

9TH INTERNATIONAL WORKSHOP ON RELIABLE ENGINEERING COMPUTING
Risk and Uncertainty in Engineering Computations
Virtual Conference: May 17-20, 2021

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PROGRAM

HONORARY CHAIR

Michael Beer, Leibniz University Hannover, Germany

CHAIRS

Giuseppe Muscolino, University of Messina, Italy
Alba Sofi, University "Mediterranea" of Reggio Calabria, Italy

FOUNDERS AND GENERAL CHAIRS

Rafi L. Muhanna, Georgia Institute of Technology, USA
Robert L. Mullen, University of South Carolina, USA

KEYNOTE SPEAKERS

Michael Beer, Leibniz University Hannover, Germany
Mario Di Paola, University of Palermo, Italy
David Moens, KU Leuven, Belgium



UNIVERSITY "MEDITERRANEA" OF
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[Part A: Civil Engineering](#)
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UNIVERSITY OF
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Bernoulli Society
for Mathematical Statistics
and Probability

MONDAY MAY 17TH, 2021

14:00	Opening Remarks
14:30	Session 1 , Chair: A. Sofi, University "Mediterranea" of Reggio Calabria (Italy)
	Keynote Lecture: Michael Beer <i>Efficient Uncertainty Quantification for Complex Engineering Systems</i>
15:30	Break
15:45-17:25	Session 2 , Chair: R. L. Muhanna, Georgia Institute of Technology (USA)
15:45	M. Desch , M. Modares <i>Uncertainty Analysis of Fatigue Failure Using an Interval Approach</i>
16:05	D. Betancourt , R. L. Muhanna <i>Deep Interval Neural Network in Computational Mechanics</i>
16:25	A. Gray , M. De Angelis, S. Ferson, E. Patelli <i>What's Z-X, when Z=X+Y? Dependency Tracking in Interval Arithmetic with Bivariate Sets</i>
16:45	M. De Angelis , M. Behrendt, L. Comerford, Y. Zhang, M. Beer <i>Forward Interval Propagation through the Discrete Fourier Transform</i>
17:05	R. R. P. Callens , M. G. R. Faes, D. Moens <i>Interval Analysis Using Multilevel Quasi-Monte Carlo</i>
17:25	Break
17:40-19:00	Session 3 , Chair: R. L. Mullen, University of South Carolina (USA)
17:40	S. Freitag , S. Peters, P. Edler, G. Meschke <i>Topology Optimization with Polymorphic Uncertainties using Artificial Neural Networks</i>
18:00	S. Shahi , R. L. Muhanna, F. Fedele <i>An Integrated Interval Neural Network for Uncertainty Modeling in Inhomogeneous Materials</i>
18:20	D. Betancourt , S. Freitag, R. L. Muhanna <i>Damage Detection for Structural Health Monitoring under Uncertainty using Deep Interval Neural Networks</i>
18:40	A. Schmidt , T. Lahmer <i>Numerical Simulation of a 3D Concrete Printing Process under Polymorphic Uncertainty</i>

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TUESDAY MAY 18TH, 2021

14:00	Session 4 , Chair: G. Muscolino, University of Messina (Italy)
	Keynote Lecture: Mario Di Paola <i>Path Integral Method for the Probability Distribution and Barrier Problems of Non-Linear Systems under White Noise Processes (Normal, Alpha Stable, Poissonian)</i>
15:00	G. Stefanou , D. Savvas, P. Metsis <i>Homogenization of 3D Concrete Microstructures Based on CT Image Reconstruction</i>
15:20	M. Faes , M. Broggi, P. D. Spanos, M. Beer <i>Elucidating Appealing Features of Differentiable Autocorrelation Functions: a Study on the Modified Exponential Kernel</i>
15:40	Break
15:55-17:35	Session 5 , Chair: S. Ferson, University of Liverpool (UK)
15:55	C. Proppe <i>Local Reliability Based Sensitivity Analysis with the Moving Particles Method</i>
16:15	U. Alibrandi , L. V. Andersen, E. Zio <i>Mutual Information for Global Sensitivity Analysis and Adaptive-Learning Surrogate Modelling</i>
16:35	D. J. Jerez , H. A. Jensen, M. A. Valdebenito, M. Misraji, M. Beer <i>An Efficient Approach for Reliability-Based Optimization of Linear Dynamical Structures subject to Gaussian Excitation</i>
16:55	M. A. Valdebenito , M. G. R. Faes <i>A Fully Decoupled Approach for a Class of Reliability-Based Optimization Problems in Stochastic Linear Dynamics</i>
17:15	M. Ciano , M. Giofrè, M. Grigoriu <i>Estimation of Fragilities by the Modified Intensity Measures (IMs)</i>
17:35	Break
17:50-19:10	Session 6 , Chair: M. A. Valdebenito, Adolfo Ibanez University (Chile)
17:50	M. IacuanIELLO , A. Montanino, D. De Gregorio, G. Zuccaro <i>Analyses of Resistance of Openings to Pyroclastic Flows</i>
18:10	A. Montanino , A. Franci, G. Zuccaro <i>Towards a Multiphase Finite Element Code for the Evaluation of Volcanic Risk</i>
18:30	E. Saleh , J. Mohammadi <i>Design Criteria for Temporary Structures in Uncertain Extreme Natural Hazard Load Environments</i>
18:50	F. Giunta , G. Muscolino, A. Sofi <i>Reliability Analysis of Randomly Excited Structures with Interval Stiffness Parameters via Sensitivity Analysis</i>

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WEDNESDAY MAY 19TH, 2021

14:00	Session 7 , Chair: M. Hanss, University of Stuttgart (Germany)
	Keynote Lecture: David Moens <i>Recent Advances in Interval Field Uncertainty Modelling for Large-scale Finite Element Models</i>
15:00	N. Gray, S. Ferson, V. Kreinovich <i>How to Gauge the Quality of a Testing Method when Ground Truth is Known with Uncertainty</i>
15:20	J. Karakašević, M. Oberguggenberger <i>Random Set Solutions to Partial Differential Equations</i>
15:40	Break
15:55-17:35	Session 8 , Chair: V. Kreinovich, University of Texas at El Paso (USA)
15:55	D. Hose , M. Hanss <i>On the Solution of Forward and Inverse Problems in Possibilistic Uncertainty Quantification for Dynamical Systems</i>
16:15	B. Jang , J. Mohammadi <i>A Bimodal Distribution Function with Fuzzy Regression for Predicting Truck Load Population Including Overloads</i>
16:35	S. Sessa , D. Pellicchia, N. Vaiana, L. Rosati <i>Sensitivity of an Hysteretic Material Model for Random Vibration Analysis of Base-Isolated Rigid-block Historical Artifacts</i>
16:55	R. Laudani , G. Falsone <i>An Evolutive Probability Transformation Method for the Dynamic Stochastic Analysis of Structures</i>
17:15	G. Marasco , B. Chiaia, G. Ventura <i>AI Based Bridge Health Assessment</i>
17:35	Break
17:50-19:10	Session 9 , Chair: M. Oberguggenberger, University of Innsbruck (Austria)
17:50	M. Daub , S. Marelli, B. Sudret <i>On Constrained Distribution-Free P-boxes and their Propagation</i>
18:10	M. G. R. Faes , M. Broggi, K.-K. Phoon, M. Beer <i>Distribution-Free P-box Processes: Definition and Simulation</i>
18:30	S. Ferson, A. Gray <i>Distribution-Free Uncertainty Propagation</i>
18:50	M. Beer, O. Kosheleva, V. Kreinovich <i>Fusion of Probabilistic Knowledge as Foundation for Sliced-Normal Approach</i>

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THURSDAY MAY 20TH, 2021

8:30-10:30	Session 10 , Chair: W. Gao, University of New South Wales (Australia)
8:30	K. Ozaki , T. Ogita, D. Mukunoki <i>Interval Matrix Multiplication Using Fast Low-Precision Arithmetic on GPU</i>
8:50	E. Auer , A. Ahrens <i>Guaranteed Minimization of the Bit Error Ratio for Correlated MIMO Systems</i>
9:10	M. Böttcher , W. Graf, M. Kaliske <i>Quantification of Data and Production Uncertainties for Tire Design Parameters</i>
9:30	R. Santoro, A. Sofi, F. Tubino <i>Serviceability Assessment of Footbridges via Interval Analysis</i>
9:50	Y. Yu , W. Gao, Q. Wang, B. Dong <i>Virtual Corrosion Initiation Monitoring for Infrastructures Considering Environmental Uncertainty</i>
10:10	Y. Q. Huang , D. H. Luo <i>Free Vibration of Functionally Graded Graphene-Platelets Reinforced Composite (FG-GPLRC) Plate with Interval Parameters</i>
10:30	Break
10:45-12:45	Session 11 , Chair: S. Freitag, Ruhr University Bochum (Germany)
10:45	A. Boccamazzo , B. Carboni, G. Quaranta, W. Lacarbonara <i>Hysteretic Tuned Mass Dampers for Seismic Protection</i>
11:05	L. Cavaleri, M. Di Paola, M.F. Ferrotto , V. Sucato <i>Behavior of Structures Equipped with Variable Friction Dissipative Systems</i>
11:25	D. De Domenico , G. Ricciardi <i>Using a Tuned Fluid Inerter for Improving the Seismic Performance of Structures Isolated with Friction Pendulum System</i>
11:45	I. P. Dunn , A. Di Matteo, G. Failla, A. Pirrotta <i>Stochastic Response of Beams Equipped with Tuned Mass Dampers, Considering Spring Inertial Effects, Subjected to Poissonian Loads</i>
12:05	T. Alderucci , F. Genovese, G. Muscolino <i>Explicit Sensitivities of the Stochastic Response of Structural Systems under Spectrum Compatible Fully Non-Stationary Seismic Excitations</i>
12:25	F. Genovese , G. Muscolino, A. Palmeri <i>Comparison of Fully Non-Stationary Artificial Accelerograms Generation Methods in Non-Linear Dynamic Analyses</i>
12:45	Break
13:30-15:30	Session 12 , Chair: E. Patelli, University of Strathclyde (UK)
13:30	F. Cannizzaro , N. Impollonia, G. Cocuzza Avellino, S. Caddemi, I. Caliò <i>Interval Analysis of the Forced Vibration of Beams with Uncertain Damage</i>
13:50	N. Le Carrer <i>On the Guarantees Derived from a Possibilistic Interpretation of Ensemble Predictions and their Operational Use</i>
14:10	F. N. Schietzold, J. Urenda, V. Kreinovich , W. Graf, M. Kaliske <i>Why Ellipsoids in Mechanical Analysis of Wood Structures</i>
14:30	D. G. Giovanis , M. D. Shields <i>Imprecise Subset Simulation for Reliability Analysis</i>

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14:50	J. S. Jehle , V. A. Lange, M. Gerdt <i>Enabling the Evidence Theory through Non-intrusive Parametric Model Order Reduction for Crash Simulations</i>
15:10	M. Modares , M. Desch, R. L. Muhanna, R. L. Mullen <i>Computation of Temporal Uncertainties in Construction Project Management Using Imprecise Probability</i>
15:30	Closing Remarks