernandez, David Rosowsky</i>
Hodson 305	#M308	Origami/Kirigami Inspired Structures and Metamaterials, Chair(s): John Brigham		
Dynamic Homogenization of Periodic Origami Inspired Structures <i>Othman Oudghiri-Idrissi*, Bojan Guzina</i>	Modular Architecture for Origami-Inspired Flat-Folding Robots <i>Alexandra Haraszti*, Manan Arya, Sarah Hovsepian</i>	Harnessing Pre-Stress for Continuous Equilibrium Under Gravity <i>Maria Redoutey, Evgueni Filipov*</i>	Frustrated Metamaterials as Pop-Up Domes <i>Paolo Celli*, Olivine Silier, Lucas Annink, Chiara Daraio</i>	
Latrobe 107	#M313	Analysis of Heritage Structures: Tools and Methods for Assessing Unknowns in Historic Monuments and Structures, Chair(s): Rebecca Napolitano		
Impulse Response Testing for Evaluation of Heritage Structures <i>Linda Seymour*</i>	A Methodology to Support the Adaptive Reuse of a Historical Dwelling: the Case Study of a 'Sobrado' House-Type <i>Daniele Melo Santos Paulino*, Ella Hill, Heather Ligler, Rebecca Napolitano</i>	Three-Dimensional Visualization of Nondestructive Evaluation Results <i>Torin McCue*, Carlo Citto</i>	Load Sharing In Accidental Hybrid Structures <i>Donald Friedman*</i>	

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): Alireza Asadpoure		
<p>A Frame-Element Based Topology Optimization Framework for Low-Density Designs</p> <p><i>Josephine Carstensen*</i></p>	<p>Topology Optimization of Dynamic Structures Using a State Space Representation</p> <p><i>Andrew H. Fletcher*, Philip M. Renkert, Andrew G. Alleyne, Kai A. James</i></p>	<p>Seismic Topology Optimization of Tall Buildings Using Modal Decomposition</p> <p><i>Amory Martin*, Gregory Deierlein</i></p>	<p>Local Stress Constraints in Topology Optimization of Structures Subjected to Arbitrary Dynamic Loads: a Stress Aggregation-Free Approach</p> <p><i>Oliver Giraldo-Londoño*, Miguel A. Aguilo, Glaucio H. Paulino</i></p>	<p>Reliability-Based Topology Optimization via an Inverse Tangent Constraint Approximation</p> <p><i>Alberto Torres*, James Warner, Miguel Aguilo, James Guest</i></p>
Hodson 315	#M403	20th Symposium on Biological and Biologically Inspired Materials and Structures, Chair(s): Christian Hellmich		
<p>Patient Specific Finite Element Analysis of the Influence of Intraocular Pressure on the Optic Nerve Head</p> <p><i>Soumaya Ouhsousou*, Amin Pourasghar, Lucy Q. Shen, Chhavi Saini, Mengyu Wang, John C. Brigham</i></p>	<p>Material Models for Fibrous Elastomeric Biological and Bio-Inspired Materials</p> <p><i>Shruti Motiwale*, Christian Goodbrake, Wenbo Zhang, Michael Sacks</i></p>	<p>Nature Inspired Microvascular Active Cooling Network Design Using Steady State and Transient Topology Optimization</p> <p><i>Jonathan Gorman*, Reza Pejman, Ahmad Najafi</i></p>	<p>Why Gannets Survive Repeated Plunges at High Velocity</p> <p><i>Bart Boom*, Anthony Nguyen, Andrew Duim, Aidan Sleavin, Simon Shimel, Frank E. Fish, Tadd Truscott, Ed Habtour</i></p>	<p>Biocompatibility of Geopolymer Scaffolds for Bone Tissue Regenerative Engineering</p> <p><i>Ange-Therese Akono*, Xinlong Wang, Chongwen Duan, Guillermo Ameer</i></p>
Shaffer 300	#M407	Advances in Computational Methods for Uncertainty Quantification and Robust/Performance-Based Design of Structures and Systems Exposed to Natural and Man-Made Hazards, Chair(s): Aikaterini Kyprioti		
<p>Extended Polynomial Chaos Expansion-Based Framework for Sensitivity and Reliability Analysis Under Uncertainty and Modeling Errors</p> <p><i>Zhiheng Wang*, Roger Ghanem</i></p>	<p>Application of Probabilistic Learning on Manifolds (PLoM) for Performance-Based Seismic Assessment of Reinforced Concrete Moment Frame</p> <p><i>Kuanshi Zhong*, Javier Navarro, Sanjay Govindjee, Gregory Deierlein</i></p>	<p>Multi-Criteria Optimal Design of Uncertain Building Systems Subject to Stochastic Wind Loads</p> <p><i>Thays Duarte, Arthriya Subgranon*</i></p>	<p>Efficient Global Sensitivity Analysis for High-Dimensional Outputs Combining Data-Driven Probability Models and Dimensionality Reduction Techniques</p> <p><i>Woonghee Jung*, Alexandros Taflanidis</i></p>	<p>Markov-Transformable Processes to Model Deteriorating Engineering Systems</p> <p><i>Leandro Iannacone*, Armin Tabandeh, Paolo Gardoni</i></p>

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Krieger 302	#M606	Resilience of Coastal Structures, Systems, and Community Subjected to Hazards, Chair(s): Wei Zhang		
Quantitative Multi-Hazard Community-Level Hurricane Risk Assessment Approach <i>Omar Nofal, John van de Lindt*</i>	Life Safety Risk for Coastal Communities Affected by Nearfield Earthquake and Tsunami <i>Mehrshad Amini*, Daniel Cox, Andre Barbosa, Dylan Sanderson</i>	Prediction of Waterborne Large Woody Debris Accumulations and Scour for Bridges in Flooding Events <i>William Hughes*, Wei Zhang</i>	Simulation-Based and Risk-Informed Assessment of the Effectiveness of Tsunami Evacuation Routes Using Agent-Based Modeling <i>Zhenqiang Wang*, Gaofeng Jia</i>	Prediction of Communities' Flood Resilience in a Changing Climate: A Multi-Stage Framework Using Machine Learning Techniques <i>Moustafa Naiem Abdel-Mooty*, Wael El-Dakhkhni, Paulin Coulibaly</i>
Hodson 216	#M607	Developments in Performance-Based Structural Fire Engineering, Chair(s): Negar Elhami Khorasani		
Keynote presentation: Performance Evaluation of a Coupled Fire-Atmosphere Wildfire Simulation Platform: The 2018 Camp Fire Case Study <i>Kasra Shamsaei, Timothy W. Juliano, Matthew Roberts, Hamed Ebrahimian*, Branko Kosovic, Neil P. Lareau, Ertugrul Taciroglu</i>		Residual Strength Assessment of a Heat-Straightened Steel I-Section Member Exposed to a Fire Event: A Case Study of a Brent Spence Bridge Stringer <i>Hizb Ullah Sajid*, Ryan Slein</i>	Post-Fire Stability and Performance of Tall Steel Buildings <i>Serdar Selamet*, Aykut Onursal, Yusuf Özer</i>	Fire Spread in Buildings Considering Seismic Damage to Active and Passive Fire Protection Systems <i>Maxwell Coar*, Maria Garlock</i>
Shaffer 304	#M609	Analysis and Prediction of Wind Effects on the Built Environment, Chair(s): Marco Giometto		
Initial Considerations for the Development of a National Full-Scale Testing Infrastructure for Community Hardening in Extreme Wind, Surge, and Wave Events (NICHE) <i>Forrest Masters*, Arindam Chowdhury, Amal Elawady, Hermann Fritz, Catherine Gorle, Tracy Kijewski-Correa, Frank Lombardo, Pedro Lomonaco, Kristin Taylor, John van de Lindt, Paul Vasilescu, Ioannis Zisis</i>	Large-Scale Turbulence Modulation in the Wind Tunnel Using a Multi-Fan Flow Control Instrument <i>Pedro L. Fernández-Cabán*, Ryan A. Catarelli</i>	Advancements in the Physical Simulation of Non-Synoptic Extreme Wind Events in a Large Boundary Layer Wind Tunnel <i>Ryan Catarelli*, Forrest Masters, Brian Phillips, Jennifer Bridge, Kurtis Gurley, Tai-An Chen</i>	Equivalent Turbulence Profiles from Randomized Terrain in a Boundary Layer Wind Tunnel <i>Mariel Ojeda-Tuz*, Mohit Chauhan, Ryan Catarelli, Michael Shields, Kurtis Gurley</i>	An Investigation on the Effects of Translating Tornadoes on Wind Loading Using a Potential Flow Model <i>Shuan Huo*, Jin Wang, Fred Haan, Gregory Kopp, Mark Sterling</i>

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Shaffer 202	#M613	Recent Advances in Response Modification Devices and Strategies, Chair(s): Konstantinos Kalfas		
Experimental Studies on the Design Parameters of Pressurized Sand Dampers <i>Konstantinos Kalfas*, Nicos Makris</i>	Adaptive Shape Memory Alloy Cable-Based Isolation Systems <i>Sasa Cao, Osman Ozbulut*, Fei Shi, Jiangdong Deng</i>	Characterization of Energy Dissipation During Cyclic Loading of a Sand Damper <i>Usama El Shamy*, Ehab Sabi, Kostas Kalfas, Nicos Makris</i>	Impact of Spine Strength and Stiffness on the Seismic Response of Strongback Frames <i>Peter Talley*, Mark Denavit, Nicholas Wierschem</i>	
Shaffer 2	#M614	Modeling Deterioration of Structures and Infrastructure, Chair(s): Gaofeng Jia		
Corrosion Cracking Behavior of Reinforced Concrete Under Freeze-Thaw Cycles <i>Xiguang Liu, Ziwei Yan*, Ditao Niu</i>	Evolution of Bending Failure Mode and Bearing Capacity of RC Beams with Corrosion Propagation of Steel Reinforcements <i>Chao Jiang, Hao Ding*, Xiang-Lin Gu, Wei-Ping Zhang</i>			
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Wei Song / Jian Li		
Keynote presentation: Physics-Based Graphics Models as Visual Inspection Testbeds <i>Vedhus Hoskere*, Yasutaka Narazaki, Billie F. Spencer Jr.</i>		Artificial Intelligence Based Digital Twinning Framework for Structural Cyber Physical Systems <i>Mehrdad Shafiei Dizaji*, Zahra Zhiyanpour, Aya Yehia, Devin Harris</i>	Autonomous Classification of Road Roughness Using Deep Convolutional Neural Network Considering Environmental Conditions <i>YoungJae Lee*, Robin Eunju Kim</i>	Unsupervised Image to Image Translation of Structural Damage <i>Subin Varghese*, Vedhus Hoskere</i>

TS 2: WEDNESDAY AFTERNOON, JUNE 1

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Krieger 300	#M702	Uncertainty Quantification-Aided Machine Learning in Engineering for Hazards, Chair(s): Som Dhulipala / Michael Shields / Henry Burton		
Adaptive Sequential Sampling for Polynomial Chaos Expansions of Vector-Valued Response Quantities <i>Lukáš Novák, Miroslav Vorechovský*</i>	Deep Neural Network-Based Regional Seismic Loss Assessment Considering Correlation Between EDP Residuals of Building Structures <i>Chulyoung Kang*, Taeyong Kim, Oh-Sung Kwon, Junho Song</i>	Multifidelity Active Learning for the Failure Analysis of a Nuclear Fuel <i>Som Dhulipala*, Wen Jiang, Benjamin Spencer, Jason Hales, Michael Shields</i>	Localized Approximations by Polynomial Chaos Expansions for Highly Non-Linear Functions <i>Lukáš Novák*, Miroslav Vorechovský</i>	Physically-Informed Deep Learning of High-Dimensional Nonlinear Dynamic Systems Subject to General Stochastic Wind Excitation <i>Bowei Li*, Seymour Spence</i>
Krieger 308	#M712	Data-Driven Approaches to Engineering Mechanics, Chair(s): Fatemeh		
Discovering Dynamical Equations Using a Denoised State-Variable Transformation <i>Jacqueline Wentz*, Alireza Doostan</i>	Convolutional Autoencoders for Compressing and Decoding Metal Microstructures <i>Dharanidharan Arumugam, Ravi Yellavajjala*</i>	Time-Domain Linear Sampling Method for In-Situ Ultrasonic Imaging <i>Jian Song*, Xiaoli Liu, Fatemeh Pourahmadian, Housseem Haddar</i>	Neural Networks-Based Elementwise Classification to Detect Multiple Voids in a Solid Using Elastic Waves <i>Fazle Mahdi Pranto*, Shashwat Maharjan, Bruno Guidio, Stephen Lloyd, Chanseok Jeong</i>	

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 210	#M101	The Next Frontiers in Natural Hazards Engineering: Advancing the Vision of Ahsan Kareem, Chair(s): Tracy Kijewski-Correa		
Variational Multiscale Immersed Boundary Method for Incompressible Turbulent Flows <i>Arif Masud*, Soonpil Kang</i>	Effects of Different Shape Parameters on the Wind Pressure Peak Factors for Hyperbolic Paraboloid Roofs <i>Michele Barbato*, Fabio Rizzo</i>	Evolution of Bridge Aeroelasticity and Wind-Resistant Design of Long-Span Bridges: The Contributions of Ahsan Kareem <i>Miguel Cid Montoya*</i>	Addressing Spatio-Temporal Features in Storm Surge Surrogate Modeling Through Separable Gaussian Process Implementation <i>Aikateritni Kyrioti, Alexandros Taflanidis*, Christopher Irwin, Norberto Nadal-Caraballo</i>	Wind: A Force for Good <i>Lance Manuel*, Paul Veers</i>
Hodson 211	#M201	Multiscale Behavior of Damage and Failure Mechanics, Chair(s): Yaneng Zhou		
A Concurrent Model Framework for Self-Consistent Homogenization Based Parametrically Upscaled Continuum Damage Mechanics (PUCDM) Model for High Strain-Rate Response of Composites <i>Chandra Prakash*, Somnath Ghosh</i>	Experimental Analysis of Desiccation Cracking Phenomenon of Clays Related to the Initial Imposed Suction Using DIC Method <i>Lamine Ighil Ameer*, Mahdia Hattab</i>	Analytical Stress Intensity Factor for Shear In-Plane Load in Reflective Cracking Model <i>Kairat Tuleubekov*, David Brill</i>	Crack Cooling During Dynamic Crack Propagation in Thermo-Visco-Elastic-Plastic Solids <i>Jacob Thiesen*, Jiaoyan Li</i>	
Hodson 301	#M202	Cementitious Materials: Experiments and Modeling Across the Scales, Chair(s): Franz-Josef Ulm		
Comparison of Graded and Thin-Shell Models for the Interfacial Transition Zone <i>Robert Zimmerman*</i>	Effect of Time-Dependent Bond Slip on Delayed Failure of Reinforced Concrete Frames <i>Roberto Ballarini*, Jialiang Le, Livia Mello</i>	Micromechanical Effects of Notch Size in Concrete Under Fatigue Loading <i>Keerthana Kirupakaran*, Chandra Kishen J. M.</i>	Effect of Thermal Cycles and Fatigue Loading on Concrete Incorporating Plastic Particles <i>Madiha Ammari*</i>	Numerical Analysis of Post-Tensioned Engineered Cementitious Composite Members with Unbonded Tendons <i>Mi Jin Jung*, Pinar Okumus</i>

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 213	#M204	Architected Materials, Chair(s): Stavros Gaitanaros		
<p>Incorporating Architected Materials in Multiscale Structural Optimization with Deep Learning</p> <p><i>Nolan Black*, Ahmad R. Najafi</i></p>	<p>3D Printed Tubular Lattice Metamaterials with Enhanced Mechanical Properties</p> <p><i>Huan Jiang*, Hannah Ziegler, Zhennan Zhang, Sundar Atre, Yanyu Chen</i></p>	<p>A Reduction-Based Method for Modelling Lattice Materials</p> <p><i>Yash Agrawal*, G. K. Ananthasuresh, James K. Guest</i></p>	<p>On the Compressive Strength of Brittle Cellular Materials</p> <p><i>Enze Chen*, Shengzhi Luan, Stavros Gaitanaros</i></p>	<p>Advanced In-Situ Fabrication of Nanofibers via a Modified Wet Electrospinning Method to Yield Advanced Polymer-Ceramic Nanocomposites</p> <p><i>Yunzhi Xu*, Ping Guo, Ange-Therese Akono</i></p>
Hodson 303	#M207	Dispersive Waves and Shock in Solid Domains with Micro-Structure, Chair(s): Alireza Amirkhizi		
<p>Reduced Order Modeling of Mechanical Metamaterials Under Dynamic Loading</p> <p><i>Weidi Wang, Willoughby Cheney, Reza Abedi, Alireza V. Amirkhizi*</i></p>	<p>Analytical Modeling and Laboratory Characterization of Elastic Moduli Dispersion and Poromechanical Responses of Dual-Porosity Dual-Permeability Porous Materials</p> <p><i>Chao Liu*, Dung Phan</i></p>	<p>Lab-Scale Characterization of Micro-Structured Mechanical Metamaterials via Phase Separation of Overlapped Waves</p> <p><i>Joshua Morris, Darshil Shah, Thomas A. Plaisted, Christopher Hansen, Alireza V. Amirkhizi*</i></p>	<p>Comparing Mechanical Response of Porcine Skin for Penetrating and Non-Penetrating Ballistic Impacts</p> <p><i>Joseph LeSueur*, Carolyn Hampton, Jared Koser, Sajal Chirvi, Frank A Pintar</i></p>	
Hodson 216	#M214	Integrated Computational Materials Engineering (ICME) Mini-Symposium, Chair(s): George Z Voyiadjis		
<p>PRISMS-Plasticity and PRISMS-Fatigue: ICME Frameworks to Advance Boundaries of High-Fidelity Simulations</p> <p><i>Mohammadreza Yaghoobi*, Krzysztof S. Stopka, Aaditya Lakshmanan, Duncan Greeley, Zhe Chen, John E. Allison, David L. McDowell, Veera Sundararaghavan</i></p>	<p>Modeling Microscale Solidification and Residual Stresses of As-Built Additively Manufactured Materials</p> <p><i>Lukasz Kuna, Kirubel Teferra*</i></p>	<p>A Microstructure-Based Porous Crystal Plasticity Finite Element Model for Additively Manufactured Ti-6Al-4V Alloys</p> <p><i>Maxwell Pinz*, Somnath Ghosh</i></p>	<p>A Dislocation-Based Crystal Plasticity Finite Element Simulation for the Micropillar Compression</p> <p><i>Juyoung Jeong, George Voyiadjis*</i></p>	<p>Evaluation and Construction of Microstructural Data Distributions for ICME Applications.</p> <p><i>Noah Wade*, Lori Graham-Brady</i></p>

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 305	#M308	Origami/Kirigami Inspired Structures and Metamaterials, Chair(s): Mark Schenk		
Simulation of Thermo-Mechanical Coupling in Origami Assemblages <i>Yi Zhu*, Evgueni Filipov</i>	Evaluation of Kirigami Façade Concepts Towards Optimal Design for Irradiance and Air Flow <i>Rodrigo Arauz*, Aminallah Pourasghar, John Brigham</i>	Hydrodynamic Characteristics of Shape Morphing Curved-Crease Origami Surfaces <i>Hardik Patil*, Evgueni Filipov</i>	An Attack on Non-Triangular Flexible Polyhedral Surfaces <i>Zeyuan He*, Simon Guest</i>	
Shaffer 302	#M310	Computational Methods for Stochastic Engineering Dynamics, Chair(s): Ioannis Kougoumtzoglou		
A Wiener Path Integral Quadratic Approximation for Stochastic Response Determination of Nonlinear Multi-Degree-of-Freedom Systems <i>Ying Zhao, Apostolos Psaros, Ioannis Petromichelakis, Ioannis Kougoumtzoglou*</i>	Stochastic Response Determination of Nonlinear Dynamical Systems: A Wiener Path Integral Technique Accounting for Fractional Derivative Modeling <i>Ilias Mavromatis*, Ioannis Kougoumtzoglou, Apostolos Psaros</i>	Survival Probability Determination of Nonlinear Oscillators with Fractional Derivative Terms Under Evolutionary Stochastic Excitation <i>Vasileios Fragkoulis*, Ioannis Kougoumtzoglou</i>	Data-Driven Parsimonious Modeling and Analysis of Dynamic Cerebral Autoregulation via Diffusion Maps <i>Maria Katsidoniotaki*, Ketson Roberto Maximiano Dos Santos, Eliza Miller, Ioannis Kougoumtzoglou, Randolph Marshall</i>	
Hodson 313	#M312	Structural Instabilities: From Failure to Function, Chair(s): Stylianos Yiatros		
A Building-Block Approach to the Conceptual Design of Shape Adaptive Structures <i>Ed Wheatcroft*, Rainer Groh, Mark Schenk, Jiajia Shen, Alberto Pirrera</i>	Stochastic Analysis of Buckling Load of Beams on Elastic Foundation <i>Zheren Baizhikova*, Jia-Liang Le, Roberto Ballarini</i>	Experimental vs. Numerical Stability Assessment of Anisotropic Laminated Web Cantilever Beams Under Tip Force <i>Garima Sharma*, Hayder Rasheed</i>	Stability of Stainless Steel Frames with Different Beam-to-Column Connection Types <i>Mohammed M. Eladly*, Benjamin W. Schafer</i>	Cross-Section Instability of Advanced High Strength Steel Thin-Walled Members <i>Chu Ding*, Benjamin Schafer</i>

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Latrobe 107	#M313	Analysis of Heritage Structures: Tools and Methods for Assessing Unknowns in Historic Monuments and Structures, Chair(s): Linda Seymour		
Investigating Lost Heritage Structures: Digital Reconstruction of Vezir's Great Bridge <i>Andronira Burda, James McDonagh, Moriah Hughes, Branko Glisic*</i>	Effect of Sloping Sand/Bedrock Interface on the Static and Dynamic Response of the Adobe Pyramid of Huaca de la Luna, Peru <i>Anna Remus, Lale Yilmaz, Selman Tezcan, Renato Perucchio*</i>	Dealing with Multiscale Complexity and Uncertainty for the Case of the Thin-Shell Classrooms of Cuba's Historic School of Ballet <i>Moriah Hughes*, Shengzhe (Jackson) Wang, Maria Garlock, Branko Glisic</i>	Rapid Generation of Numerical Models for Cultural Heritage Structures Conservation <i>Antonio Maria D'Altri*, Branko Glisic, Stefano de Miranda, Rebecca Napolitano</i>	
Hodson 316	#M315	Coupled Chemical, Physical and Mechanical Processes in Cementitious Materials for Regular and 3D Printed Constructions, Chair(s): Roman Wan-Wendner / Mohammed Alnaggar		
Algorithms to Optimize the Printing Ink for 3D Printing <i>Claudiane Ouellet-Plamondon*</i>	On the Emergence of 3D Printable Engineered Cementitious Composites: Extrudability and Buildability Evaluation <i>Muhammad Saeed Zafar*, Amir Bakshi, Maryam Hojati</i>	Additive Manufacturing of Carbonated Cementitious Materials <i>Paula Bran Anleu*, Yann Le Pape, Qiyi Chen, Parans Paranthaman, Rigoberto Advincola, Brian Post, Celeste Atkins, Adam Brooks, Elena Tajuelo Rodriguez</i>	Improving Printability and Sustainability of Cementitious Mixtures Using Cellulose Filaments <i>Ugur Kilic*, Ahmed Omran, Osman Ozbulut</i>	Chemomechanical Properties of 3D Printed Cement Pastes Containing Halloysite Nanoclay <i>Michael Kosson*, Lesa Brown, Florence Sanchez</i>
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): Mazdak Tootkaboni		
A Topology Optimization Framework for Multi-material Design <i>Alireza Asadpoure*, Mohammad Minhajur Rahman, Seyed Ardalan Nejat, Navid Changizi, Mazdak Tootkaboni</i>	Topology Optimization of District Heating Networks Using a SIMP-Like Multi-Material Penalization <i>Yannick Wack*, Robbe Salenbien, Tine Baelmans, Maarten Blommaert</i>	Topology Optimization with Filament Interface Considerations for Extrusion-Based Additive Manufacturing Processes <i>Hajin Kim*, Jackson Jewett, Josephine Carstensen</i>	Optimization of Local Topology and Stacking Sequence in Laminated Composites Considering Strength Criteria <i>Chuan Luo*, Federico Ferrari, James Guest</i>	

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Shaffer 100	#M406	Probabilistic Assessment, Inference, and Optimization Under Uncertainty, Chair(s): Charalampos Andriotis		
Accurate Wildfire Prediction by Geostationary Orbit Satellites and Rate of Spread Adjustment Factor <i>Seungmin Yoo*, Junho Song</i>	Short-Term Heat-Induced Risk Assessment of Urban Scale Energy Systems <i>Byeongseong Choi*, Mario Berges, Matteo Pozzi</i>	An Efficient Seismic Reliability Method Accounting for Stochastic Earthquake Model Parameters <i>Xuanli Sun*, Martin Williams, Manolis Chatzis</i>	Simulation Free Adaptive Reliability Analysis Method for Structures Under Stochastic Loadings <i>Chi Zhang*, Abdollah Shafieezadeh</i>	
Shaffer 300	#M407	Advances in Computational Methods for Uncertainty Quantification and Robust/Performance-Based Design of Structures and Systems Exposed to Natural and Man-Made Hazards, Chair(s): Arthriya Subgranon		
Impact of Hazard Uncertainty Evolution on Variability of Building Seismic Damage Assessment <i>Jorge Mario Lozano*, Iris Tien, Elliot Nichols, J. David Frost</i>	Collapse Reliability of High-Rise Reinforced Concrete Structures Under Extreme Winds <i>Liuyun Xu*, Seymour Spence</i>	Optimal Generation of Multivariate Hurricane Intensity Maps Using Multivariate Hazard Quantization <i>Liyang Ma*, Daniel Conus, Wei-Min Huang, Paolo Bocchini</i>	Enabling Uncertainty Quantification Across SimCenter Modules for Simulation in Natural Hazards Engineering <i>Aakash Bangalore Satish*, Sang-ri Yi, Joel P Conte, Alexandros Taflanidis</i>	Subset Simulation-Based Stratified Samplings for Rare Event Simulation in Wind Engineering <i>Srinivasan Arunachalam*, Seymour Spence</i>
Krieger 302	#M503	Junction Flows, Local Scour Processes and Mitigation Strategies in Riverine and Coastal Environments, Chair(s): Celso Castro-Bolinaga / Aly Mousaad Aly / Panayiotis Diplas		
Initiation of Motion Conditions in a Turbulent Boundary Layer Flow in Aeolian and Fluvial Environments <i>Hridaya Bastola, Cheng Chen, Panayiotis Diplas*</i>	Reynolds-Averaged Simulation of Langmuir Turbulence in the Coastal Ocean <i>Juan Penaloza Gutierrez*, Andres Tejada-Martinez</i>	Ignition of Self-Supported Turbidity Currents via Waves and Currents <i>Celalettin Ozdemir*, George Xu, Samuel Bentley</i>	Evaluation of Distributed Temperature Sensing to Improve Scour Predictions at Bridge Crossings <i>Celso Castro-Bolinaga*, Rebecca Hatley, Chadi Sayde, Mahmoud Shehata</i>	

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Shaffer 304	#M609	Analysis and Prediction of Wind Effects on the Built Environment, Chair(s): Marco Giometto		
Large-Eddy Simulation of Cross-Ventilation: Sensitivity Analysis and Comparison of Different Measures of Ventilation	A Comparative Study on Life-Cycle Cost of a Tall Concrete Core-Wall Building Using Prescriptive and Performance-Based Wind Designs	Predicting Wildfire Ignition Induced by Conductor-Vegetation Contact Under High Winds	Wind-Induced Vortex Interaction on T-Shaped Bluff Bodies	
<i>Yunjae Hwang*, Catherine Gorle</i>	<i>Baichuan Deng*, Teng Wu</i>	<i>Xinyue Wang*, Paolo Bocchini</i>	<i>Chia Mohammadjani*, Manuel Matus, Ioannis Zisis</i>	
Shaffer 202	#M613	Recent Advances in Response Modification Devices and Strategies, Chair(s): Nicos Makris		
Design of Force-Limiting Deformable Connections in High-Performance Earthquake-Resilient Buildings	Can a Pure Rocking Model Describe the Rolling of Curved Objects like Disks, Tops, and Gömböcs?	Seismic Analysis of Buildings Retrofitted with Adjacent Viscoelastically Damped Structures	Characterization and Modeling of the Multi-Directional Behavior of Rolling Pendulum Isolation Systems for Critical Building Contents	
<i>Georgios Tsampras*, Richard Sause</i>	<i>M. David Burton*, Manolis N. Chatzis</i>	<i>Mariateresa Lombardo, Giuseppe Carlo Marano, Alessandro Palmeri*</i>	<i>Esteban Villalobos Vega*, P. Scott Harvey, James M. Ricles, Liang Cao, Daleen M. Torres Burgos</i>	
Krieger 300	#M702	Uncertainty Quantification-Aided Machine Learning in Engineering for Hazards, Chair(s): Som Dhulipala / Michael Shields / Henry Burton		
Active Learning with Multi-Fidelity Modeling for Probability of Failure Estimation	Machine Learning Based Bridge Load Posting Prediction and Associated Uncertainties	Graph Neural Networks for Efficient Seismic Reliability Analysis of Highway Bridge Systems		
<i>Promit Chakroborty*, Michael Shields, Somayajulu Dhulipala</i>	<i>Sai Bandaru, Sabarethinam Kameshwar*</i>	<i>Tong Liu, Hadi Meidani*</i>		

TS 3: WEDNESDAY EVENING, JUNE 1

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Shaffer 303	#M703	Civil Engineering and Artificial Intelligence: Where to go from here?, Chair(s): Thomas Gernay		
Leveraging Machine Learning to Predict the Structural Capacity of Slender Steel Members at Elevated Temperature <i>Qi Tong*, Carlos Couto, Thomas Gernay</i>	Probabilistic Data Analytics for Improved Closest Hospital Suggestion in New York City <i>Audrey Olivier*, Matthew Adams, Sevin Mohammadi, Andrew Smyth, Kat Thomson, Edward Dolan</i>	Design of Structural Steel Hollow Sections Using Machine Learning Techniques <i>Hyeyoung Koh*, Hannah Blum</i>	Genetic Algorithm-Based Frameworks for Optimized Design of Seismic Retrofitting of Masonry and Reinforced Concrete Frame Structures <i>Fabio Di Trapani*, Antonio Pio Sberna, Marco Martino Rosso, Giuseppe Carlo Marano</i>	
Krieger 170	#M802	Computational Geomechanics 2022, Chair(s): Qiushi Chen		
Optimizing 3D Fabric Tensor Calculation from 2D Images Using Artificial Neural Networks <i>Daniel Chou*, Chloe Arson</i>	Characterization and Simulation on the Flow of Particulate Milled Biomass <i>Yimin Lu*, Wencheng Jin, Jordan Klinger, Sheng Dai</i>	Ant Nest Geometry, Stability and Excavation - Inspiration for Tunneling <i>Meron Belachew*, Karie Yamamoto, Elliot Nichols, Danrong Zhang, J. David Frost, Chloé Arson</i>	Seismic Performance of Pile Foundations in Liquefiable Soils Considering Material and Geometric Nonlinearities <i>Majid Manzari*</i>	Optimizing Soil Simulations Using the Discrete Element Method (DEM) <i>Karam Jaradat*, Sherif Abdelaziz</i>
06:00 PM	06:20 PM	06:40 PM	07:00 PM	07:20 PM
Glass Pavilion	Special Panel: Joint USACM Large-Scale TTA – EMI Computational Mechanics Committee Career Path Panel, Chair: Michael Hillman			
<p>This special panel will feature researchers from the academia, national labs, and the industry, and it will discuss different career options. Topics to be covered by the panel include career paths, career development options, work-life balance, and mentorship. The panel will be followed by a networking session.</p> <p>The panelists: Patrick Diehl (Louisiana State University), George Gazonas (CCDC Army Research Laboratory), Ghadir Haikal (Southwest Research Institute), Arturo Montoya (University of Texas at San Antonio), Pablo Seleson (Oak Ridge National Laboratory), and Dakshina Valiveti (ExxonMobil).</p>				

Parallel Technical Sessions

Thursday, June 2

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Hodson 210	#M101	The Next Frontiers in Natural Hazards Engineering: Advancing the Vision of Ahsan Kareem, Chair(s): Alexandros Taflanidis			
Monte Carlo Simulation in Civil Engineering and Engineering Mechanics <i>George Deodatis*</i>	Accelerating Bayesian FE Model Updating via Surrogate Models: Application to a Miter Gate <i>Mukesh Ramancha*, Manuel Vega, Joel Conte, Michael Todd, Zhen Hu</i>	From Randomness to Determinism and the Emergence of Bulk Viscoelastic Properties <i>Nicos Makris*</i>	Modeling of Wildfire Propagation: A Stochastic Level-Set Formulation <i>Armin Tabandeh*, Paolo Gardoni</i>		
Hodson 301	#M202	Cementitious Materials: Experiments and Modeling Across the Scales, Chair(s): Christian Hellmich			
Micromechanics of Cementitious Composites with X-Ray Tomography and Diffraction <i>Ryan Hurley*, Darren Pagan, Eric Herbold, Chongpu Zhai</i>	Role of Subscale Heterogeneities on Local Stresses and Strains in Concrete Using X-Ray Computed Tomography and Mesoscale Simulations <i>Mohmad Mohsin Thakur*, Ryan Hurley</i>	In Situ Raman Spectroscopy of Ye'elimite Clinker <i>Yangwoo Lee*, Hee-Jeong Kim, Juhyuk Moon</i>	Investigations of Dual Probe Nondestructive Evaluation of Concrete <i>Justin Harris, Eric Landis*</i>		
Hodson 213	#M203	Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering, Chair(s): Johann Guilleminot			
Data-Driven Microstructure Evolution Using Physics Regularized Interpretable Machine Learning Microstructure Evolution (PRIMME) <i>Joseph Melville, Weishi Yan, Kristien Everett, Lin Yang, Vishal Yadav, Amanda Krause, Michael Tonks, Joel B. Harley*</i>	Data-Driven Multiscale Model for Fiber Composite Properties <i>Philippe Hawi*, Roger Ghanem, Venkat Aitharaju</i>	Bayesian Calibration of Models for Diblock Copolymers Self-Assembly with Power Spectrum of Microscopy Image Data <i>Lianghao Cao*, Keyi Wu, Peng Chen, J. Tinsley Oden, Omar Ghattas</i>	A Novel Physics-Informed General Convolutional Network Framework for the Computational Modeling of Material Damage <i>Ghadir Haikal*, Michael Hartnett, Matthew Kirby, Jake Janssen, Erin DeCarlo, Fassett Hickey</i>		

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Hodson 315	#M204	Architected Materials, Chair(s): Shelly Zhang			
Keynote presentation: Architected Material Analogs for Shape Memory Alloys <i>Yunlan Zhang, Kristiaan Hector, Mirian Velay Lizancos, David Restrepo, Nilesh Mankame, Pablo Zavattieri*</i>		Fractal Lattices Lead to Improved Energy Dissipation <i>Zhennan Zhang*</i>	Energy-Based Fracture Mechanics of 2D Lattice Materials <i>Shengzhi Luan, Enze Chen, Stavros Gaitanaros*</i>	Tough Nacre-Like Cement Paste-Silicon Architected Composites <i>Hadi Shagerdi Esmaeeli*, Reza Moini</i>	
Hodson 303	#M207	Dispersive Waves and Shock in Solid Domains with Micro-Structure, Chair(s): Thomas Plaisted			
Linear and Fracture Response of an Elastodynamic Metamaterial to Impact Loading <i>Reza Abedi, Giang Huynh*, Willoughby Cheney, Weidi Wang, Alireza V. Amirkhizi</i>	Design and Experimental Verification of Mechanical Metamaterials for Vibration Attenuation <i>Weidi Wang, Joshua Morris, Thomas A. Plaisted*, Bradley D. Lawrence, Christopher Hansen, Alireza V. Amirkhizi</i>	Longitudinal Impact into Micropolar Bodies <i>George Gazonas*, Charles Radow</i>	Converging Shock Driven Surface Instabilities in Soft Hydrogels <i>Daniel Pickard*, Dmitro Martynowych, Jet Lem, Anwar Koshakji, Shaoting Lin, Xuanhe Zhao, Keith Nelson, Bianca Giovanardi, Raul Radovitzky</i>		
Krieger 170	#M208	Mechanics and Physics of Granular Materials, Chair(s): Anil Misra / Payam Pooorolhjouy			
Relation Between Void Ratio and Contact Fabric of Granular Soils <i>Yuxuan Wen*, Yida Zhang</i>	Homogenization-Based Optimization of Lattice Structure Using Granular Micromechanics Approach <i>Kehinde Omotayo*, Samal Aminashairi, Ranganathan Parthasarathy</i>	A 3D Modeling of the Impact of Internal Erosion on the Stability of Engineering Structures <i>Pierre-Yves Hicher*, Jie Yang, Zhen-Yu Yin, Farid Laouafa</i>	Macroscopic and Microscopic Derivation of Higher Order Elasticity Tensors for Different Material Symmetry Groups <i>Payam Pooorolhjouy*, Pouriya Pirmoradi, Akke Suiker</i>	Structural Phase Transition in a Simplex Tensegrity <i>Armin Motadel, Kehinde Omotayo*, Ranganathan Parthasarathy</i>	Boundary Layers and Natural Frequencies Predicted Using Granular Micromechanics Based 1D Micromorphic Model <i>Anil Misra*</i>

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Krieger 300	#M209	Coupled Processes in Natural and Synthetic Porous Media: Experimental and Numerical Studies, Chair(s): Pania Newell			
Modeling of Creep Behavior in Shale Rocks Induced by Chemo-Mechanical Loading <i>Ravi Prakash*, Venkata Radha Sai Bhavana Varanasi, Jeffrey Bullard, Sara Abedi</i>	Upscaling Thermal and Mechanical Parameters for Second-Graded Porous Materials <i>Bozo Vazic*, Pania Newell</i>	A Molecular Dynamics Study of the Interplay Between Nanopores and Pre-Existing Fracture <i>Pania Newell*</i>			
Hodson 216	#M214	Integrated Computational Materials Engineering (ICME) Mini-Symposium, Chair(s): Mohammadreza Yaghoobi			
Contact Creep and Friction of Nickel-Based Inconel 617 Superalloy at Elevated Temperatures; Indentation Experiments and Finite Element Analysis <i>Sepehr Salari, MdSaifur Rahman, Andreas Polycarpou, Ali Beheshti*</i>	Coupled Artificial Intelligence and Classical Constitutive Model to Predict the Concrete Response Under the Extreme Loading <i>Taehyo Park, Bilal Ahmed*, Jong-Su Jeon</i>	Physics-Based Constitutive Equation for Thermo-Chemically Aged Elastomers Based on Crosslink Density Evolution <i>Aimane Najmeddine*, Maryam Shakiba</i>	Developments in Carbon Fiber Rod Analysis for Sporting Goods Applications <i>Connor Quigley*</i>		
Shaffer 300	#M215	Computational Methods and Applications for Solid and Structural Mechanics, Chair(s): Soheil Soghrati			
Keynote presentation: An Inelastic Model with Embedded Bounce-Back Control and a Ghost Mesh Technique for Layered Printing with Cementitious Materials <i>Arif Masud*, Ignasius Wijaya</i>		The Shifted Boundary Method for Computational Mechanics <i>Guglielmo Scovazzi, Nabil Atallah*, Kangan Li, Antonio Rodriguez-Ferran</i>	A Combined Variational Multiscale Stabilization and Enrichment Method for Problems with Material Heterogeneity <i>Pinlei Chen*, Hye-eun Kong</i>	A Combined Phase Field and Variational Multiscale Approach for Modeling Thermomechanical Frictional Cracks <i>Wan Wan*, Pinlei Chen</i>	Elasto-Plastic Hourglass Control for Physically Stabilized Non-Linear Finite Elements with Reduced Integration <i>Brian Giffin*</i>

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Hodson 211	#M217	Seventh Symposium on Molecular Scale Modeling and Experimentation, Chair(s): Kalpana Katti			
<p>Unraveling the Mechanisms of Severing of Cellular Actin Filaments During Cancer Progression</p> <p><i>Dinesh Katti*, Sharad Jaswandkar, Kalpana Katti</i></p>	<p>A Coarse-Grained Model for The Mechanical Behavior of Na-Montmorillonite Clay</p> <p><i>Sarah Ghazanfari*, H. M. Nasrullah Faisal, Kalpana S. Katti, Dinesh R. Katti, Wenjie Xia</i></p>	<p>A Machine Learning Approach to Predict the Glass Transition Temperature of Conjugated Polymers from Chemical Structure</p> <p><i>Amirhadi Alesadi*, Zhiqiang Cao, Zhaofan Li, Xiaodan Gu, Wenjie Xia</i></p>	<p>Mechanical Behavior and Dynamic Properties of Polymer - Clay Nanocomposites</p> <p><i>Wenjian Nie*, Yangchao Liao, Wenjie Xia</i></p>	<p>Unified Thermal Transport in Crystalline Cellulose Iβ</p> <p><i>Zhiyu Liu*, Peter Chung</i></p>	<p>Understanding the Size Effects on Crumpling Behaviors of Nanoribbons</p> <p><i>Yangchao Liao*, Wenjie Xia, Wenjian Nie, Zhaofan Li</i></p>
Hodson 305	#M223	Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications, Chair(s): Mike Hillman			
<p>Keynote presentation: Physics-Informed Neural Network Enhanced Reproducing Kernel Particle Method for Modeling Grain Refinement</p> <p><i>Jiun-Shyan Chen, Jonghyuk Baek*, Kristen Susuki</i></p>	<p>An Ultra-high Speed Reproducing Kernel Particle Method</p> <p><i>Siavash Jafarzadeh*, Michael Hillman</i></p>	<p>Fast Convolution-Based Peridynamics for Modeling Plasticity and Ductile Fracture</p> <p><i>Farzaneh Mousavi*, Siavash Jafarzadeh, Florin Bobaru</i></p>	<p>A Fracture Multiscale Model for Peridynamic Enrichment Within the Partition of Unity Method: Part I</p> <p><i>Patrick Diehl*</i></p>	<p>RKPM for Duality-Based Coupling of Cosserat Crystal Plasticity and Phase Field Theories for Modeling Grain Refinement</p> <p><i>Jonghyuk Baek*, J. S. Chen, Michael Tupek, Frank Beckwith, H. Eliot Fang</i></p>	
Shaffer 304	#M225	Integration of Physics-Based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification, Chair(s): Hamed Ebrahimian			
<p>Keynote presentation: Finite Element Model Updating with Vibration Testing Data: A Non-Convex Optimization Perspective</p> <p><i>Yang Wang*, Yu Otsuki</i></p>	<p>Damage Localization Framework Using Physics-Based Modeling and Topology Optimization</p> <p><i>Borna Rahnamay Farnod*, Wesley Reinhart, Rebecca Napolitano</i></p>	<p>Identification of Force, Parameters, and Response for Wind-Excited Structures</p> <p><i>Marios Impraïmakis*, Andrew Smyth</i></p>	<p>RFID-Based Crack Prediction for Concrete Structures Under Environmental Uncertainty Using Machine Learning</p> <p><i>Pierredens Fils*, Shinae Jang</i></p>	<p>Damage Estimation and Condition Monitoring in Structural Systems Using Parametric Reduced Order Models and Limited Output Measurements</p> <p><i>Konstantinos Vlachas*, Konstantinos Tatsis, Anthony Garland, Carianne Martinez, Eleni Chatzi</i></p>	

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Eleni Chatzi			
<p>Keynote presentation: Joint Estimation of Input Loads, Structural Parameters, and Dynamic States</p> <p><i>Marios Impraimakis, Andrew Smyth*</i></p>	<p>Structural Model Inference and Response Prediction Based on Hierarchical Bayesian Framework and Gaussian Process Regression</p> <p><i>Antonina Kosikova*, Omid Sedehi, Costas Papadimitriou, Lambros Katafygiotis</i></p>	<p>On the Observability of Discrete Systems with Unmeasured Inputs</p> <p><i>Manolis Chatzis*, Kristof Maes, Geert Lombaert</i></p>	<p>Calibration of Material Constitutive Model Using Hierarchical Bayesian Inference</p> <p><i>Maitreya Manoj Kurumbhati*, Mukesh Kumar Ramancha, Aakash Bangalore Satish, Joel Conte, Koorosh Lotfizadeh, Jose Restrepo</i></p>	<p>An Approximate Bayesian Perspective on Model Falsification with Applications to Parameter Inference and Model Selection of Dynamical Systems</p> <p><i>Agnimitra Dasgupta*, Erik Johnson</i></p>	
Hodson 313	#M312	Structural Instabilities: From Failure to Function, Chair(s): M. Ahmer Wadee			
<p>Keynote presentation: Parallel Buckling Constrained by Adjacent Members</p> <p><i>Lawrence Virgin*</i></p>	<p>Interrogating the Configuration Space of an Axially-Loaded Frame Structure</p> <p><i>Lawrence Virgin, Charles Cervi*</i></p>	<p>A von Kármán-Type Model for the Elastic Buckling Behavior of Two-Layer Laminated Glass Plates and its Finite Element Approximation</p> <p><i>Viviane Setti Barroso*, Anísio Andrade, Noël Challamel, Paulo Providência</i></p>	<p>Enabling Local Buckling Calculations in Design</p> <p><i>Muhie Dean Ahdab*, Astrid Fischer, Chu Ding, Bob Glauz, Benjamin Schfaer</i></p>	<p>Numerical/Experimental Study of Self-Healing Under Sustained Loadings in Concrete</p> <p><i>Roman Wan-Wendner*, Giovanni Di Luzio, Salam M.J. Al-Abaidi, Yilin Wang, Marco Davolio, Liberato Ferrara</i></p>	

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): Josephine V. Carstensen			
<p>Keynote presentation: Topology Optimization with Spatially Varying Length Scale</p> <p><i>Oded Amir*</i></p>		<p>A New Regularization Approach for Topology Optimization with Discrete Objects</p> <p><i>Julia Carroll*, James Guest</i></p>	<p>Comparison of 3D Printed Topology-Optimized Structures Designed with Different Modelling Resolutions</p> <p><i>Jackson Jewett*, Grace Harrington, Josephine Carstensen</i></p>	<p>A Comparative Study of Methods for Two-Phase Minimum Length Scale Control in Topology Optimization</p> <p><i>Christiaan Mommeyer*, Geert Lombaert, Mattias Schevenels</i></p>	
Krieger 308	#M404	Probabilistic Learning, Stochastic Optimization, and Digital Twins, Chair(s): Amir H Gandomi			
<p>Johansen Cointegration for Structural Condition Monitoring Under Environmental and Operational Variations Effect</p> <p><i>Mohsen Mousavi, Amir H Gandomi*</i></p>	<p>Probabilistic Learning on Manifolds for Liner Impedance for Design Optimisation</p> <p><i>Amritesh Sinha*, Christophe Desceliers, Christian Soize, Guilherme Cunha</i></p>	<p>Discovering Nonlinear Structural System Dynamics Based on Compressive Sampling Concepts and Tools</p> <p><i>G. D. Pasparakis*, V. C. Fragkoulis, I.A. Kougioumtzoglou, M. Beer</i></p>			
Shaffer 100	#M406	Probabilistic Assessment, Inference, and Optimization Under Uncertainty, Chair(s): Charalampos Andriotis			
<p>Reliability-Redundancy-Recoverability-Based Decision Optimization (R3-DO) for Disaster Resilience of Structural Systems</p> <p><i>Seonghyun Lim*, Jungho Kim, Junho Song</i></p>	<p>Probabilistic Life-Cycle Multi-Objective Optimization and Decision Making for Managing Deteriorating Bridges and Bridge Networks</p> <p><i>Dan M. Frangopol*, Sunyong Kim</i></p>	<p>Stochastic Optimization of Risk-Constrained Management Policies for Deteriorating Systems Under State and Model Uncertainties</p> <p><i>Charalampos Andriotis*, Konstantinos Papakonstantinou</i></p>	<p>Understanding Network-Level Asset Management Policies Enabled by Deep Reinforcement Learning</p> <p><i>David Yang*</i></p>	<p>Optimal Maintenance Policy for Large-Scale Infrastructure Systems by Parallelized Multi-Agent Deep Reinforcement Learning</p> <p><i>Dongkyu Lee*, Junho Song</i></p>	

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Shaffer 202	#M603	Innovations and Advances in Passive, Active, and Semi-Active Structural Control, Chair(s): Nicholas Wierschem			
<p>The Curious Case of 166 TMDs in One Building</p> <p><i>Michael Wesolowsky*, Melissa Wong, Hannah Kim, Rabih Alkhatib</i></p>	<p>Magneto-Solid Damper: A New Generation of Friction Dampers with Smooth Hysteretic Behavior for Vibration Control of Civil Structures</p> <p><i>Mohsen Amjadian*, Anil Agrawal</i></p>	<p>Real-Time Hybrid Simulation of a Novel Tuned Mass Friction Damper on a Tall Building for Wind Hazard Mitigation</p> <p><i>Liang Cao*, Safwan Al-Subaihawi, Thomas Marullo, James Ricles, Austin Downey, Simon Laflamme</i></p>	<p>Exploring the Impact of Excitation and Structural Response/Performance Modeling Fidelity in the Design of Seismic Protective Devices</p> <p><i>Dimitrios Patsialis*, Alexandros Taflanidis, Agathoklis Giaralis</i></p>	<p>Shift in the Natural Frequencies of Structures with Multiple Variable Inertia Flywheels</p> <p><i>Anika Sarkar, Nicholas Wierschem*</i></p>	
Krieger 302	#M610	Recent Advances in Computational Modeling on Tropical Cyclone Induced Multi-Hazards, Chair(s): Chao Sun			
<p>Characterization of Coupled Turbulent Wind Wave Flows Based on Large Eddy Simulation</p> <p><i>Tianqi Ma*, Chao Sun</i></p>	<p>Data-Driven Estimation of Hurricane-Induced Wave Loads on Elevated Coastal Buildings Based on CFD Simulations</p> <p><i>Mohammad Moeini*, Nathan Brown, Ali Memari</i></p>	<p>Large Eddy Simulation of Wind Loading on Elevated Low-Rise Buildings</p> <p><i>Xiangjie Wang*, Chao Sun, Steve Cai</i></p>	<p>Investigating Structural Performance of the Elevated Slab Residential Buildings in the Coastal Regions</p> <p><i>Yong Yoo*, Maria Koliou, Nur Yazdani, Cedric Ling</i></p>	<p>Assessment of An Ensemble-Based Forecasting System for Storm Surge Prediction: A Case Study Using Tropical Cyclone Isaias</p> <p><i>Mahmoud Ayyad*, Philip Orton, Hoda El Safty, Muhammad Hajj</i></p>	
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Fernando Moreu / Jian Li			
<p>Keynote presentation: Human-Centered Steel Bridge Inspection Using Computer Vision and Augmented Reality</p> <p><i>Jian Li*, Rushil Mojidra, Ali Mohammadkhorasani, Fernando Moreu, William Collins, Caroline Bennett</i></p>	<p>Autonomous Robotic Defect Tracking for Infrastructure Maintenance</p> <p><i>Joshua Genova*, Vedhus Hoskere</i></p>	<p>AI-Enabled Drone Image Processing for Rapid Bridge Inspection and Management</p> <p><i>Yelda Turkan*, Donghoon Ji, Paolo Calvi</i></p>	<p>Human-Machine Collaborative Inspection Through Mixed Reality</p> <p><i>Zaid Al-Sabbag*, Chul Min Yeum, Sriram Narasimhan</i></p>	<p>Agent-Based Unmanned Aerial Vehicle in Simulated Environment for Collaborative Inspection</p> <p><i>Muhammad Rakeh Saleem*, Rebecca Napolitano</i></p>	

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Krieger 306	#M709	Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications, Chair(s): Gaofeng Jia			
<p>Integrated Node Condition Classifier in Storm Surge Surrogate Modeling</p> <p><i>Aikaterini P. Kyprioti*, Alexandros A. Taflanidis, Norberto C. Nadal-Caraballo, Madison O. Campbell</i></p>	<p>A Multi-fidelity Stochastic Simulation Scheme for Estimation of Small Failure Probabilities</p> <p><i>Min Li*, Srinivasan Arunachalam, Seymour Spence</i></p>	<p>Efficient Adaptive Design of Experiments Methods for Global Surrogate Modeling Based on Approximated Mean Squared Error and Multi-Criteria Search Technique</p> <p><i>Sang-ri Yi*, Alexandros Taflanidis</i></p>	<p>Active Learning for Global Sensitivity Analysis</p> <p><i>Mohit Singh Chauhan*, Mariel Ojeda-Tuz, Ryan Catarelli, Kurtis Gurley, Michael Shields</i></p>	<p>Prediction and Multi-Objective Optimization of Mechanical, Economical, and Environmental Properties for Strain-Hardening Cementitious Composites (SHCC) Based on Automated Machine Learning and Metaheuristic Algorithms</p> <p><i>Soroush Mahjoubi*, Yi Bao, Weina Meng</i></p>	<p>Joint Free-Form Model Evolution and Stochastic Parameter Estimation Using Symbolic Regression with Recurrent Neural Networks</p> <p><i>Weiran Lyu*, Shandian Zhe, Jacob Hochhalter, Robert "Mike" Kirby</i></p>
Shaffer 302	#M711	Recent Advances in Real-Time Hybrid Simulation, Chair(s): Wei Song			
<p>Decoupled Adaptive Model-Based Compensation for Multi-Axial Real-Time Hybrid Simulation</p> <p><i>Cristobal Galmez, Gaston Fermandois*</i></p>	<p>Cascade Control Method to Conduct Hybrid Simulation with Stiff Test Specimens</p> <p><i>Shawn You*, Shawn Gao, Brad Thoen, Catherine French</i></p>	<p>Multiaxial Real-Time Hybrid Simulation with Model Assisted Compensation</p> <p><i>X. Shawn Gao*, Michael Dembinski, Shawn You, Brad Thoen</i></p>	<p>Use of Machine Learning-Based Neural Network Models to Account for Soil-Foundation-Structure Interaction Effects in Real Time Hybrid Simulations</p> <p><i>Safwan Al-Subaihawi*, Thomas Marullo, James Ricles, Muhannad Suleiman, Spencer Quiel</i></p>	<p>Investigation of Self-Tuning Regulator Controllers for Real-Time Hybrid Simulation of Civil Engineering Structures</p> <p><i>Alejandro Palacio-Betancur*, Mariantonieta Gutierrez Soto</i></p>	M22

TS 4: THURSDAY MORNING, JUNE 2

10:00 AM	10:20 AM	10:40 AM	11:00 AM	11:20 AM	11:40 AM
Krieger 180	#M802	Computational Geomechanics 2022, Chair(s): Xiaoyu Song			
A Self-Consistent Approach to Interfaces of Variable Stiffness in Polycrystalline Materials Subject to Pressure Solution	On the Effects of Fabric on the Instability Surface of Granular Materials	Temperature Effects on the Diffused Double Layer Using Molecular Dynamics	An Overview of Micromorphic Theory and Its Recent Development for Thermomechanical-Electromagnetic Coupling	A Computational Nonlocal Poromechanics Model for Unguided Cracking in Unsaturated Porous Media	
<i>Tingting Xu*, Chloé Arson</i>	<i>Srinivas Vivek Bokkisa*, Jorge Macedo, Alexandros Petalas, Chloé Arson</i>	<i>Shijun Wei*, Sherif Abdelaziz</i>	<i>Jiaoyan Li*, James Lee</i>	<i>Shashank Menon, Xiaoyu Song*</i>	

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 211	#M201	Multiscale Behavior of Damage and Failure Mechanics, Chair(s): Xiaofan Zhang		
A New Anisotropic Elasto-Plastic-Damage Model for Quasi-Brittle Materials Using Strain Energy Equivalence <i>George Z. Voyiadjis, Yaneng Zhou*, Peter I. Kattan</i>	A Simple Implementation of Localizing Gradient Damage Model in Abaqus <i>Leong Hien Poh*, Yi Zhang</i>	A Phase-Field Formulation for Cohesive Fracture Based on the Park-Paulino-Roesler (PPR) Cohesive Fracture Model <i>Rogelio Muñeton-Lopez*, Oliver Giraldo-Londoño</i>	Effect of Microstructure and Surface Notch Geometry on Fatigue Crack Nucleation in Titanium Alloys <i>Ozge Ozbayram*, Shravan Kotha, Somnath Ghosh</i>	
Hodson 301	#M202	Cementitious Materials: Experiments and Modeling Across the Scales, Chair(s): Christian Hellmich		
Mixing Kinetics of Ultra-High-Performance Concrete (UHPC) <i>Jiang Du*, Soroush Mahjoubi, Yi Bao, Weina Meng</i>	Modeling of 3D printing Concrete Using the Reproducing Kernel Particle Method <i>Aleksandra Radlinska, Hanbin Cheng*, Feihong Liu, Michael Hillman</i>	Shrinking Fibers for Enhanced Durability of Concrete <i>Dryver Huston*, Diarmuid Gregory, Joshua Allen, Robert Worley II, Zhuang Liu</i>	A Numerical Investigation of Well Plugging Scenarios Using the Lattice Boltzmann Method <i>Carlos Garcia*, Ellis Rosenbaum, Julie Vandenbossche, Anthony Iannacchione, Naser Sharifi, John Brigham</i>	
Hodson 213	#M203	Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering, Chair(s): Michael Shields		
Surrogate Modeling for Engineering Problems with High-Dimensional Input and Output <i>Yulin Guo*, Sankaran Mahadevan, Shunsaku Matsumoto, Shunsuke Taba, Daigo Watanabe</i>	Predicting Plasticity in 2D Model Metallic Glasses Using the Local Yield Stress and Diffusion Maps <i>Rahul Meena*, Thomas J. Hardin, Spencer Fajardo, Michael Chandross, Michael Falk, Michael D. Shields</i>	PI-VAE: Physics-Informed Variational Auto-Encoder for Stochastic Differential Equations <i>Weiheng Zhong, Hadi Meidani*</i>	A Data-Driven Bayesian Crack Nucleation Model for Fatigue in Ni-Based Superalloys <i>George Weber*, Maxwell Pinz, Somnath Ghosh</i>	

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 315	#M204	Architected Materials, Chair(s): Hadi Shagerdi Esmaeeli		
<p>Inverse Design of Multimaterial Structures for Realization of Arbitrary Programmed Mechanical Responses</p> <p><i>X. Shelly Zhang*, Weichen Li, Fengwen Wang, Ole Sigmund</i></p>	<p>In-Situ Micro-Mechanical Testing of 3-D Architected Porous Structure</p> <p><i>Seo Young Ahn*, Brett Reeder, Bozo Vazic, Robert Wheeler, Pania Newell</i></p>	<p>Data-Based Techniques for Structure-Property Correlation in Periodic and Aperiodic Metamaterials</p> <p><i>Shengzhi Luan*, Enze Chen, Stavros Gaitanaros</i></p>	<p>Three-Dimensional Printing of High-Sensitivity Micro-Architected Piezoelectric Hydrophone with Designed Beam Pattern</p> <p><i>Haotian Lu*, Victor Couedel, Huachen Cui, Rayne Zheng</i></p>	<p>Exploring Permeability-Porosity Relations in Architected Materials</p> <p><i>Michael Vladimirov*, Stavros Gaitanaros, James Guest</i></p>
Hodson 305	#M206	Waves in Elastic Metamaterials and Phononic Crystals, Chair(s): Loukas Kallivokas		
<p>Asymptotic Analysis of Berry Phase Governed by the Scalar Wave Equation</p> <p><i>Bojan Guzina*, Othman Oudghiri-Idrissi, Shixu Meng</i></p>	<p>A Novel Identification Procedure of Mass-in-Mass Metamaterials Endowed with Cubic Oscillators</p> <p><i>Fabrizio Aloschi*, Oreste Salvatore Bursi</i></p>	<p>Model Order Reduction Using Proper Generalized Decomposition for the Prediction of Railway Induced Vibration</p> <p><i>Thomas Alexiou, Geertrui Herremans, Pieter Reumers, Geert Degrande*, Stijn François</i></p>	<p>Effect of Symmetry Breaking on the Elastic Wave Response of Gyroid Structures</p> <p><i>Maria Jose Carrillo-Muñoz*, Saranchana Keattitorn, Bhisham Sharma</i></p>	<p>Artificial Neural Networks for Identifying Incoming Seismic Wave Motion into Heterogeneous Soil Columns</p> <p><i>Shashwat Maharjan*, Bruno Guidio, Chanseok Jeong</i></p>
Krieger 170	#M208	Mechanics and Physics of Granular Materials, Chair(s): Mahdia Hattab / Pierre-Yves Hicher		
<p>SPH-DEM Modeling of Flow Liquefaction</p> <p><i>Usama El Shamy*, Saman Sizkow</i></p>	<p>Sea Ice Summer Decline: LS-DEM Simulation Using MODIS Data</p> <p><i>Rigoberto Moncada Lopez*, Mukund Gupta, Andrew Thompson, Jose Andrade</i></p>	<p>DEM Study of Two Types Of Direct Simple Shear (DSS) and Stress Tensor Computation</p> <p><i>Yu-Hsuan Lee*, Beichuan Yan, Richard Regueiro, Zhou Lei</i></p>	<p>Hierarchy of Structural and Mechanical Length Scales in Granular Systems</p> <p><i>Ghassan Shahin*, Ryan Hurley</i></p>	<p>Discrete Element Modeling of Granular Hopper Flow Using Hysteretic Nonlinear Contact Models</p> <p><i>Feiyang Chen*, Qiushi Chen, Yidong Xia</i></p>

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Krieger 300	#M209	Coupled Processes in Natural and Synthetic Porous Media: Experimental and Numerical Studies, Chair(s): Pania Newell		
<p>Bench-Scale Laboratory Experiments and Coupled Thermo-Hydro-Mechanical-Chemical Modeling for Understanding the Behavior of Bentonite Under High Temperature Heating and Hydration</p> <p><i>Sangcheol Yoon*, Sharon Borglin, Chun Chang, Chunwei Chou, Liange Zheng, Yuxin Wu</i></p>	<p>Coupled Flow-Deformation Analyses in Creeping Landslides Catastrophic Acceleration</p> <p><i>Xiang Li*, Giuseppe Buscarnera</i></p>	<p>Simulating the Mechanical Response of Chemically Active Geomaterials via Machine Learning-Generated Synthetic Microstructures</p> <p><i>Winston Lindqwister*, Alexandre Guevel, Manolis Veveakis</i></p>		
Shaffer 300	#M215	Computational Methods and Applications for Solid and Structural Mechanics, Chair(s): Xiang Zhang		
<p>AI-Enhanced Advanced Algorithms for the Micromechanical Modeling and Design of Materials with Complex Microstructures</p> <p><i>Soheil Soghrati*, Pengfei Zhang, Mohamad Mohamadsalehi, Mingshi Ji, Salil Pai, Abhijit Kale, Balavignesh Vemparala</i></p>	<p>Finite Strain FE2 Analysis with Data-Driven Homogenization Using Deep Neural Networks</p> <p><i>Nan Feng*, Guodong Zhang, Kapil Khandelwal</i></p>	<p>Admissible Unconstrained Neural Network Surrogates for Hyperelastic Constitutive Models</p> <p><i>Peiyi Chen*, Johann Guilleminot</i></p>	<p>A High-Order Generalized Finite Element Method with Adaptive Global-Local Enrichments for Structural Dynamics and Wave Propagation</p> <p><i>Alfredo Sanchez-Rivadeneira*, Carlos Duarte</i></p>	<p>Coupling 3D Solid and Shell Models with a Non-Intrusive Iterative Global-Local Algorithm</p> <p><i>Javier Avecillas Leon*, Haoyang Li, Nathan Shauer, Armando Duarte</i></p>
Latrobe 107	#M216	Quasibrittle Fracture of Heterogeneous Composites: Modeling and Characterization, Chair(s): Kedar Kirane		
<p>Keynote presentation: Are Configurational Forces Real Forces</p> <p><i>Roberto Ballarini*, Gianni Royer-Carfagni</i></p>		<p>A Study on the Bond Between GFRP Bars and Concrete: Fracture Tests of Notched Beams</p> <p><i>Mohammad Minhajur Rahman, Xudong Zhao, Christian Carloni*</i></p>	<p>Using Scratch Tests to Investigate the Rate-Dependence of the Fracture Response of Carbon Nanofiber-Reinforced Cement</p> <p><i>Ange-Therese Akono*</i></p>	<p>A Stochastic Peridynamic Model for Quasi-Brittle Fracture in Heterogeneous Materials</p> <p><i>Florin Bobaru*, Jiangming Zhao, Ziguang Chen</i></p>

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Latrobe 120	#M218	Advances and Applications of Elasticity Within Applied Mechanics, Chair(s): Evgueni Filipov		
Problems of the Coupled Theory of Thermoelasticity for Materials with Double Porosity <i>Merab Svanadze*</i>	Higher Order Modeling of Thin Layers in Conductivity and Elasticity <i>Sofia Mogilevskaya*, Svetlana Baranova, Volodymyr Kushch</i>	Influence Functions for 3D Full-Spaces Subjected to Bi-Quadratically Distributed, Time-Harmonic Loads <i>Edivaldo Romanini, Josue Labaki*, Iago Cavalcante, Euclides Mesquita</i>	On the Coupling of Structural Degrees of Freedom in Transient Soil Structure Interaction for Non-Parallel Soil Layers <i>Amauri Ferraz, Ronaldo Carrion, Lucas Agatti Pacheco, Euclides Mesquita*</i>	
Hodson 210	#M223	Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications, Chair(s): Pablo Seleson		
Recent Advances in Correspondence-Based Peridynamics: Thin Shells <i>Yuri Bazilevs*, Masoud Behzadinasab</i>	Overcoming Volumetric Locking in Higher Order Material Point Methods <i>Georgios Moutsanidis*</i>	Nodally-integrated RKPM for Deposition-based Three-dimensional Printing <i>Michael Hillman*, Kuan Chung Lin, Feihong Liu, Hanbin Cheng, Jiarui Wang, Aleksandra Radlinska</i>	An Upwind Reproducing Kernel Collocation Method for Convection-Dominated Problems <i>Jiarui Wang*, Michael Hillman</i>	Multiscale Modeling of Metal-Ceramic Spatially Tailored Materials via Gaussian Process Regression and Peridynamics <i>Shaoping Xiao*</i>
Shaffer 304	#M225	Integration of Physics-Based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification, Chair(s): Yang Wang		
Keynote presentation: Using Physics-Based Models and Machine Learning to Estimate Pressure on a Ship Hull <i>Patrick Brewick*</i>		Digital Twinning for Offshore Wind Turbine Drivetrain Using Bayesian Model Updating Method <i>Mohammad Valikhani*, Vahid Jahangiri, Hamed Ebrahimiyan, Sauro Liberatore, Babak Moaveni, Eric Hines</i>	Data-Driven Nonlinear Modal Analysis with a Physics-Integrated Deep Learning Approach <i>Shanwu Li*, Yongchao Yang</i>	Finite Element Model Updating of Maritime Infrastructure Based on Gaussian Process Regression of Point Cloud Data <i>David Lattanzi*, Ken Nahshon, William Graves</i>

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Eleni Chatzi		
Data-Driven Identification and Modeling of Nonlinear Dynamical Systems with a Physics-Integrated Deep Learning Approach: Koopman Operators and Nonlinear Normal Modes <i>Abdolvahhab Rostamijavanani*, Yongchao Yang</i>	Expert Knowledge Informed Bayesian Networks for Weld Condition Monitoring <i>Cyprien Hoelzl*, Vasilis Dertimanis, Eleni Chatzi</i>	PIDynNet: An ODE-Constrained Neural Network for Nonlinear Structural System Identification <i>Tong Liu*, Hadi Meidani</i>	Gaussian Process Regression with Bayesian Optimization for Mapping Between Modal Parameters and Environmental and Operational Variations <i>Doyun Hwang*, Sunjoong Kim, Ho-Kyung Kim</i>	An Observability Inspired Joint State, Parameter and Input Estimation Extended Kalman Filter <i>Manolis Chatzis*, Kristof Maes, Geert Lombaert</i>
Shaffer 2	#M303	Smart Sensor Networks for Civil Infrastructure Monitoring, Chair(s): Jian Li		
Autonomous Ultrasonic Thickness Measurement of Steel Bridge Members Using a Mobile Robot and the Martlet Wireless Sensing <i>Yu Otsuki*, Son Nguyen, Hung La, Yang Wang</i>	UAV-Deployable Vibration Sensing Nodes <i>Joud Satme*, Corinne Smith, Austin Downey, Nikos Vitzilaios, Rizos Dimitris</i>	An Active Noise Cancellation Method for Ultrasonic Signals on Metal Cylindrical Containers <i>Bozhou Zhuang, Bora Gencturk*, Iman Asareh, Assad Oberai, Ryan Meyer</i>	Dynamic Point Clouds-Based Structural System Identification Using a Multi-Channel Lidar <i>Jaehun Lee, Robin Eunju Kim*</i>	Vision-Based Measurements for Dynamic Evaluation of Structures <i>Sajjad Safari*, Shaymaa Obayes, Wael Aloqaily, Monique Head</i>
Hodson 313	#M312	Structural Instabilities: From Failure to Function, Chair(s): Hayder Rasheed		
Investigation of the Compressive Response and Failure of Novel Nano-Reinforced Epoxy Foaming Systems <i>Katerina Loizou, Katerina Sofokleous, Orestes Marangos, Stylianos Yiatros*, Vassilis M. Drakonakis</i>	Geometric Influence on the Bending Stability of Thin-Walled Corrugated Tubes <i>Zhongyuan Wo*, Evgueni Filipov</i>	Lateral-Torsional Buckling of Thin-Walled Anisotropic Laminated Composite I-Beam Under Pure Bending <i>Abdul Halim Halim*, Hayder Rasheed</i>	Vibration of Two-Layer Laminated Glass Plates with Initial In-Plane Loads <i>Viviane Setti Barroso*, Anísio Andrade, Noël Challamel, Paulo Providência</i>	

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): Yakov Zelickman		
<p>Keynote presentation: Multi-Objective Topology Optimization of Structural Battery Electrolyte</p> <p><i>Pejman Reza, Ahmad Najafi*</i></p>		<p>Topology Optimization of Thermofluidic Components</p> <p><i>Ardalan Nejat*, Jun Wang, Mark Fuge, James Guest</i></p>	<p>One-Shot Methods for Topology Optimization of Flow Problems</p> <p><i>Bruno Barroca*, Maarten Blommaert, Mattias Schevenels, Martine Baelmans</i></p>	<p>Topology Optimization of Conformal Thermal Control Structures on Free-Form Surfaces: A Dimension Reduction Level Set Method (DR-LSM)</p> <p><i>Xiaoqiang Xu*, David Gu, Shikui Chen</i></p>
Hodson 316	#M402	Geometries & Design: Opportunities for Sustainable Construction, Chair(s): Ann. C. Sychterz		
<p>Damage Detection of Cable-Actuated Origami Structure Using Dynamic Relaxation</p> <p><i>Angshuman C. Baruah*, Ann C. Sychterz</i></p>	<p>Enhanced Redundancy of Steel Truss Bridges Through Modular Joints</p> <p><i>Mirela Tumbeva, Ashley Thrall*, Theodore Zoli</i></p>	<p>A Contribution to Lowering Concrete-Related Emissions: Realization of Mass-Optimized Concrete Girders</p> <p><i>Nadine Stoiber*, Benjamin Kromoser</i></p>	<p>Design Optimization of Hybrid Steel/Timber Structures for Minimal Environmental Impact and Financial Cost: A Case Study</p> <p><i>Daan Van Cauteren*, Delphine Ramon, Jorben Stroeckx, Karen Allacker, Mattias Schevenels</i></p>	<p>Innovative Multi-Directional Falling Weight Deflectometer (FWD) Tests and Evaluation Based on a Distribution of the Effective Modulus of Subgrade Reaction</p> <p><i>Rodrigo Díaz Flores*, Mehdi Aminbaghai, Lukas Eberhardsteiner, Ronald Blab, Martin Buchta, Bernhard L.A. Pichler</i></p>
Krieger 308	#M404	Probabilistic Learning, Stochastic Optimization, and Digital Twins, Chair(s): Amir H Gandomi		
<p>Probabilistic Digital Twin for Component Stress-Aware Rotorcraft Control</p> <p><i>William Sisson*, Pranav Karve, Sankaran Mahadevan</i></p>	<p>Probabilistic Digital Twin for Additive Manufacturing</p> <p><i>Paromita Nath, Sankaran Mahadevan*</i></p>	<p>Probability-Based Seismic Hydraulic Performance Evaluation for Water Distribution Systems</p> <p><i>Weinan Li*, Ram Mazumder, Yue Li</i></p>		

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Shaffer 100	#M406	Probabilistic Assessment, Inference, and Optimization Under Uncertainty, Chair(s): Charalampos Andriotis		
Reliability-Based Topology Optimization Using a Virtual Element Method <i>Junho Chun*</i>	Structural Optimization Through a Markov Decision Process and Deep Reinforcement Learning Framework <i>Maximilian Ororbia*, Gordon Warn</i>	An Efficient and Accurate Point Estimate Method for Probabilistic Moments Evaluation <i>Minhyeok Ko*, Konstantinos Papakonstantinou</i>	Acceleration of Basis Adaptation Method for High-Dimensional Uncertainty Quantification Problems <i>Xiaoshu Zeng*, Roger Ghanem</i>	
Krieger 302	#M501	Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (FSI): Method Development and Applications, Chair(s): Georgios Moutsanidis		
Keynote presentation: 1-D and 3-D Computational Fluid Dynamics Model Comparison of the Treatment Performance of a Full-Scale Oxidation Ditch <i>Kiesha Pierre, Andres Tejada-Martinez*</i>		High-Order Implicit Shock Tracking for High-Speed Flows <i>Matthew Zahr*, Tianci Huang, Charles Naudet</i>	Solution of Bimaterial Riemann Problems in Compressible Multiphase Flow and Fluid-Structure Interaction Simulations <i>Wentao Ma*, Xuning Zhao, Shafquat Islam, Aditya Narkhede, Kevin Wang</i>	Mesh Convergence Study for Fluid-Structure Interaction Problems Using Non-Boundary-Fitted Meshing Techniques <i>Chen Shen*, Scott Miller, Jesse Thomas, Lucy Zhang</i>
Shaffer 202	#M603	Innovations and Advances in Passive, Active, and Semi-Active Structural Control, Chair(s): P. Scott Harvey		
A Bio-Inspired Quadrilateral Shape (BIQS) Isolation Systems for Vibration Reduction of In-Orbit Captures <i>A. Rose Thomas*, P. Scott Harvey</i>	Mechanical Characterization of Seismic Isolators Prototypes with Recycled Rubber <i>Melissa Herazo, Andrés Alvarez, Albert Ortiz, Luis Felipe Guerrero*</i>	Vibration Mitigation Using an Inerter-Based Isolation System <i>S. Sima Abolghasemi*, Nicholas Wierschem, J. Brent Knight</i>	Semi-Active Control for Seismic Protection of Buildings Using Magnetorheological Dampers with Control-Structure Interaction Included <i>Chia-Ming Chang*, Chung-Chen Liu</i>	Robust Wireless Structural Control Considering Actuation Signal Loss <i>Thao Truong, Peter Seiler, Lauren Linderman*</i>

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 303	#M607	Developments in Performance-Based Structural Fire Engineering, Chair(s): Serdar Selamet		
Performance-Based Structural Fire Design and Constructability of Tall Concrete-Filled HSS Columns <i>Jenny Sideri*, Pierre Ghisbain, Luciana Balsamo, Ali Ashrafi</i>	Performance-Based Structural Fire Design of a Prototype Metal Building <i>Xia Yan*, Thomas Gernay</i>	Finite-Element Modeling of Timber-Concrete Composite Floors in Fire <i>Julie Liu*, Erica Fischer</i>	Fire Resilience of Steel-Concrete Composite Floor Systems: Experimental Evaluation <i>Selvarajah Ramesh*</i>	Pore Pressure and Spalling Behavior of Loaded Concrete Under Elevated Temperatures <i>Chao Jiang, Yu-Qing Ge*, Hao-Chuan Zhang, Xiang-Lin Gu</i>
Krieger 304	#M611	Recent Advances in Experimental and Computational Wind Engineering, Chair(s): Aly Mousaad Aly / R. Panneer Selvam		
Simplified Procedure for Estimating the Wind Load Coefficients of Telecommunication Towers and Microwave Antenna <i>Mohanad Khazaali*, Liyang Ma, Keivan Rokneddin, Matteo Mazzotti, Paolo Bocchini</i>	Large-Scale Open-Jet Testing: A New Frontier in Structural Wind Engineering <i>Aly Mousaad Aly*, Md. Faiaz Khaled</i>	Performance of Various Inflow Turbulence Generation Methods for Wind Engineering Applications <i>Rathinam Selvam*, Zahra Mansouri, Arindam Chowdhury</i>	A Two-Step Deep Learning-Based Surrogate Model for Pressure on Low-Rise Buildings <i>Qiming Zhu*, Ze Zhao, Jinhui Yan</i>	
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Vedhus Hoskere / Fernando Moreu		
Measurements of the 3-Component (3C) Dynamic Displacements of Full-Scale Structures Using an Unmanned Aerial System (UAS) <i>Brandon Perry*, Yanlin Guo, Rebecca A. Atadero</i>	Robust Output-Only Modal Identification with Unsupervised Learning of Full-Field, High-Spatial-Dimensional Video Measurements <i>Yongchao Yang*, Charles Dorn</i>	Full-Scale Deformation Field Measurements of a Highway Bridge via Photogrammetric Remote Sensing <i>Kiyarash Aminfar*, William Graves, David Lattanzi</i>	A Comparison Between Three Vision-Based Displacement Measurement Methods in Lab-Scale Structural Experiments <i>Mehrdad Ghyabi*, David Lattanzi</i>	Evaluation of Event-Based Camera for Structural Dynamic Measurement and Control <i>Odey Yousef*, Fernando Moreu</i>

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Hodson 216	#M708	2nd Mini Symposium on Machine Learning-Based Computational Modeling for Civil Engineering Applications, Chair(s): Alessandro Fascetti		
Machine Learning-Enabled Data-Driven Methods in Hierarchical Constitutive and Damage Modeling of Metals and Composites <i>Somnath Ghosh*, Shravan Kotha, George Weber, Xiaofan Zhang</i>	Machine-Learned Physics-Informed Constitutive Modeling for Path-Dependent Materials <i>Xiaolong He*, Jiun-Shyan Chen, Jonghyuk Baek, John McCartney</i>	An LSTM Model to Predict the Performance of Elements <i>Mao Cheng*, Tracy Becker</i>	Data- and Physics-Based Modeling of Backward Erosion Piping in Flood Protection Infrastructure <i>Alessandro Fascetti*</i>	
Krieger 306	#M709	Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications, Chair(s): Gaofeng Jia		
Physics-Constrained Gaussian Process Model Through Kernel Design for Prediction of Hydrodynamic Interactions Between Wave Energy Converters in an Array <i>Min Li*, Gaofeng Jia, Hussam Mahmoud, Yi-Hsiang Yu, Nathan Tom</i>	Adaptive Multi-Fidelity Gaussian Process Model for Efficient Bayesian Inference <i>Christopher Hurst*, Min Li, Xinfeng Gao, Gaofeng Jia</i>	A Cost-Aware and Sensitivity-Based Active Learning Algorithm for System Reliability <i>Pietro Parisi, Maliki Moustapha*, Stefano Marelli, Bruno Sudret</i>		
Shaffer 302	#M711	Recent Advances in Real-Time Hybrid Simulation, Chair(s): Richard Christenson		
Keynote presentation: Modeling of NHERI-UCSD Upgraded 6-DOF Large High-Performance Outdoor Shake Table <i>Chin-Ta Lai*, Joel Conte</i>		Experimental Validation of the Structural Resilience of a Semi-Actively Controlled Base Isolation System Using Real-Time Hybrid Simulation <i>Yunbyeong Chae*, Ramin Rabiee</i>	Thermomechanical Cyber-Physical Testing: Control Requirements <i>Herta Montoya*, Amin Maghareh, Shirley Dyke, Arturo Montoya</i>	

TS 5: THURSDAY AFTERNOON, JUNE 2

02:10 PM	02:30 PM	02:50 PM	03:10 PM	03:30 PM
Krieger 180	#M802	Computational Geomechanics 2022, Chair(s): Xiaoyu Song		
<p>SPH+FEM Analysis of Anchoring Capacity in Dry Silica Sand</p> <p><i>Haozhou He*, Andras Karsai, Bangyuan Liu, Frank Hammond, Daniel Goldman, Chloe Arson</i></p>	<p>A Homogenization-Based Constitutive Model for Unsaturated Clay Rocks with Saturation-Dependent Anisotropy</p> <p><i>Sabrina C.Y. Ip*, Ronaldo Borja</i></p>	<p>Seismic Response of Sheet-pile Walls Considering Variabilities in the Ground Motion and Backfill Soil Density</p> <p><i>Mohamed Elghoraiby*, Majid Manzari</i></p>	<p>Diagnostic Criteria to Identify Delayed Strain-Localization in Viscoplastic Geomaterial</p> <p><i>Dawei Xue*, Ghassan Shahin, Xilin Lu, Giuseppe Buscarera</i></p>	

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 211	#M201	Multiscale Behavior of Damage and Failure Mechanics, Chair(s): Leong Hien Poh		
Parametrically Upscaled Continuum Damage Mechanics Model for Titanium Alloys <i>Shravan Kotha*, Somnath Ghosh</i>	An Elasto-Plastic Damage Model for the Jellyroll with Nonlinear Mechanical Behavior <i>George Z. Voyiadjis, Edris Akbari*, Peter I. Kattan</i>	Multi-Scale Phase Field Approach for Modeling Fracture Behavior in Rubber-Like Materials <i>Prajwal Kammardi Arunachala*, Sina Abrari Vajari, Matthias Neuner, Christian Linder</i>		
Hodson 305	#M206	Waves in Elastic Metamaterials and Phononic Crystals, Chair(s): Bojan Guzina		
Inverse-Designed Nonlocal Scattering for Analog Computing <i>Heedong Goh*, Andrea Alu</i>	From d'Alembert to Bloch and Back: A semi-Analytical Solution of 1D Boundary Value Problems Governed by the Wave Equation in Periodic Media <i>Danial Panahandeh Shahraki*, Bojan Guzina</i>	Metamaterials with Independently Tunable Mass, Damping, and Stiffness <i>Vinod Ramakrishnan*, Michael Frazier</i>	Dispersion and Dissipation Behavior in a Pre-Strained Shape Memory Alloy Periodic Beam <i>Qianlong Zhang*, Hongfei Zhu, Fabio Semperlotti</i>	A Stability Condition for Perfectly-Matched-Layers in 2D Elastic Wave Propagation Simulations <i>Stijn Francois*, Heedong Goh, Loukas Kallivokas</i>
Hodson 301	#M212	The Link Between Composition, Structure, and Properties in Engineered and Natural Materials, Chair(s): Ali Morshedifard		
Mineralogical Compositions via Raman Imaging: From Granites to Clinkers <i>Krishna C. Polavaram, Nishant Garg*</i>	Understanding Structure-Creep Relationships in Colloidal Glasses: Insights from Molecular Dynamics Simulations and Machine Learning <i>Luis Ruiz Pestana*</i>	Thermo-Mechanical Characterization of Concentrated Complex Alloy Building Blocks Using Nanoindentation <i>Yanbo Wang*, Hayden Johnson, Pania Newell, Jay Tiley</i>	3-D Microstructural Modeling of Damage Propagation in Additively Manufactured Discontinuous Fiber-Reinforced Composites <i>Maryam Shakiba*, Reza Sepasdar</i>	

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Shaffer 300	#M215	Computational Methods and Applications for Solid and Structural Mechanics, Chair(s): Pinlei Chen		
Reduced-Order Modeling for Hyper-Velocity Impact on Thin Structures <i>Adnan Shahriar*, Seyed Arsalan Maljesi, Sterling Reynolds, Arturo Montoya</i>	A Multiscale Finite Element Modeling Framework for Aluminum-Polyester Composite Abradable Coating in Gas Turbine Engines <i>Jiahao Cheng*, Xiaohua Hu, Drew Lancaster, Xin Sun, William Joost</i>	A Multiscale Reduced Order Model for Polycrystalline Microstructure with Cracks <i>Damin Xia*, Caglar Oskay</i>	Adaptive Eigendeformation-Based Reduced-Order Homogenization Model for Composite Materials <i>Min Lin*, David Brandyberry, Xiang Zhang</i>	Nonlinear Material Design with Reduced-Order Modeling <i>David Brandyberry, Xiang Zhang*, Philippe Geubelle</i>
Latrobe 107	#M216	Quasibrittle Fracture of Heterogeneous Composites: Modeling and Characterization, Chair(s): Marco Salviato		
Cylindrical Microplane Model for Compressive Kink Band Failures and Size Effect in Fiber Composites <i>Kedar Kirane*, Jing Xue</i>	A Novel Discrete, Mesoscale Modeling Framework for the Simulation of the Damaging and Fracturing Behavior of Composites <i>Marco Salviato*, Sean Phenisee, Antonio A. Deleo, Daniele Pelesson, Mark Flores</i>	A Viscoplastic Damage Model Based on Kinetics of Dislocation, Twinning, and Micro-Cracking for Quasi-Brittle Polycrystalline Beryllium Under Dynamic Loading Conditions <i>Nitin Daphalapurkar*, Daniele Versino, Darby Luscher</i>	Effect of Partitioning Geometry on Inhomogeneous and Anisotropic Apparent Properties of Statistical Volume Elements <i>Katherine Acton*, Reza Abedi, Justin Garrard</i>	Friction Modified Size Effect Law and Analysis for the Transverse Compressive Failure of Fiber Composites <i>Jing Xue*, Kedar Kirane</i>
Hodson 210	#M223	Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications, Chair(s): Xiaolong He		
Innovative Straight Formulation for Plate, Shaped with Re-Entrant Angles, in Bending <i>Antonina Pirrotta*, Carsten Proppe</i>	A Meshfree Peridynamic Model for Brittle Fracture in Randomly Heterogeneous Materials <i>Yue Yu*, Yiming Fan, Huaqian You, Xiaochuan Tian, Xiu Yang, Xingjie Li, Naveen Prakash</i>	Weak Enforcement of Essential Boundary Conditions Using the Variational Multiscale Method <i>Andrew Groeneveld*, Michael Hillman</i>		

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Shaffer 304	#M225	Integration of Physics-Based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification, Chair(s): Yang Wang		
<p>Bayesian Model Updating of Spent Nuclear Fuel Assemblies with Experimental Data Considering Uncertainties in the Modeling and Experiments</p> <p><i>Mehrdad Aghagholizadeh, Bora Gencturk*, Roger Ghanem, Anna Arcaro, Nidhi Thanki</i></p>	<p>Application of Bayesian Model Updating Technique for Bridge Structures and Structural Components Using Experimental Field Test Data</p> <p><i>Niloofer Malekghaini*, Farid Ghahari, Harsh Nandan, Ertugrul Taciroglu, Matthew Bowers</i></p>	<p>Stochastic Reduction and Efficient Bayesian Analysis for High-Dimensional Parameter Space and High-Dimensional Quantity of Interest Problems</p> <p><i>Xiaoshu Zeng*, Roger Ghanem, Bora Gencturk, Olivier Ezvan</i></p>	<p>Turning Telecommunication Cables into Distributed Acoustic Sensors for Bridge Health Monitoring</p> <p><i>Jingxiao Liu*, Siyuan Yuan, Bin Luo, Biondo Biondi, Hae Young Noh</i></p>	<p>Model Updating, Condition Assessment, and Maintenance of Multi-Component Systems Under Correlated Deterioration Processes</p> <p><i>Pablo G. Morato*, Charalampos P. Andriotis, Konstantinos G. Papakonstantinou, Philippe Rigo</i></p>
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Manolis Chatzis		
<p>Data-Driven Reduced-Order Modeling and Response Reconstruction through A Bayesian Expectation-Maximization (BEM) Framework</p> <p><i>Daniz Teymouri*, Omid Sedehi, Costas Papadimitriou, Lambros s. Katafygiotis</i></p>	<p>Time-Varying Shear-Wave Velocities in a High-Rise During the 2019 M7.1 and M6.4 Ridgecrest Earthquakes from Wavefield Interferometry</p> <p><i>Monica Kohler*, German Prieto</i></p>	<p>Multiscale Condition Assessment of Concrete Plates Using Impulse-Response Test</p> <p><i>Sikandar Sajid, Luc Chouinard, Hizb Ullah Sajid*</i></p>	<p>An Approach for Optimal Sequential Sensor Placement Under Steady-State Dynamics</p> <p><i>Mark Chen*, Kavinayan Sivakumar, Gregory Banyay, Jessica Preston, Brian Golchert, Timothy Walsh, Michael Zavlanos, Wilkins Aquino</i></p>	
Hodson 313	#M312	Structural Instabilities: From Failure to Function, Chair(s): Hayder Rasheed / M. Ahmer Wadee		
<p>Keynote presentation: Harnessing the Nonlinear Behavior of a Laterally Loaded Arch for Vertical Vibration Isolation</p> <p><i>Stone Brackett, Santiago Navarro Garcia, P. Scott Harvey*</i></p>	<p>Imperfection Analysis of In-Situ 3D Measurements of Stainless Steel Unequal-Leg Angles for Computational Modeling</p> <p><i>Edward Sippel*, Hannah Blum</i></p>	<p>Buckling of a Confined Steel Shells Subjected to a Solid/Solid External Loading - Experimental Approach and Simulation</p> <p><i>Mohamad Jrad*, Ali Limam, Norman Mathieu, Frederic Bumbieler, Hamid Zahrouni, Mahdia Hattab</i></p>	<p>Benchmark Tests on Cylindrical Shells Under Combined Bending and Torsion</p> <p><i>Victoria Ding*, Xiang Yun, Ben Schafer, Shahab Torabian</i></p>	

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): Oded Amir		
<p>Topology and Shape Optimization Based on the Shifted Boundary Method</p> <p><i>Boyan Lazarov*, Nabil Atallah, Guglielmo Scovazzi, Vladimir Tomov</i></p>	<p>Optimization of Concrete Plate Thicknesses Using a Feature Mapping Approach</p> <p><i>Yakov Zelickman*, James Guest, Oded Amir</i></p>	<p>Topology Optimization of Steel Fiber-Reinforced Concrete Ribbed Floors with a Predefined Load-Bearing Capacity</p> <p><i>Tobias Barbier*, Geert Lombaert, Mattias Schevenels</i></p>	<p>Improving the Buckling Performance of Topology-Optimized Structures for Everyday Design</p> <p><i>Dat Ha*, Josephine Carstensen</i></p>	
Hodson 316	#M402	Geometries & Design: Opportunities for Sustainable Construction, Chair(s): Agathe Robisson		
<p>UHPC Made with Recycled UHPC and Optimized with AI – an Infinite Reusability?</p> <p><i>Valdrin Maliki, Dana Daneshvar, Teresa Liberto, Gabriel Reiter, Hermann Schichl, Johannes Kirnbauer*, Agathe Robisson, Waltraud Stoellinger</i></p>	<p>Robustness of Multilayered Random-Network Architected Material Through Experimental Testing</p> <p><i>Sagnik Paul*, Ann C. Sychterz</i></p>	<p>Sustainability Potential of Tailored FRP-Reinforced Concrete Structures Through Optimized Design and Robotic Fabrication</p> <p><i>Philipp Preinstorfer*, Robin Oval, Mishael Nuh</i></p>	<p>Environmental Application Potential of FRP-Reinforcement in Concrete Infrastructure Engineering: LCA Data and Two Application Examples</p> <p><i>Sara Reichenbach*, Philipp Preinstorfer, Nadine Stoiber, Tobias Huber, Benjamin Kromoser</i></p>	<p>Studying the Impact of Aging on Dynamic Response of Concrete</p> <p><i>Sannidhya Ghosh*, Petros Sideris, Mija Hubler</i></p>
Shaffer 100	#M406	Probabilistic Assessment, Inference, and Optimization Under Uncertainty, Chair(s): George Deodatis		
<p>Probabilistic Performance Assessment of Tunneling-Induced Structural Damage</p> <p><i>Jinyan Zhao*, Matthew DeJong</i></p>	<p>Assessing Uncertainty in Climate Forecasting with Physical-Based Probabilistic State-Space Models</p> <p><i>Yuchuan Lai*, Peter Adams, Matteo Pozzi</i></p>	<p>Random Field Calibration with Data on Irregular Grid for Regional Analyses</p> <p><i>Sena Mursel*, Daniel Conus, Wei-Min Huang, Javier Buceta, Paolo Bocchini</i></p>	<p>Post-Hurricane Loss Assessment Using Crowdsourcing: A Probabilistic Approach</p> <p><i>Asim Bashir Khajwal*, Arash Noshadravan</i></p>	

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Krieger 302	#M501	Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (FSI): Method Development and Applications, Chair(s): Jinhui Yan		
An Explicit Weighted Shifted Boundary Method for Euler Equations in Deforming Domains <i>Xianyi Zeng*, Guglielmo Scovazzi</i>	Deep Reinforcement Learning for Fish Fin Ray Control <i>Xin-yang Liu, Dariush Bodaghi, Qian Xue, Xudong Zheng, Jian-xun Wang*</i>	Particle Damping of Floating Oscillating Surge Wave Energy Converters <i>Ahmed Shalaby*, Alaa Ahmed, Raju Datla, Muhammad Hajj, Sami Masri, Jia Mi, Lei Zuo</i>	Computational Fluid Dynamics with Multiphysics Applied on Removal of Charged Particles by Electrophoresis in a Fluid Environment <i>Kun Gou*, Walter Deng</i>	Non-Intrusive Coupling of Multi-Physics Codes for Eulerian-Lagrangian Solid-Solid Interaction Using Immersed Finite Element Method <i>Narendra Nanal*, Lucy Zhang, Mark Christon, David Hensinger</i>
Krieger 300	#M502	Advances of Fluid Dynamics in Modelling and Simulation, Chair(s): Gabriella Bogнар		
Heat Transfer Enhancement for Nanofluid Flows over a Microscale Backward-Facing Step <i>Gabriella Bogнар*</i>	State-Space Representation of Radiation Damping of an Oscillating Surge Wave Energy Converter <i>Alaa Ahmed*, Muhammad Hajj, Raju Datla, Jia Mi, Lei Zuo</i>	Influence of Lateral Surface Vibrations on Drop Contact Line Dynamics: A Numerical Study <i>Vishal Sivasankar*, Siddhartha Das, Balakumar Balachandran</i>		
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Vedhus Hoskere / Mohammad Jahanshahi		
Machine Learning for Pre-Hurricane Damage Prediction of Structures <i>Samuel Leach*, Stephanie Paal</i>	Hybrid Crowd-AI Framework to Reduce Uncertainty in Automated Post-Disaster Damage Assessment <i>Chih-Shen Cheng*, Amir Behzadan, Arash Noshadravan</i>	Toward Crowdsourcing-Based Condition Assessment of Roads Using Deep Learning and Data Fusion <i>Yu-ting Huang*, Fangjia Shen, Taratal Ghosh Mondal, Mohammad Reza Jahanshahi</i>	Machine-Aided Bridge Deck Condition Evaluation Analysis <i>Xin Zhang*, Benjamin Wogen, Shirley Dyke, Julio Ramirez, Randall Poston, Xiaoyu Liu, Lissette Iturburu</i>	Quality Control of Low-Cost Nitrate Sensors Using a Scalable and Resource-Efficient Artificial Intelligence Based Approach <i>Rih-teng Wu*, Ye Mi, Xihui Wang, Sotoudeh Sedaghat, Kerry Maize, Nicholas Glassmaker, Mohammad Jahanshahi, Rahim Rahimi, Ali Shakouri, Jan Allebach, Elisa Bertino</i>

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Krieger 306	#M704	Advances in Machine Learning and Surrogate Modeling for Probabilistic Analysis and Optimal Operation, Control, and Planning of Infrastructure Systems, Chair(s): Negin Alemazkoor		
Guided Post-Earthquake Reconnaissance Considering Resource Constraints for Regional Damage Inference	A Live Load Model for Bridge Condition Assessment Based on Traffic Simulations and Influence Lines	Dynamic Deep Learning-Based Power Restoration in Distribution Systems		
<i>Ge Ou*, Mohamadreza Sheibani</i>	<i>Jihwan Kim*, Junho Song</i>	<i>Ashkan Bagheri Jeddi*, Abdollah Shafieezadeh</i>		
Hodson 315	#M705	Advances in Deep Learning-Based Infrastructure Assessment, Chair(s): Eleni Chatzi		
Generative Deep Learning for Optimal Sensor Placement	Structured Differentiable Extended Kalman Filters for Learning Nonlinear Dynamics	Predicting Visual Deterioration in Bridge Decks from NDE Data Through Generative Models	Automating the Classification of Seismically Vulnerable Concrete Buildings	
<i>Seyedomid Sajedi, Xiao Liang*</i>	<i>Wei Liu*, Zhilu Lai, Eleni Chatzi</i>	<i>Amirali Najafi*, John Braley, Ali Maher</i>	<i>Lisette Iturburu*, Jean Kwannandar, Shirley Dyke, Julio Ramirez, Xin Zhang</i>	
Krieger 304	#M706	AI Applications for Wind Engineering, Chair(s): Fei Ding		
Double-Layer Machine Learning Framework for Cooperative Wind Farm Control	Identifying Building Attributes that Influence Hurricane Damage by Using Dimensionality Reduction Techniques	A Layout Optimization Framework of Large-Scale Wind Farms Based on Machine Learning	Machine Learning-Enabled Estimation of Crosswind Load Effect on Tall Buildings	Machine Learning Based Reduced Order Modeling of Hydrodynamics Forces for Flow Over Oscillating Airfoil
<i>Shanghai Yang*, Xiaowei Deng</i>	<i>Saanchi Singh Kaushal*, Mariantonieta Gutierrez Soto, Rebecca Napolitano</i>	<i>Kun Yang*, Xiaowei Deng</i>	<i>Pengfei Lin*, Gang Hu, Fei Ding, Chao Li, Yiqing Xiao, Kam Tim Tse, Kenny Kwok, Ahsan Kareem</i>	<i>Nida Ahsan*, Muhammad R. Hajj, Imran Akhtar, Hamayun Farooq, Ahmad Saeed, Mahmoud Ayyad</i>

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Hodson 216	#M708	2nd Mini Symposium on Machine Learning-Based Computational Modeling for Civil Engineering Applications, Chair(s): Alessandro Fascetti		
Seismic Fragility Estimates of RC Columns via Sequence-Based Deep Learning Using LSTM and GRU neural networks <i>Do-Eun Choe*</i>	Smart Adaptive Mesh Refinement for Finite Element Simulation of Dynamic Problems <i>Fereshteh A Sabet*, Alessandro Gondolo, Akash Patel</i>	Gaussian Process Subspace Prediction for Parametric Studies of Structural Systems <i>Ruda Zhang*</i>		
Shaffer 302	#M711	Recent Advances in Real-Time Hybrid Simulation, Chair(s): Wei Song		
Virtual Distributed Real-Time Hybrid Simulation for Floating Wind Turbine Under the Coupled Wind and Wave Loads <i>Hezha Sadraddin*, Bilal Alhawamdeh, Xiaoyun Shao</i>	Assessment of Offshore Wind Turbine Piled Foundation Behavior Using Hybrid Simulation <i>Safwan Al-Subaihawi*, Qasim Abu-Kassab, Sudharsan Kalidoss, James Ricles, Muhannad Suleiman, Richard Sause, Arindam Banerjee, Justin Jaworski, Kevin Wyckoff, Liam Magargal, Tommy Marullo</i>	A Real-Time Hybrid Simulation Framework for Floating Offshore Wind Turbines <i>Chao Sun*, Wei Song, Vahid Jahangiri</i>	Studying Fluid-Structure Interactions via Real-Time Hybrid Experimental-Numerical Simulation <i>Akiri Seki*, Barbara Simpson, Christopher Neumann, Andreas Schellenberg, Pedro Lomonaco</i>	Rapid Evaluation of Vibration Mitigation Devices for Transportation Infrastructure Using Real-Time Hybrid Simulation <i>Pablo Agüero-Barrantes, Richard Christenson*</i>
Shaffer 202	#M713	Assessing Human-Infrastructure Interactions and their Performance, Chair(s): Fernando Moreu / Yiwen Dong		
Analysis of Eye Tracking Metrics for Facade Inspection to Understand Human-Infrastructure Interactions in Built Environment <i>Muhammad Rakeh Saleem*, Rebecca Napolitano</i>	Using Resonance to Mechanically Amplify Floor Vibrations <i>Melanie McCloy*, Zoe Haynes, Zhaoshuo Jiang, Juan Caicedo</i>	Respiration Monitoring Using a Motion Tape Chest Band <i>Yun-An Lin, Emerson Noble, Taylor Pierce, Chin-Hsiung Loh, Kenneth Loh*</i>	Augmented Reality for Feedback and Control in Vibratory Experimentation <i>Elijah Wyckoff*, Fernando Moreu, Marlan Ball</i>	

TS 6: THURSDAY EVENING, JUNE 2

04:20 PM	04:40 PM	05:00 PM	05:20 PM	05:40 PM
Krieger 180	#M802	Computational Geomechanics 2022, Chair(s): Xiaoyu Song		
<p>Machine Learning-Enabled Contact Detection and Resolution of Irregular-Shaped Particles in Discrete Element Method</p> <p><i>Zhengshou Lai, Qiushi Chen*, Linchong Huang</i></p>	<p>Numerical Modeling of Phase Transformation Induced Material Fracture and Crack Propagation</p> <p><i>FNU Sindhusuta, Sheng-Wei Chi*, Craig Foster</i></p>	<p>Machine Learning Enabled Offline Multiscale Aggregating Discontinuity Method for Elastoplastic Composites Undergoing Strain Localization</p> <p><i>Mian Xiao*, Nikolaos Vlassis, WaiChing Sun</i></p>		
Hodson 303	#M804	Chemo-Mechanics of Asphalt Materials: Experimental Characterization and Numerical Modeling, Chair(s): Ramez M. Hajj		
<p>On the Use of Principal Component Analysis for ATR-FTIR Spectra, Obtained from Bitumen During Oxidation as a Tool for Differentiate Asphalt Binders</p> <p><i>Michalina Makowska, Augusto Cannone Falchetto*, Mika Köngäs, Leena Korkiala-Tanttu</i></p>	<p>Coarse Grained Modeling of Nanostructure and Asphaltene Aggregation in Asphalt Binder Using Dissipative Particle Dynamics</p> <p><i>Jin Tang*, Hao Wang</i></p>	<p>A Data-Driven Model for Master Curves of Viscoelastic Materials</p> <p><i>Babak Asadi*, Ramez Hajj</i></p>	<p>Molecular Interaction of Asphalt-Aggregate Interface Modified by Silane Coupling Agents at Dry and Wet Conditions</p> <p><i>Bingyan Cui*</i></p>	<p>Synthesis of Asphalt Binder Nanostructures Via Generative Adversarial Networks</p> <p><i>Mohammad Aljarrah*, Ayman Karaki, Eyad Masad</i></p>

Parallel Technical Sessions

Friday, June 3

TS 7: FRIDAY MORNING, JUNE 3

11:00 AM	11:20 AM	11:40 AM	12:00 PM	12:20 PM
Hodson 301	#M212	The Link Between Composition, Structure, and Properties in Engineered and Natural Materials, Chair(s): Michael Sacks		
<p>Biomolecule-Microstructure-Property Relationships Towards Rational Design of Admixtures in Cementitious Materials</p> <p><i>Sadegh Tale Masouleh, Elvis Baffoe, Ali Ghahremaninezhad*</i></p>	<p>A Multi-Scale Computational Model of Ventricular Myocardium</p> <p><i>David Li, Emilio Mendiola, Reza Avazmohammadi, Frank Sachse, Michael Sacks*</i></p>			
Shaffer 300	#M215	Computational Methods and Applications for Solid and Structural Mechanics, Chair(s): Ravindra Duddu		
<p>Effect of Boundary Condition and Statistical Volume Element Size on Inhomogeneity and Anisotropy of Apparent Properties</p> <p><i>Reza Abedi*, Justin Garrard, Ming Yang, Pengfei Zhang, Katherine Acton, Soheil Soghrati</i></p>	<p>Modeling Multiblock Systems: Computational Analyses Backed by Experiments</p> <p><i>Jose Andrade, Ares Rosakis, Joel Conte, Jose Restrepo, Vahe Gabuchian, John Harmon, Andres Rodriguez, Arpit Nema, Andrea Pedretti, Ziran Zhou*, Luca Sironi, Marco Andreini, Filippo Dacarro, Davide Bolognini</i></p>	<p>Experimental and Numerical Analysis of an Additively Manufactured Ti-6Al-4V Panel Subjected to Blast Loading</p> <p><i>Gillian Schiffer*, Brandon Escamilla, Cole Chappell, Kevin McMullen, Benjamin Simonson</i></p>	<p>Nonlinear Lattices Violating a Thermodynamic Law</p> <p><i>Bart Boom*, Ed Habtour</i></p>	
Hodson 305	#M223	Meshfree, Peridynamics, and Particle Methods: Contemporary Methods and Applications, Chair(s): Sheng-Wei Chi		
<p>Peridynamics Computations at the Exascale</p> <p><i>Pablo Seleson*, Sam Reeve</i></p>	<p>A Stochastic Lattice Discrete Particle Modeling Approach for Fracture Simulations in Porous Media</p> <p><i>Alessandro Fascetti*, John E. Bolander</i></p>	<p>Solver Selection and Complexity Analysis for the Meshfree Methods</p> <p><i>Yanran Wang*, Michael Hillman</i></p>	<p>Solving Boundary Value Problems by Strong and Weak Form Methods Using Reproducing Kernel Peridynamics</p> <p><i>Feihong Liu*, Michael Hillman</i></p>	

TS 7: FRIDAY MORNING, JUNE 3

11:00 AM	11:20 AM	11:40 AM	12:00 PM	12:20 PM
Shaffer 304	#M225	Integration of Physics-Based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification, Chair(s): Hamed Ebrahimian		
Data-Driven Inverse Characterization for In-Situ Microscopic Composite Properties <i>Zimu Su*, Caglar Oskay</i>	Physics-Informed Data-Driven Prediction of Normal Strain Field in Concrete Structures <i>Mauricio Pereira*, Branko Glisic</i>	Physics-Based and Data-Driven Portfolio Fragility Curves for Telecommunication Towers Under Hurricanes <i>Mohanad Khazaali*, Paolo Bocchini</i>	Estimating Physical Parameters of Linear Dynamic Systems in the Presence of Model Form Uncertainty <i>Mukesh Ramancha*, Joel Conte, Matthew Parno</i>	
Shaffer 301	#M301	Structural Identification and Damage Detection, Chair(s): Tzuyang Yu		
Comparative Study of Optimal Sensor Placement Methods for Structural Health Monitoring of a Hybrid CLT-Steel Building <i>David Caballero-Russi*, Alejandro Palacio-Betancur, Mariantonieta Gutierrez Soto</i>	Interpreting Ground Penetrating Radar Scans with Semi-Supervised Learning for Building Pathology and Diagnostics <i>Ahmed Nirjhar Alam*, Wesley Reinhart, Rebecca Napolitano</i>	Subsurface Void Detection of Subgrade Around Culverts with Dual-Frequency Ground Penetrating Radar (GPR) <i>Koosha Raisi*, Nimun Nak Khun, Aiyad Alshimaysawee, Tzuyang Yu</i>	Artificial Crack Depth Determination of Concrete Specimens Using Ground Penetrating Radar and Synthetic Aperture Radar Images <i>Tzuyang Yu*</i>	Damage Identification of a Spent Nuclear Fuel Canister Structure with an Accurate Multi-Level Nested Substructuring Model <i>Xiaoshu Zeng, Bora Gencturk*, Roger Ghanem, Olivier Ezvan</i>
Hodson 311	#M401	Topology Optimization: from Algorithmic Developments to Applications, Chair(s): James Guest		
On the Use of Proper Generalized Decomposition in the Context of Topology Optimization <i>Tomas Pauwels*, Mattias Schevenels</i>	Topology Optimization with Bilinear Elastic Material Models <i>Justin Unger*, Alberto Torres, Andrew Gaynor, Matthew Vaughn, Brandon McWilliams, Kevin Hemker, James Guest</i>	GA-Based Offshore Helideck Design with Unity Check <i>Seung-Hyun Ha*</i>	Topology Optimization of Additively Manufactured Fluidic Components Considering Overhang Constraints <i>Reza Behrou*, Kathryn Kirsch, Ram Ranjan, James K. Guest</i>	

TS 7: FRIDAY MORNING, JUNE 3

11:00 AM	11:20 AM	11:40 AM	12:00 PM	12:20 PM
Hodson 303	#M501	Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (FSI): Method Development and Applications, Chair(s): Georgios Moutsanidis		
Residual-Based Variational Multiscale Modeling with the Finite Volume Method <i>Anthony Perez*, Andres Tejada-Martinez</i>	Effects of Excitation Parameters and Material Flexibility on Performance of Fish Tails Forced by a Combination of Pitching and Heaving Motions <i>Hossam Aboalela*, Muhammad Hajj</i>	Fluid-Structure Interaction with ALE Formulation and Skeleton-Based Structural Models <i>Dimitrios Kalliontzis*</i>	An Enriched Immersed Boundary Method for Thermo-Fluid-Structure Systems with Large Property Discontinuities <i>Ze Zhao*, Jinhui Yan</i>	
Shaffer 303	#M701	Advances in Computer Vision, Deep Learning, and Artificial Intelligence for Structural Health Monitoring and Inspections, Chair(s): Vedhus Hoskere / Mohammad Jahanshahi		
Autonomous Subsurface Defect Detection in Concrete Bridges Using Impact Echo <i>Faezeh Jafari*, Sattar Dorafshan</i>	Detecting Delamination in Composites Using Planar Electrical Capacitance Tomography and Machine Learning <i>Yening Shu*, Xinlun Zhao, Kenneth Loh</i>	Inverse Analysis of Strain Distribution Sensed by Distributed Fiber Optic Sensor Subject to Strain Transfer <i>Soroush Mahjoubi*, Yi Bao</i>	A Hybrid MLP-CNN Model for Estimating Buckling Strength of Corroded Plates <i>Tao Zhang*, Arash Zaghi</i>	
Shaffer 302	#M704	Advances in Machine Learning and Surrogate Modeling for Probabilistic Analysis and Optimal Operation, Control, and Planning of Infrastructure Systems, Chair(s): Negin Alemazkoor		
Physics-Informed Neural Networks for Network Analysis and Reliability Assessment of Lifeline Infrastructures <i>Ji-Eun Byun*, Daniel Straub</i>	Bi-Fidelity Neural Network Operators for Uncertain Systems <i>Subhayan De*, Malik Hassanaly, Matthew Reynolds, Ryan King, Alireza Doostan</i>	A Multi-Fidelity Polynomial Chaos Greedy Kaczmarz Approach for t Uncertainty Quantification on Limited Budget <i>Negin Alemazkoor*, Mazdak Tootkaboni, Arghavan Louhghalam</i>	Application of Machine Learning Algorithms in Failure Risk Analysis of Pipelines <i>Ram Krishna Mazumder, Abdullahi Salman, Yue Li*</i>	

TS 7: FRIDAY MORNING, JUNE 3

11:00 AM	11:20 AM	11:40 AM	12:00 PM	12:20 PM
Hodson 315	#M705	Advances in Deep Learning-Based Infrastructure Assessment, Chair(s): Cyprien Hoelzl / Jingxiao Liu		
<p>Physics-Based Machine Learning for Probabilistic Damage Diagnosis in Concrete</p> <p><i>Sarah Miele*, Pranav Karve, Sankaran Mahadevan</i></p>	<p>Inspection of Cracks in Welded Joint Using Active Thermography and Deep Learning-Based Detection</p> <p><i>Chisung Kim*, Hoon Sohn</i></p>	<p>A Long Short-Term Memory-Based Algorithm for Seismic Response Prediction Using Structural and Material Parameters</p> <p><i>SangHoon Song*, Ali Tabish, Robin Enju Kim</i></p>	<p>Using Information Fusion and Image Classification to Automatically Classify Post-Event Building Damage State</p> <p><i>Xiaoyu Liu*, Lissette Iturburu, Shirley Dyke, Ali Lenjani, Julio Ramirez, Xin Zhang</i></p>	
Shaffer 202	#M713	Assessing Human-Infrastructure Interactions and their Performance, Chair(s): Fernando Moreu / Ann Lin		
<p>Variability Characterization in Footstep-Induced Structural Vibrations for Online Person Identification</p> <p><i>Yiwen Dong*, Hae Young Noh</i></p>	<p>Using Coarse Sensing Pressure Mat to Identify Human Activity</p> <p><i>Pressley Perry*, Anthony Washington*, Zhaoshuo Jiang, Juan Caicedo</i></p>			
Hodson 213	Special Panel: Mechanics Education at a Crossroad: Vision for Evolution and Regeneration, Chair(s): Roger Ghanem / Franz-Josef Ulm			
<p>This panel will initiate a conversation and propose actions, within the EMI community, towards a systematic revision of mechanics textbooks, curricula, and delivery mechanisms to reflect technological and scientific advances of our lifetime and our envisioned future.</p> <p>Panelists:</p> <ul style="list-style-type: none"> -Eleni Chatzi, <i>ETH Zürich</i> -Johann Guilleminot, <i>Duke University</i> -Chloe Arson, <i>Georgia Institute of Technology</i> -WaiChing Sun, <i>Columbia University</i> -Saurabh Amin, <i>Massachusetts Institute of Technology</i> -Mohammad Javad Abdohosseini Qomi, <i>University of California, Irvine</i> 				

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