ICVRAM-ISUMA 2024

April 25-27, 2024, Shanghai, China

The 4th International Conference on Vulnerability and Risk Analysis and Management
&
The 8th International Symposium on Uncertainty Modelling and Analysis

Sponsor Tongji University

同濟大學
TONGJI UNIVERSITY

Program at-a-Glance

Thursday, April 25

14:00-21:00	**Registration** (Meeting Room 2, 3rd Floor, Kingswell Hotel)	
18:30-21:00	**Buffet Reception** (Multi-Function Hall, 3rd Floor, Kingswell Hotel)	

Friday, April 26

08:30-09:10	**Opening Ceremony** Conference Hall, 1st Floor, Yifu Building	**Chair** Jian-Bing Chen
09:10-09:50	**Keynote Lecture 1** **Jie Li** Structural Reliability under Multiple Loads and Disaster Actions Conference Hall, 1st Floor, Yifu Building	**Chair** Michael H. Faber
09:50-10:30	**Keynote Lecture 2** **M. Hesham El Naggar** Application of Physical Modeling in Seismic Vulnerability Assessment of Geostructures Conference Hall, 1st Floor, Yifu Building	**Chair** Cheng Su
10:30-10:50	Break	
10:50-11:30	**Keynote Lecture 3** **Hong-Zhong Huang** Discussion on Uncertainty in Reliability of Aero-Engine Components Conference Hall, 1st Floor, Yifu Building	**Chair** John D. Sørensen
11:30-12:10	**Keynote Lecture 4** **Bilal M. Ayyub** Market-Based Loss-Amplification Factors for Including Risk Aversion in The Economics of Managing Climate and Other Risks Conference Hall, 1st Floor, Yifu Building	**Chair** Paolo Gardoni
12:30-14:00	**Lunch** (3rd Floor, Xueyuan Food Courts)	
14:00-15:35	**Parallel Session 1**	
15:35-15:55	Break	
15:55-17:30	**Parallel Session 2**	
18:30-21:00	**Dinner** (Magna Art Center) The shuttle will be waiting outside of the Yifu Building at 18:00	

Saturday, April 27

08:30-10:05	**Parallel Session 3**	
10:05-10:25	Break	
10:25-12:00	**Parallel Session 4**	
12:00-14:00	**Lunch** (3rd Floor, Xueyuan Food Courts)	
14:00-15:35	**Parallel Session 5**	
15:35-15:55	Break	
15:55-16:35	**Keynote Lecture 5** **Bruno Sudret** Active Learning Methods for Component and System Reliability Analysis Conference Hall, 1st Floor, Yifu Building	**Chair** Hector A. Jensen
16:35-17:15	**Keynote Lecture 6** **André T. Beck** The Latent Failure Probability: A Conceptual Basis for Robust, Reliability-Based and Risk-Based Design Optimization Conference Hall, 1st Floor, Yifu Building	**Chair** Da-Gang Lu
17:15-17:55	**Keynote Lecture 7** **Mitsuyoshi Akiyama** Life-Cycle Performance and Management of Road Networks Exposed to Multiple Hazards Conference Hall, 1st Floor, Yifu Building	**Chair** Robby Caspeele
18:00-18:20	**Closing Ceremony** Conference Hall, 1st Floor, Yifu Building	**Chair** Yong-Bo Peng
18:20-19:30	**Dinner** (3rd Floor, Xueyuan Food Courts)	

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WELCOME TO ICVRAM-ISUMA 2024

ICVRAM-ISUMA provides a multi-disciplinary forum for the exchange of knowledge and expertise, in the quantification, mitigation and management of risk and uncertainty, and in decision making. The event is aimed at specialized and synergetic developments in both theory and practice.

Hazards, risks and respective mitigation strategies are of rapidly growing interest in infrastructure systems and the built environment. This includes natural and man-made hazards, economical and banking risks, security risks, critical incidents, insurance risks, environmental risks, nuclear risks, structural vulnerability and reliability, infrastructure security and resilience, structural and infrastructure robustness, software reliability, energy risks, supply chain vulnerability, policy development and many more. Major challenges in the development of solutions are concerned with the high complexity and the multi-disciplinary character of the problems as well as with the comprehensive quantification, efficient processing and management of the involved uncertainties. Proposed approaches are being developed using probabilistic (including Bayesian) concepts, fuzzy and interval concepts, imprecise probabilities, and emerging technologies, including supercomputing, big data, and artificial intelligence for engineering, etc.

The objective of this conference is to bring experts and decision makers from different disciplines but working on similar problems together to share information on current and emerging developments and to initiate advancements towards a solution to our challenges through cross-fertilization. This conference will help transition intellectual discussions into robust frameworks for handling emerging vulnerabilities and risks, and provide the leadership and initiative required to respond to national and international disasters.

Jie Li

Tongji University, China
Conference Chair

Michael Beer

Leibniz Universität Hannover, Germany
Conference Co-Chair

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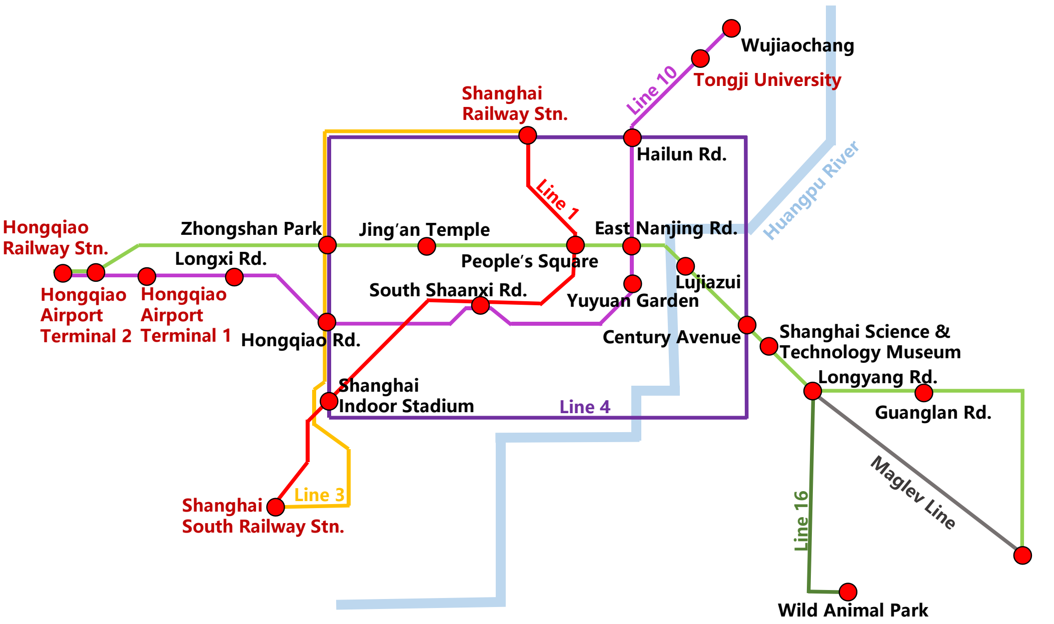
Travel Information

Metro line



From Pudong International Airport (PVG)

By Metro Line 2 to "East Nanjing Road" and transfer Metro Line 10 to "Tongji University" stop (about 100 minutes / RMB 7.00)

By Taxi (around 46 km/ 60 minutes / RMB 160.00)

From Hongqiao International Airport (SHA) or Hongqiao Railway Station

by Metro Line 10 to the "Tongji University" stop (about 60 minutes / RMB 5.00)

by Taxi (around 22 km/ 45 minutes / RMB 80.00)

From Shanghai Railway Station

by Metro Line 4 to "Hailun Road" and transfer Metro Line 10 to "Tongji University" stop (about 40 minutes / RMB 4.00)

by Taxi (around 8 km/ 20 minutes / RMB 30.00)

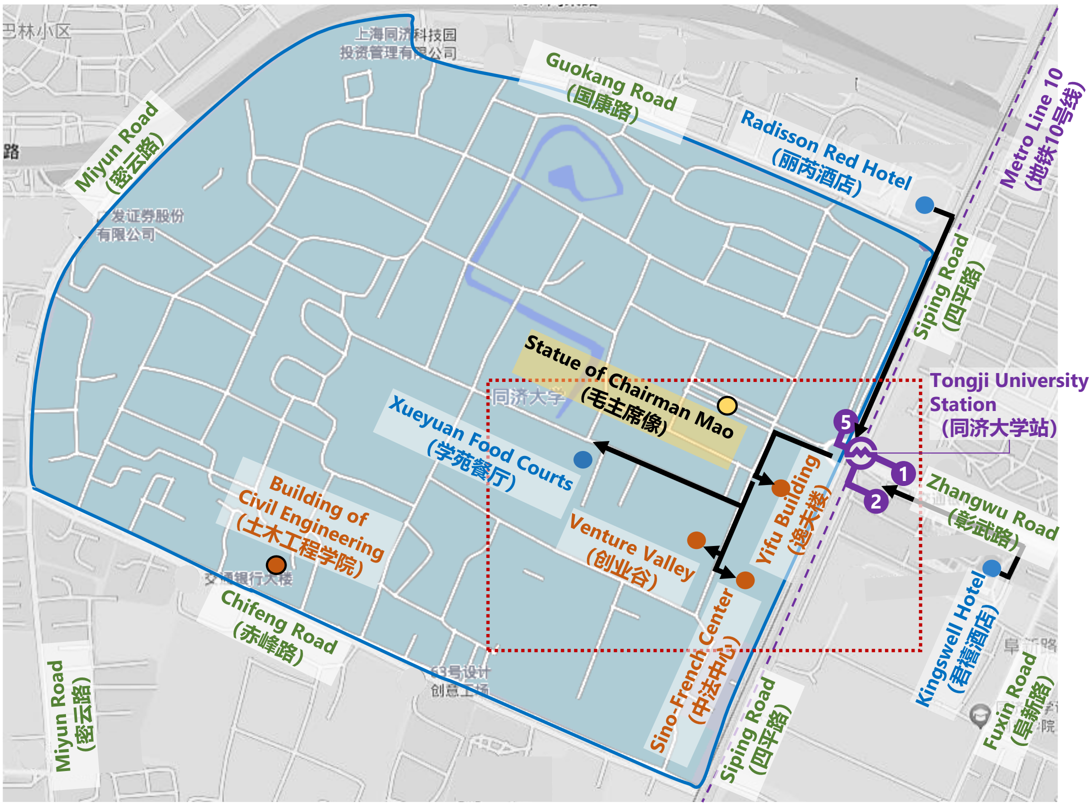
From Shanghai South Railway Station

by Metro Line 3 to "Hongqiao Road" and transfer Metro Line 10 to "Tongji University" stop (about 70 minutes / RMB 5.00)

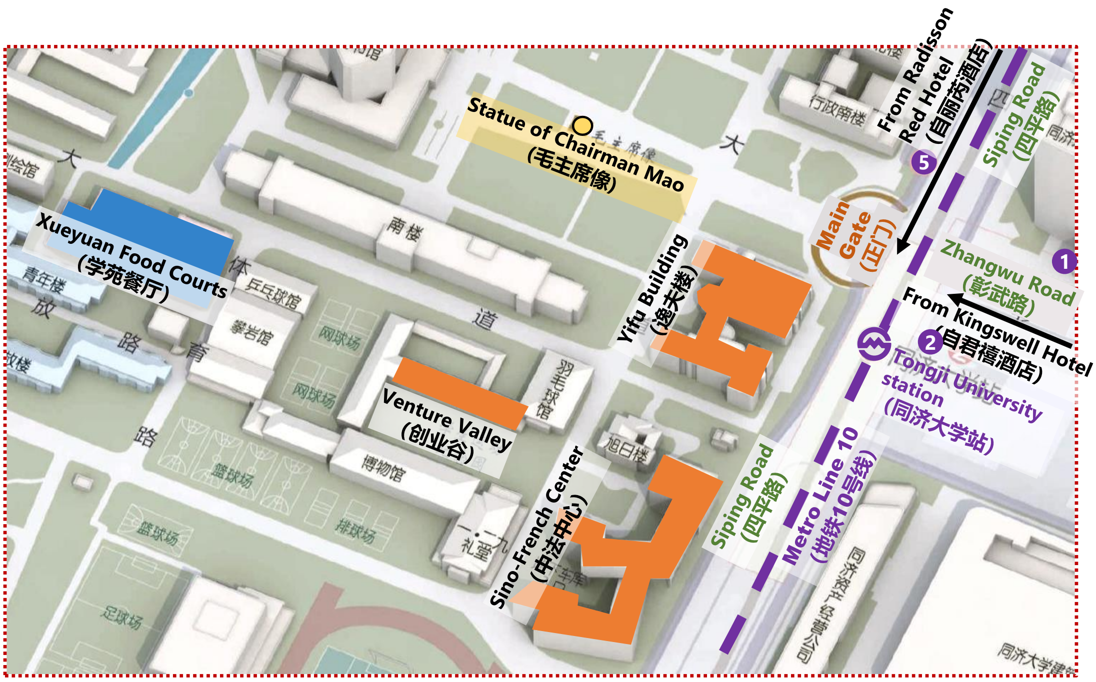
by Taxi (around 22 km/ 40 minutes / RMB 80.00)

Conference Venue

Tongji campus map

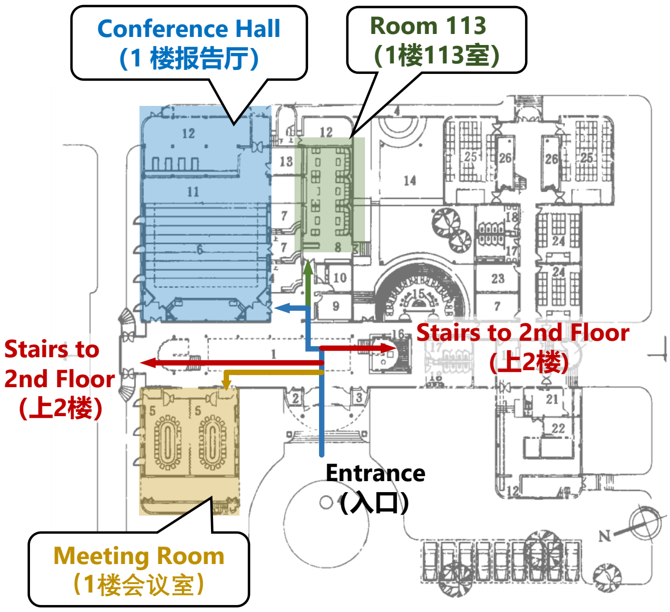


Zoomed map in the vicinity of the conference venues

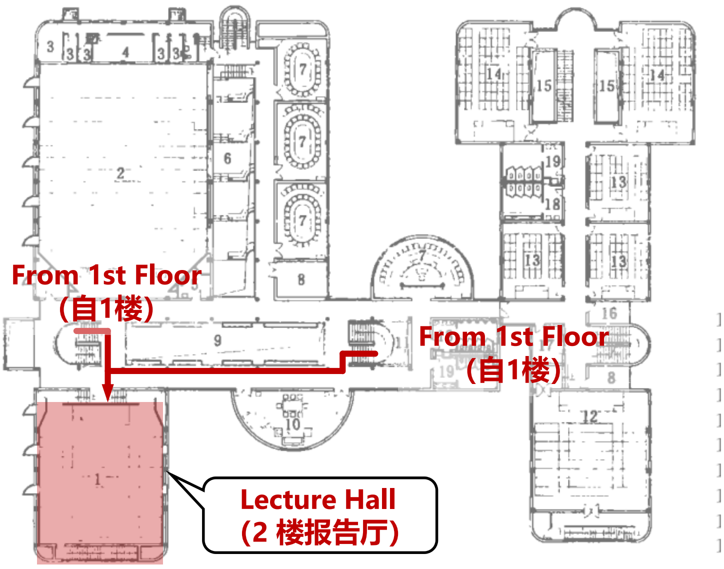


Yifu Building

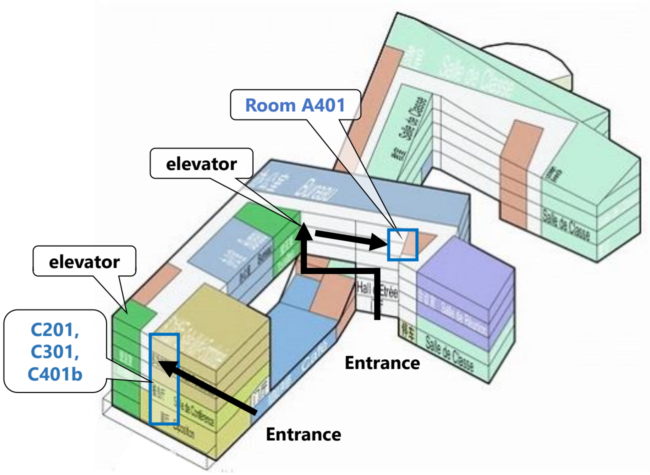
Yifu Building: 1st Floor



Yifu Building: 2nd Floor



Sino-French Center



Venture Valley

Keynote Lecture 1

Friday, April 26, 09:10-09:50, Conference Hall, 1st Floor, Yifu Building

Structural Reliability under Multiple Loads and Disaster Actions

Jie Li
Tongji University, China

Prof. Jie Li is a Chair Professor in the Structural Engineering at Tongji University, the academician of the Chinese Academy of Science, and the director of the International Joint Research Center for Engineering Reliability & Stochastic Mechanics. He received Ph.D. in Structural Engineering from Tongji University, China in 1988, and received an honorary doctorate in engineering science from Aalborg University, Denmark in 2013.

Prof. Li has been devoted to the theoretical research on structural engineering and stochastic mechanics over 35 years. His contributions are distributed in the area of stochastic dynamics, damage mechanics and engineering reliability. Prof. Li is the author of six monographs and more than 400 peer reviewed journal papers. He received more than 20 national and provincial (ministerial) scientific and technological awards, including National Natural Science Award of China. In 2014, Prof. Li was awarded the Alfred M. Freudenthal Medal by ASCE, owing to his academic achievements in the probability density evolution method and in the seismic reliability based design of large-scale infrastructure systems.

Prof. Li served as the president of International Association for Structural Safety and Reliability (IASSAR) from 2017 to 2022, and currently serves as a member of the director board of International Conference of Damage Mechanics (ICDM) and the Fellow of Engineering Mechanics Institute (EMI). Prof. Li also serves as the vice president of Chinese Society of Vibration Engineering.

Abstract

The reliability analysis of engineering structures under multiple loads and disaster actions is an unsolved problem in the development of the reliability research. Starting from the mathematical description of the principle of load coincidence, this lecture discusses in detail the analysis method of the structural response under multiple loads and disaster actions. By introducing the physical synthesis method of reliability analysis, a new approach to the structural reliability under multiple loads and disaster actions is suggested. Some specific research examples and engineering applications are presented. The development showed in the lecture make known that the third generation of structural design theory has become a realistic option in the engineering practice.

Keynote Lecture 2

Friday, April 26, 09:50-10:30, Conference Hall, 1st Floor, Yifu Building

Application of Physical Modeling in Seismic Vulnerability Assessment of Geostructures

M. Hesham El Naggar
Western University, Canada

Dr. Hesham El Naggar is a Distinguished University professor and a world leader in foundation dynamics and geotechnical earthquake engineering. He advanced the state-of-the-art in analysis and design of foundations for dynamic loads. His work on foundation design and geotechnical earthquake engineering has been incorporated into design guidelines recommended by regulatory bodies and learned societies. He is Editor-In-Chief of Soil Dynamics and Earthquake Engineering and past Associate Editor of the Canadian Geotechnical Journal. He published more than 550 technical papers and book chapters including more than 400 in selective and prestigious journals soil-structure interaction and geotechnical earthquake engineering; and consulted on major projects worldwide. He has delivered more than 80 plenary, keynotes and invited speeches at national and international conferences. Dr. El Naggar attracted more than $20M of research funding and graduated more than 120 PhD and Master students. In recognition of his outstanding research contributions, Dr. El Naggar received many prestigious awards including the Cross-Canada Lecture Tour, Geosynthetics, Stermac, Meyerhof and Canadian Geotechnical Colloquium Speaker Awards from the Canadian Geotechnical Society; the Ontario Professional Engineers Medal for Engineering Research & Development; the prestigious 2021 Zhongguancun Award for Outstanding Contribution, from Beijing Council of Science and Technology He is an elected Fellow of Canadian Academy of Engineering, the Engineering Institute of Canada and the American Society for Civil Engineers.

Abstract

The dramatic consequences of recent seismic events (e.g., Indonesia, Haiti, Japan, China and Türkiye) underscored the high seismic vulnerability of the built environment, particularly for critical modern infrastructures. In recent years, vulnerability assessment tools and indices of seismic risk have been established to quantify the level of damage to the whole infrastructure system or its critical elements. In addition, analysis techniques and design provisions were established aiming to ensure safe and reliable infrastructure. Most of the developed methodologies were based on the Performance-Based Seismic Design (PBSD) approach, in which performance objectives define tolerable risk of suffering damage for designated levels of earthquake hazards. Therefore, the delimitation of appropriate parameters, such as inter-story drift-ratio, shear forces and bending moments associated with different levels of damage is significant in describing the performance objective. These damage measures are also the foundation element for the seismic fragility analysis and seismic risk analysis.

Seismic risk analysis is necessary to mitigate the potential losses resulting from future earthquakes. A reliable vulnerability assessment requires the knowledge of the mechanical properties of the examined systems, understanding of their response characteristics along with their potential damage or failure mechanisms. This will furnish the necessary information for comprehensive modeling approaches. Numerous approaches are available

for seismic analysis and design for both aboveground and underground structures, which are characterized by different levels of complexity and sophistication. These approaches aim at assessing the seismic response of the investigated system considering a multitude of uncertain parameters and conditions. Chief among these uncertainties, especially for geostructures, are the soil-structure interaction characteristics and failure mechanisms under earthquake events with varying features that can have a great influence on the structural response. Physical modeling is one of the best tools for evaluating seismic response of geostructures and their potential damage or failure mechanisms as well as quantifying their damage index. It provides experimental data and observations to validate theoretical approaches. Due to limitations of laboratory facilities and cost, only scaled models are used in most physical modeling experiments, and the size effect must be considered carefully. Those limitations are further amplified in the course of investigating geostructures because of the soil-structure interaction effects that have to be considered in the model.

This presentation discusses recent developments in physical modeling techniques for geostructures under seismic loading. It covers innovative testing methods for both 1g and multiple g environments. The investigated geostructures include tunnels, pipelines, subway station structures, culverts, soil retaining structures and bridge foundations. The testing approaches involve a wide range of novel pushover testing apparatus, 1-g large outdoor shake tables and in-door shake tables, arrays of shake tables and centrifuge-mounted shake tables. The experimental measurements and observations include porewater pressure and acceleration measurements of the soil medium, and the forces and bending moments of the tested structure along with its failure pattern and mechanism. Finally, the salient features of the discussed physical modeling methods are highlighted along with their limitations.

Keynote Lecture 3

Friday, April 26, 10:50-11:30, Conference Hall, 1st Floor, Yifu Building

Discussion on Uncertainty in Reliability of Aero-Engine Components

Hong-Zhong Huang
University of Electronic Science and Technology of China, China

Hong-Zhong Huang received the B.S. degree from Wuhan University, Wuhan, China, in 1983, the M.S. degree from Chongqing University, Chongqing, China, in 1988, and the Ph.D. degree from Shanghai Jiao Tong University, Shanghai, China, in 1999, all in mechanical engineering. He is a Full Professor of Mechanical Engineering with the School of Mechanical and Electrical Engineering, University of Electronic Science and Technology of China, Chengdu, China. He is also the Director with the Center for System Reliability and Safety, University of Electronic Science and Technology of China. He has held visiting appointments at several universities in the USA, Canada, and Asia. He has authored or coauthored more than 350 journal papers and eight books in the fields of reliability engineering, optimization design. Prof. Huang is also an ISEAM Fellow, a Technical Committee Member of ESRA, a Co-Editor-in-Chief for the International Journal of Reliability and Applications, and an Editorial Board Member of several international journals.

Abstract

Aero engines are powering the aerospace equipment and significantly influence the overall performance of aircraft. They operate in harsh environments, where components are subject to high pressure, high speed, high temperature, and prolonged cyclical loading. The reliability investigations in terms of aero engine components such as turbine shafts, turbine discs, turbine blades, bearings, and transmission gears, challenges arise due to small samples and the limited amount of test data. Furthermore, various internal and external uncertainties throughout their life cycle pose challenges for ensuring the high reliability and longevity of aero engines. This work begins by analyzing the sources of uncertainty in key aero engine components and introduces methods for quantifying stochastic and epistemic uncertainties. Then, followed by proposing reliability analysis and structural optimization methods considering model and parameter uncertainties, probabilistic methods of fatigue analysis under small samples and multi-source uncertainties, and fatigue life prediction methods. Ultimately, offering perspectives on uncertainty investigations in the reliability of aero engine components.

Keynote Lecture 4

Friday, April 26, 11:30-12:10, Conference Hall, 1st Floor, Yifu Building

Market-Based Loss-Amplification Factors for Including Risk Aversion in The Economics of Managing Climate and Other Risks

Bilal M. Ayyub
University of Maryland, USA

Bilal Ayyub is Professor and the director of the University of Maryland Center for Technology and Systems Management. His specialties and expertise are in the areas of risk, uncertainty and decision analysis, systems engineering, risk management including finance, and climate adaptation. He has completed research projects and studies for NOAA, FRA, NSF, USCG, DOD, DHS, and several engineering companies. He is an Academician of the Georgian National Academy of Science, Tbilisi, Georgia. As a distinguished member of the ASCE, an honorary member of ASME, and a fellow SEI, SNAME and SRA, he has served the engineering community in various leadership capacities. Among the 650 publications co-authored with colleagues and former students are more than 20 books, including several textbooks adopted for courses at universities. He is also associated with BMA Engineering, working on infrastructure and defense systems including economic and financial modeling and risk analysis. He has served on the board of several research and development companies.

Abstract

Some decisions entail significant risk requiring special attention to risk tolerances and attitudes including risk aversion. Organizations typically institute enterprise risk management programs to efficiently and effectively manage safety, reliability and financial risks for their customers, employees and communities in a changing climate with intensifying risks, such as coastal storms, wildfire, air quality, etc. Consequences from such events could include human life and property losses, health effects, environmental damage, service loss, and other indirect financial and economic impacts. A spectrum of risk quantification and management methods are available for assessing these hazards. Varying risk tolerances and attitudes of stakeholders creates situations that are central to decision-making where the safety, service delivery reliability, affordability and the financial wellbeing of entities come together and interact in a complex manner. This paper sets context, defines key terms, and develops an innovative approach for methodically reflecting risk tolerance and attitude with a focus on risk aversion in informing risk management decisions by offering flexibility to account for preferences by stakeholders in a structured manner. The concept of risk-aversion amplification factors is proposed to reflect attitudes and preferences of decision makers in typical economic models used in benefit-cost analysis. Such amplification factors can be calibrated by applicable markets, such as insurance and catastrophe bond markets and used to estimate certainty-equivalent valuations of risks, costs and benefits. The proposed methods are illustrated in the context of wildfire risk management for communities and utilities using two examples from these domains for enhancing resilience.

Keynote Lecture 5

Saturday, April 27, 15:55-16:35, Conference Hall, 1st Floor, Yifu Building

Active Learning Methods for Component and System Reliability Analysis

Bruno Sudret
ETH Zürich, Switzerland

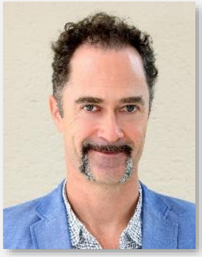
Bruno Sudret is a professor of Risk, Safety and Uncertainty quantification at ETH Zürich since 2012. His teaching and research interests are computational methods for uncertainty quantification, reliability and sensitivity analysis, Bayesian approaches for model calibration and reliability-based design optimization, among others.
B. Sudret received a master's of science from the Ecole Polytechnique (France) in 1993. He then obtained a master's degree and a Ph.D in civil engineering from the "Ecole Nationale des Ponts et Chaussees" (France) in 1996 and 1999, respectively. Dr. Sudret has been working in probabilistic engineering mechanics and uncertainty quantification for engineering systems since 2000: first as a post-doctoral fellow at the University of Berkeley (California), then as a researcher at EDF R&D (the French world leader in nuclear power generation) where he was the head of a group specialized in probabilistic engineering mechanics (2001-2008). From 2008 to 2011 he has worked as the Director of Research and Strategy at Phimeca Engineering (France).
B. Sudret is the author and co-author of more than 300 publications in journal and conference proceedings. He currently serves in the editorial board of Reliability Engineering and Systems Safety, Probabilistic Engineering Mechanics and Structural Safety. He promotes the dissemination of uncertainty quantification techniques through the development of the software UQLab (www.uqlab.com) and the community platform UQWorld (www.uqworld.org).

Abstract

Structural reliability analysis evaluates the safety of structures and systems under uncertain conditions. Traditional simulation methods for estimating failure probability are computationally intensive. As an alternative, the past decade has seen the introduction of surrogate-based methods. These methods involve creating a metamodel of the original limit-state functions for use in reliability estimation algorithms. Active learning techniques iteratively refine the surrogate model's experimental design using suitable learning functions.
This presentation surveys recent advancements in active learning for reliability analysis, identifying a common framework that includes a surrogate model, a reliability estimation algorithm, a learning function, and a stopping criterion. By non-intrusively integrating these components, we can reconstruct most existing active learning methods. We conducted a comprehensive benchmark of 39 active learning strategies across 20 selected reliability problems, resulting in approximately 12,000 analyses. This benchmarking helped identify performance patterns and generalization capabilities of different approaches, leading to best practice recommendations.
The second part of the talk extends these methods to system reliability analysis, where surrogate models are developed for each limit state separately. We introduce an optimal enrichment scheme, informed by global sensitivity analysis, to prioritize surrogate model updates. The talk concludes with various structural engineering applications, showcasing the practical applications of these methods

Keynote Lecture 6

Saturday, April 27, 16:35-17:15, Conference Hall, 1st Floor, Yifu Building



The Latent Failure Probability: A Conceptual Basis for Robust, Reliability-Based and Risk-Based Design Optimization

André T. Beck
University of São Paulo, Brazil

Prof. André Teófilo Beck graduated in Mechanical Engineering from Universidade Federal do Rio Grande do Sul (Brazil, 1996), obtained a master's degree in Mechanical Engineering from Universidade Federal de Santa Catarina (Brazil, 1998). He obtained a Doctoral degree (Ph.D.) in Civil Engineering from University of Newcastle (Australia, 2003), and works as Associate Professor at the Department of Structural Engineering, São Carlos School of Engineering, University of São Paulo. He is further a member of the Brazilian Association of Computational Methods in Engineering (ABMEC) and of the Uncertainty Quantification and Stochastic Mechanics Committee of the Brazilian Association of Mechanical Sciences (ABCM) and serves as a peer-reviewer for the main Brazilian Research agencies FAPESP, CAPES and CNPq. His research interests include Structural Mechanics and Structural Safety, in particular: structural reliability, stochastic processes, structural optimization. Finally, he is a member of the Editorial Boards of the Journal of the Brazilian Society of Mechanical Sciences and Engineering, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Reliability Engineering & System Safety and Structural Safety. In 2022, Prof. Beck was listed among the top 2% most influential researchers in the area of Civil Engineering.

Abstract

It is nowadays well accepted that engineering systems need to be designed considering the inherent uncertainties in demands and capacities. Robust, reliability-based and risk-based optimization are three modern approaches to address the optimal design problem under objective aleatory uncertainty, that is: uncertainty which can be quantified using probability theory. Yet, subjective epistemic uncertainties, related to limitations of knowledge, social, political, financial, organizational, and behavioral factors, human errors, etc., cannot be quantified probabilistically, but also need to be considered in design optimization. In this talk, an optimal redundancy allocation problem in structural engineering is addressed: it is shown that conventional RBDO formulations lead to single element non-redundant solutions. The "Latent Failure Probability" concept is proposed to address epistemic uncertainties in optimal design of structural systems, and this leads to redundant optimal systems. Application to risk-based progressive collapse of frame structures is also addressed.

Keynote Lecture 7

Saturday, April 27, 17:15-17:55, Conference Hall, 1st Floor, Yifu Building

Life-Cycle Performance and Management of Road Networks Exposed to Multiple Hazards

Mitsuyoshi Akiyama
Waseda University, Japan

Dr. Mitsuyoshi Akiyama is a Professor of Structural Engineering in the Department of Civil and Environmental Engineering at Waseda University, Tokyo, Japan. He has published papers related to (i) reliability, risk, and resilience of structure and infrastructure under multi-hazard issues (e.g., earthquake and tsunami); (ii) effects of climate change on functionality of civil infrastructure systems; (iii) life-cycle performance assessment of deteriorating concrete structures using experimental evidence, probabilistic analysis, and finite element method; and (iv) advancement of infrastructure's maintenance through integration of machine learning, numerical simulation, reliability analysis, and updating theory. Dr. Akiyama is serving as a Managing Editor of Structure and Infrastructure Engineering (Taylor & Francis) and an Associate Editor of Journal of Bridge Engineering (ASCE). He also serves on the editorial boards of Structural Safety (Elsevier). Dr. Akiyama has been involved in the ASCE Technical Council on Life-Cycle Performance, Safety, Reliability and Risk of Structural System for more than 15 years. He is the Secretary of Executive Committee of the International Association for Bridge Maintenance and Safety (IABMAS) and Executive Committee Member of the International Association for Life Cycle Civil Engineering (IALCCE). He contributes to several activities in International Association for Bridge and Structural Engineering (IABSE) including Chair of Commission 6 -Sustainability. Dr. Akiyama is the President of the non-profit organization (NPO) Engineers-Without-Borders, Japan. Dr. Akiyama is the recipient of several awards including the 2023 Scientific Outstanding Paper in IABSE.

Abstract

Tsunami-induced disasters pose a significant risk to coastal communities. As climate change leads to sea-level rise, both the frequency and intensity of tsunamis are expected to increase in a nonstationary manner due to the progressive long-term variability in sea levels. Consequently, the reliability of coastal infrastructure systems vulnerable to tsunami hazards will progressively deteriorate over time. It is essential to develop a hazard assessment procedure that integrates tsunamis occurring at random intervals with the ongoing rise in sea levels. This paper introduces a novel framework for assessing tsunami hazards over time, taking into account the nonstationary effects of sea-level rise driven by climate change, based on a non-Poisson stochastic renewal process. Time-variant probabilistic sea-level rise is modeled using various climate models and data from multiple studies. Conditional tsunami hazard curves, which consider sea-level rise, are estimated by conducting tsunami propagation analyses under different scenarios of sea-level rise and by Monte Carlo simulations that account for the uncertainties related to earthquake fault movements. Finally, this paper develops a new concept for time-variant tsunami hazard assessment that considers the nonstationary impacts of sea-level rise, employing a non-Poisson stochastic renewal process. An illustrative example is provided by applying this framework to several municipalities in Kochi Prefecture, Japan, which are at risk from the anticipated Nankai-Tonankai earthquake. The implications of sea-level rise on time-variant tsunami hazards under both Poisson and non-Poisson earthquake occurrence processes are discussed. As an application of the probabilistic tsunami hazard curve including the effect of sea-level rise, the risk curves and expected values associated with disaster waste are estimated.

Parallel Sessions at-a-Glance

Parallel Session 1: Friday, April 26, 14:00-15:35

Venue	Minisymposium	Chair
Conference Hall, 1st Floor, Yifu Building	**MS02 (I)**: Dealing with Uncertainties in System Identification and Structural Health Monitoring	Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology)
Meeting Room, 1st Floor, Yifu Building	**MS05 (I)**: Uncertainty Quantification and Structural Reliability	Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)
Room 113, 1st Floor, Yifu Building	**MS18 (I)**: Dynamic Reliability of Conceptual Dynamical Systems	Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)
Lecture Hall, 2nd Floor, Yifu Building	**MS22 (I)**: Wind Hazard Modeling and Structural Fragility Analysis	Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology)
C201, Sino-French Center	**MS11 (I)**: Vibration Analysis and Suppression on Nonlinear Structures with Random Loads	Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)
C301 Sino-French Center	**MS25 (I)**: Multi-Dimension Resilience Enhancement for Urban Critical Infrastructure Systems	Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)
C401b Sino-French Center	**MS24 (I)**: Uncertainty Modelling and Computational Challenges in Stochastic Dynamics	Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover)
A401 Sino-French Center	**Student Award Selection (I)**	Hong-Zhe Dai (Harbin Institute of Technology), Sheng-Han Zhang (The Hong Kong University of Science and Technology)
Room 104 Venture Valley	**Student Award Selection (II)**	Bin Pei (Northwestern Polytechnical University), Qing-Xia Yue (Shandong Jianzhu University)

Parallel Session 2: Friday, April 26, 15:55-17:30

Venue	Minisymposium	Chair
Conference Hall, 1st Floor, Yifu Building	**MS03**: Design of Complex Systems and Structures under Uncertainty	Hector A. Jensen (Universidad Técnica Federico Santa María), Marcos A. Valdebenito (Technische Universität Dortmund), Di-Xiong Yang (Dalian University of Technology)
Meeting Room, 1st Floor, Yifu Building	**MS05 (II)**: Uncertainty Quantification and Structural Reliability	Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)
Room 113, 1st Floor, Yifu Building	**MS18 (II)**: Dynamic Reliability of Conceptual Dynamical Systems	Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)
Lecture Hall, 2nd Floor, Yifu Building	**MS22 (II)**: Wind Hazard Modeling and Structural Fragility Analysis	Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology)
C201, Sino-French Center	**MS11 (II)**: Vibration Analysis and Suppression on Nonlinear Structures with Random Loads	Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)
C301 Sino-French Center	**MS14**: Machine Learning for Structural Control and Health Monitoring	Pei Pei (Jiangsu University of Science and Technology), Sha Wei (Shanghai University)
C401b Sino-French Center	**MS24 (II)**: Uncertainty Modelling and Computational Challenges in Stochastic Dynamics	Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover)
A401 Sino-French Center	**Student Award Selection (III)**	You Dong (The Hong Kong Polytechnic University), Zhen-Hao Zhang (Changsha University of Science and Technology)
Room 104 Venture Valley	**Student Award Selection (IV)**	Shao-Juan Ma (North Minzu University), Zhi-Qiang Wu (Tianjin University)

Parallel Session 3: Saturday, April 27, 08:30-10:05

Venue	Minisymposium	Chair
Conference Hall 1st Floor, Yifu Building	**MS16 (I)**: Advances in Uncertainty Quantification and Propagation in Earthquake Engineering	Jun Xu (Hunan University), Zhao Yang (Wuhan University of Science and Technology), Zhang-Jun Liu (Wuhan Institute of Technology)
Meeting Room 1st Floor, Yifu Building	**MS05 (III)**: Uncertainty Quantification and Structural Reliability	Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)
Room 113 1st Floor, Yifu Building	**MS06 (I)**: Reliability Design Analysis and Optimization of Structures and Critical Infrastructures	Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)
Lecture Hall 2nd Floor, Yifu Building	**MS09 (I)**: Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions	Jie Zhang (Tongji University), Ding Wang (Yanshan University)
C201 Sino-French Center	**MS11 (III)**: Vibration Analysis and Suppression on Nonlinear Structures with Random Loads	Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)
C301 Sino-French Center	**MS25 (II)**: Multi-Dimension Resilience Enhancement for Urban Critical Infrastructure Systems	Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)
C401 Sino-French Center	**MS17 (I)**: Data-Driven and Hybrid Approaches for Risk and Resilience Analysis of Infrastructure	Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)
A401 Sino-French Center	**MS13 (I)**: AI for Uncertainty Quantification	Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)
Room 104 Venture Valley	**MS04 (I)**: Probabilistic Seismic Hazard, Vulnerability Analysis and Earthquake Catastrophe Risk Modeling of Modern Cities	Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University)
Room 103, Venture Valley	**MS01**: Coping with Imprecision in Structural Reliability Analysis	Matthias G. R. Faes (Technische Universität Dortmund), Marcos A. Valdebenito (Technische Universität Dortmund), Peng-Fei Wei (Northwestern Polytechnical University), Xiu-Kai Yuan (Xiamen University)
Room 201 Venture Valley	**MS08**: Seismic Fragility Analysis and Performance Assessment of Underground Infrastructure under Uncertainties	Zi-Lan Zhong (Beijing University of Technology), Zhen Cui (Chinese Academy of Sciences), M. Hesham El Naggar (Western University)

Parallel Session 4: Saturday, April 27, 10:25-12:00

Venue	Minisymposium	Chair
Conference Hall 1st Floor, Yifu Building	**MS16 (II)**: Advances in Uncertainty Quantification and Propagation in Earthquake Engineering	Jun Xu (Hunan University), Zhao Yang (Wuhan University of Science and Technology), Zhang-Jun Liu (Wuhan Institute of Technology)
Meeting Room 1st Floor, Yifu Building	**MS05 (IV)**: Uncertainty Quantification and Structural Reliability	Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)
Room 113 1st Floor, Yifu Building	**MS06 (II)**: Reliability Design Analysis and Optimization of Structures and Critical Infrastructures	Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)
Lecture Hall 2nd Floor, Yifu Building	**MS09 (II)**: Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions	Jie Zhang (Tongji University), Zi-Jun Cao (Southwest Jiaotong University)
C201 Sino-French Center	**MS11 (IV)**: Vibration Analysis and Suppression on Nonlinear Structures with Random Loads	Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)
C301 Sino-French Center	**MS23 (I)**: Resilience and Sustainability Informed integrity Management of Infrastructure Systems	Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)
C401b Sino-French Center	**MS17 (II)**: Data-Driven and Hybrid Approaches for Risk and Resilience Analysis of Infrastructure	Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)
A401 Sino-French Center	**MS13 (II)**: AI for Uncertainty Quantification	Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)
Room 104 Venture Valley	**MS04 (II)**: Probabilistic Seismic Hazard, Vulnerability Analysis and Earthquake Catastrophe Risk Modeling of Modern Cities	Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University)
Room 103, Venture Valley	**MS10**: Robustness Design and Quantification for New and Existing Structures against Disproportional Collapse	Robby Caspeele (Ghent University), De-Cheng Feng (Southeast University), Lu-Chuan Ding (Tongji University)
Room 201 Venture Valley	**MS07**: Multiple Hazard Resilience Analysis and Enhancement of Critical Infrastructure under Uncertainties	Zhong-Kai Huang (Tongji University), Dong-Ming Zhang (Tongji University), Hong-Wei Huang (Tongji University)

Parallel Session 5: Saturday, April 27, 14:00-15:35

Venue	Minisymposium	Chair
Conference Hall 1st Floor, Yifu Building	**MS02 (II)**: Dealing with Uncertainties in System Identification and Structural Health Monitoring	Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology)
Meeting Room 1st Floor, Yifu Building	**MS20**: Physics-informed Surrogate Modeling for Uncertainty Quantification and Optimization	Cheng Su (South China University of Technology), Hao Zhou (South China University of Technology)
Room 113 1st Floor, Yifu Building	**MS06 (III)**: Reliability Design Analysis and Optimization of Structures and Critical Infrastructures	Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)
Lecture Hall 2nd Floor, Yifu Building	**MS09 (III):** Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions	Jie Zhang (Tongji University), Shui-Hua Jiang (Nanchang University)
C201 Sino-French Center	**MS15:** Advances in Risk Assessment and Resilience Enhancement of Bridge Infrastructure	Chao-Lin Song (Tongji University), Ze-Yu Wang (China University of Geosciences)
C301 Sino-French Center	**MS23 (II)**: Resilience and Sustainability Informed integrity Management of Infrastructure Systems	Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)
C401b Sino-French Center	**MS21**: Advancements in Stochastic Dynamics for Design and Assessment of Resilient and Sustainable Engineering Structures	Fan Kong (Hefei University of Technology), Yuan-Jin Zhang (Wuhan University of Technology), Alberto Di Matteo (University of Palermo)
A401 Sino-French Center	**MS13 (III)**: AI for Uncertainty Quantification	Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)
Room 104 Venture Valley	**MS19**: Data-Driven Risk and Resilience Modeling of Infrastructure against Catastrophic Hazards	Xiao-Wei Wang (Tongji University), Rui-Wei Feng (The Hong Kong Polytechnic University), Yao-Han Li (Hong Kong Metropolitan University)
Room 103, Venture Valley	**MS26**: Dynamics, Loads and Probabilistic Design of Offshore Wind Turbines	Yu-Peng Song (Nanjing Tech University), Zi-Li Zhang (Tongji University)
Room 201 Venture Valley	**MS12**: Mitigating Uncertainties in Predicting the Life-Cycle Performance of Aging Structures and Infrastructure Systems Using Observational Information	Si-Yi Jia (Waseda University), Mitsuyoshi Akiyama (Waseda University), Michiyuki Hirokane (Kansai University)

Parallel Session 1

Parallel Session 1 | Friday, April 26, 14:00-15:20
Conference Hall, 1st Floor, Yifu Building
MS02 (I): Dealing with Uncertainties in System Identification and Structural Health Monitoring

organized by Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology), Costas Papadimitriou (University of Thessaly)

Chair: Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology)

14:00-14:20 | (Invited Talk) Presenter: Wang-Ji Yan (University of Macau)
A0358: Exploring some new Bayesian learning schemes for enhanced structural model updating and damage detection
Wang-Ji Yan, Xin-Yu Jia, Meng-Hao Ping, Jiang Mo, Lin-Feng Mei, Yu-Song Liu, Ka-Veng Yuen, Costas Papadimitrou

14:20-14:35 | Presenter: Lin-Feng Mei (University of Macau)
A0104: Data-driven structural damage detection with variational inference-based Bayesian nonparametric model
Lin-Feng Mei, Wang-Ji Yan

14:35-14:50 | Presenter: Zeng-Yu Liu (Guangxi University)
A0138: Efficient Bayesian model updating based on reduced-order eigenvalue problem
Jia-Hua Yang, Zeng-Yu Liu

14:50-15:05 | Presenter: Xin-Yu Jia (Hebei University of Technology)
A0143: Understanding uncertainties in updating models: an analytical perspective for hierarchical Bayesian modeling framework in structural dynamics
Xin-Yu Jia, Wang-Ji Yan, Costas Papadimitriou, Ka-Veng Yuen

15:05-15:20 | Presenter: Shao-Chen Yang (Shanghai Jiao Tong University)
A0240: A monocular vision-based targetless modal identification method for a membrane antenna
Shao-Chen Yang, Wu-Jun Chen

Parallel Session 1 | Friday, April 26, 14:00-15:35
Meeting Room, 1st Floor, Yifu Building
MS05 (I): Uncertainty Quantification and Structural Reliability

organized by Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Zeng Meng (Hefei University of Technology), Guo-Hai Chen (Dalian University of Technology)

Chair: Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)

14:00-14:20 | (Invited Talk) Presenter: Matthias G. R. Faes (Technische Universität Dortmund)

A0137: Fractional moment estimation from polynomial chaos expansions

Lukáš Novak, Marcos A. Valdebenito, Matthias G. R. Faes

14:20-14:35 | (Remote Talk) Presenter: Miroslav Vořechovský (Brno University of Technology)

A0054: Active learning for reliability and sensitivity analyses with discrete-state performance functions

Miroslav Vořechovský

14:35-14:50 | Presenter: Han-Shu Chen (Hohai University)

A0048: Stochastic bifurcation analysis of nonlinear MDOF vehicle system with generalized fractional damping

Han-Shu Chen, Di-Xiong Yang, Guo-Hai Chen, Zhuo-Jia Fu

14:50-15:05 | Presenter: Hui Huo (Dalian University of Technology)

A0067: Uncertainty quantification for laminated composite plates with multiple stochastic sources via a novel viewpoint of probability integral

Hui Huo, Jian Zhao, Di-Xiong Yang

15:05-15:20 | Presenter: Wan-Xin He (Dalian University of Technology)

A0087: A metaheuristic data-driven probability uncertainty analysis method based on the B-spline theory and the maximum entropy method

Gang Li, Yi-Yuan Wang, Wan-Xin He, Chang-Ting Zhong, Yi-Xuan Wang

15:20-15:35 | Presenter: Lu-Yi Li (Northwestern Polytechnical University)

A0371: Reduced-order model-based reliability analysis methods for structures with hybrid uncertainty

Lu-Yi Li, Meng-Qing Dang, Ze-Ming Chang

Parallel Session 1 | Friday, April 26, 14:00-15:15

Room 113, 1st Floor, Yifu Building

MS18 (I): Dynamic Reliability of Conceptual Dynamical Systems

organized by Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)

Chair: Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)

14:00-14:15 | Presenter: Ya-Jie Li (Henan University of Urban Construction)

A0069: Stochastic P-bifurcation in a tri-stable van der Pol oscillator with fractional derivative excited by combined Gaussian white noises

Ya-Jie Li, Zhi-Qiang Wu

14:15-14:30 | Presenter: Jin-Zhong Ma (Shanxi University)
A0085: Predicting catastrophic high-amplitude oscillations in an airfoil system under extreme flight environment
Jin-Zhong Ma, Rui-Fang Wang, Qi Liu, Yong Xu

14:30-14:45 | Presenter: Wei-Li Guo (Northwestern Polytechnical University)
A0097: Reliability design of a hypersonic airfoil with freeplay in random fluctuating flow via nonlinear energy sink
Wei-Li Guo, Yong Xu

14:45-15:00 | Presenter: Mao-Lin Deng (Zhejiang University)
A0099: Dynamical analysis of nonlinear system with FDD and driven by FGn
Mao-Lin Deng, Qiang-Feng Lü

15:00-15:15 | Presenter: Hu-Fei Li (North Minzu University)
A0153: Stochastic dynamical analysis for renewable power system excited by multiplicative fractional Gaussian noise based on graph neural network
Hu-Fei Li, Shao-Juan Ma

Parallel Session 1 | Friday, April 26, 14:00-15:20
Lecture Hall, 2nd Floor, Yifu Building

MS22 (I): Wind Hazard Modeling and Structural Fragility Analysis

organized by Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology), Teng Wu (University of Buffalo)

Chair: Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology)

14:00-14:20 | (Invited Talk) Presenter: Kai Wei (Southwest Jiaotong University)
A0368: Effect of wave-current-surge interaction on the typhoon waves in Qiongzhou Strait: Insights from Typhoon Kalmaegi
Kai Wei, Hao-Yu Li

14:20-14:35 | Presenter: Gen-Shen Fang (Tongji University)
A0095: Uncertainty quantification of wind field parameters and propagation to buffeting response of long-span bridges
Gen-Shen Fang, Zi-Hang Liu, Yao-Jun Ge

14:35-14:50 | Presenter: Jian-Ming Hao (Chang'an University)
A0320: Modeling of downburst outflow for bridge deck test in traditional wind tunnel using a multi-blade flow control device
Jian-Ming Hao, Yu Feng, Bo Su, Jia-Wu Li

14:50-15:05 | Presenter: Xu Hong (Hefei University of Technology)
A0151: Assessing the typhoon hazard for the southeast coast of China using the change-of-measure method
Xu Hong, Tian-Le Chen, Zhi-Qiang Wan

15:05-15:20 | Presenter: Yi-Lin Shi (Zhejiang University)
A0177: Terrain modification of parametric tropical cyclone wind-rain field models using a deep learning approach
Yi-Lin Shi, Nai-Yu Wang

Parallel Session 1 | Friday, April 26, 14:00-15:40
C201, Sino-French Center
MS11 (I): Vibration Analysis and Suppression on Nonlinear Structures with Random Loads

organized by Ying Lei (Xiamen University), Zhong-Hua Liu (Xiamen University), Rong-Hua Huan (Zhejiang University), Lin-Cong Chen (Huaqiao University)

Chair: Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)

14:00-14:20 | (Invited Talk) Presenter: Yan-Mei Kang (Xi'an Jiaotong University)
A0341: Moment dynamics of periodically driven noisy underdamped mechanical oscillator systems
Yan-Mei Kang, Ruo-Nan Liu, Ya-Min Ding

14:20-14:40 | (Invited Talk) Presenter: Shun-Long Li (Harbin Institute of Technology)
A0249: Time-frequency features of non-stationary vibrations of time-varying train-bridge interaction system
Ye Mo, Shun-Long Li

14:40-14:55 | Presenter: Jia-Le Han (Xidian University)
A0051: Response characteristics of energy harvesters with galloping and base excitations
Jia-Le Han, Dong-Mei Huang

14:55-15:10 | Presenter: Ya-Jie Li (Henan University of Urban Construction)
A0068: Stochastic stability and parametric control in a generalized and tri-stable van der pol system with fractional element driven by multiplicative noise
Ya-Jie Li, Zhi-Qiang Wu

15:10-15:25 | Presenter: Yang-Yang Xiao (Harbin Institute of Technology Shenzhen)
A0072: Steady-state response prediction for high-dimensional nonlinear systems under Gaussian white noise excitations
Yang-Yang Xiao, Zhong-Dong Duan

15:25-15:40 | Presenter: Ying Hao (Yanshan University)
A0076: Stochastic flutter analysis of a three-degree-of-freedom airfoil under vertical turbulence disturbance
Ying Hao, Xin-Yu Guo

Parallel Session 1 | Friday, April 26, 14:00-15:00
C301, Sino-French Center
MS25 (I): Multi-Dimension Resilience Enhancement for Urban Critical Infrastructure Systems

organized by Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)

Chair: Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)

14:00-14:15 | Presenter: Yi-Qiong Zhang (Huazhong University of Science and Technology)
A0259: A decoupled approach to support resilience assessment and enhancement of interdependent infrastructure system
Yi-Qiong Zhang, Min Ouyang

14:15-14:30 | Presenter: Da-Shuai Li (Harbin Institute of Technology)
A0247: A multilevel structural reliability analysis method based on Kriging model and generalized subset simulation
Da-Shuai Li, Hong-Zhe Dai

14:30-14:45 | Presenter: Chong-Yang Du (Huazhong University of Science and Technology)
A0258: Seismic resilience patterns and enhancement of transport accessibility to medical services
Chong-Yang Du, Min Ouyang

14:45-15:00 | Presenter: Alessandro Contento (Fuzhou University)
A0340: Modeling of the evolution of the built environment
Alessandro Contento, Jessica Boakye, Bruno Brideghella, Paolo Gardoni

Parallel Session 1 | Friday, April 26, 14:00-15:35
C401b, Sino-French Center
MS24 (I): Uncertainty Modelling and Computational Challenges in Stochastic Dynamics

organized by Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Jian-Bing Chen (Tongji University), Michael Beer (Leibniz Universität Hannover)

Chair: Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover)

14:00-14:20 | (Invited Talk) Presenter: Vasileios Fragkoulis (University of Liverpool)
A0202: First-passage probability determination of hysteretic fractional oscillators under imprecise stationary Gaussian loads
Vasileios C. Fragkoulis, Danko J. Jerez, Pei-Hua Ni, Ioannis P. Mitseas, Marcos A. Valdebenito, Matthias G. R. Faes, Michael Beer

14:20-14:35 | Presenter: Athanasios Pantelous (Monash University)
A0361: On the existence, uniqueness and calculation of wiener path integral most probable paths
Asela Nawagamuwage, Ioannis A. Kougioumtzoglou, Athanasios A. Pantelous

14:35-14:50 | Presenter: Ya-Zhou Xu (Xi'an University of Architecture and Technology)
A0208: A pseudo-spectral method for generalized density evolution equation
Ya-Zhou Xu, Rui Tian

14:50-15:05 | Presenter: Yi Luo (Leibniz Universität Hannover)
A0315: Stochastic response analysis using dimension-reduced probability density evolution equation (DR-PDEE) with enhanced tail-accuracy
Yi Luo, Chao Dang, Pol D. Spanos, Matteo Broggi, Michael Beer

15:05-15:20 | Presenter: Xin Huang (Tongji University)
A0339: MF-discrepancy theory and MF-discrepancy-based point-selection strategy for nonlinear stochastic response analysis of structures with independent random variables
Xin Huang, Jian-Bing Chen

15:20-15:35 | Presenter: Yuan-Zhi Cao (Changsha University of Science and Technology)
A0307: Wind turbine foundation ring fatigue reliability analysis under wind load considering threshold-crossing duration
Yuan-Zhi Cao, Yu Liu, Zhen-Hao Zhang

Parallel Session 1 | Friday, April 26, 14:00-15:15
A401, Sino-French Center
Student Award Selection (I)

organized by The Organization Committee of the ICVRAM-ISUMA-2024

Chair: Hong-Zhe Dai (Harbin Institute of Technology), Sheng-Han Zhang (The Hong Kong University of Science and Technology)

14:00-14:15 | Presenter: Yi Zhang (Tongji University)
A0351: Leak monitoring of urban water supply pipelines in service using fluid acoustic and pressure measurement
Yi Zhang, Su-Zhen Li

14:15-14:30 | Presenter: Jiang Mo (University of Macau)
A0289: A physical information-embedded deep network for high-dimensional stochastic system identification
Jiang Mo, Wang-Ji Yan

14:30-14:45 | Presenter: Yi-Fan Zeng (Tongji University)
A0272: Resilience evaluation and improvement of urban gas system under seismic hazards
Yi-Fan Zeng, Wei Liu

14:45-15:00 | Presenter: Long-Guan Zhang (Beijing University of Technology)
A0062: An interpretable TFFI-1DCNN-LSTM framework for UGW-based pre-stress identification of steel strands
Long-Guan Zhang, Jun-Feng Jia

15:00-15:15 | Presenter: Yi-De Zheng (Tsinghua University)
A0308: Reliability analysis of nonlinear correlation parameters based on copula space
Yi-De Zheng, Yi Zhang

Parallel Session 1 | Friday, April 26, 14:00-15:15
Room 104, Venture Valley
Student Award Selection (II)

organized by The Organization Committee of the ICVRAM-ISUMA-2024

Chair: Bin Pei (Northwestern Polytechnical University), Qing-Xia Yue (Shandong Jianzhu University)

14:00-14:15 | Presenter: Jia-Yi Ding (Southeast University)
A0226: Regional-scale seismic fragility assessment of buildings using probabilistic machine learning
Jia-Yi Ding, Li Feng, De-Cheng Feng

14:15-14:30 | Presenter: Jing-Xuan Zhou (Tongji University)
A0287: A function-based simulation generalized framework to model seismic resilience of interdependent critical infrastructure systems
Wei Liu, Jing-Xuan Zhou

14:30-14:45 | Presenter: Xiu-Bing Huang (Zhejiang University)
A0150: An adaptive nested dynamic wind-field downscaling strategy to support real-time risk forecast of power transmission systems during typhoon evolution
Xiu-Bing Huang, Nai-Yu Wang

14:45-15:00 | Presenter: Mai-Jia Su (University of Trento)
A0253: Optimized corner frequency in stochastic ground motion models
Mai-Jia Su, Mayssa Dabaghi, Marco Broccardo

15:00-15:15 | Presenter: Jia-Jun Zhao (Fuzhou University)
A0317: Time-variant reliability assessment for the bearing capacity of the marine thin-walled steel structures based on random field
Xin-Yi Ye, Jia-Jun Zhao

Parallel Session 2

Parallel Session 2 | Friday, April 26, 15:55-17:15
Conference Hall, 1st Floor, Yifu Building
MS03: Design of Complex Systems and Structures under Uncertainty

organized by Hector A. Jensen (Universidad Técnica Federico Santa María), Jian-Bing Chen (Tongji University), Marcos A. Valdebenito (Technische Universität Dortmund), Di-Xiong Yang (Dalian University of Technology)

Chair: Hector A. Jensen (Universidad Técnica Federico Santa María), Marcos A. Valdebenito (Technische Universität Dortmund), Di-Xiong Yang (Dalian University of Technology)

15:55-16:15 | (Invited Talk) Presenter: Danko J. Jerez (Universidad Técnica Federico Santa María)
A0139: Reliability-based optimal pump scheduling of water distribution networks subject to random user demands
Danko J. Jerez, Hector A. Jensen

16:15-16:30 | Presenter: Max Teichgräber (Technische Universität München)
A0134: On the equivalence of general structural systems and the Daniels system and how this equivalence can be exploit in partial safety factor design
Max Teichgräber, Daniel Straub

16:30-16:45 | Presenter: Di-Xiong Yang (Dalian University of Technology)
A0171: Uncertainty quantification and reliability-based optimum design of structures via a unified and efficient framework
Di-Xiong Yang, Guo-Hai Chen

16:45-17:00 | Presenter: Marcos A. Valdebenito (Technische Universität Dortmund)
A0323: First excursion probability estimation of a bilinear conservative oscillator subject to stochastic Gaussian loading
Mauricio A. Misraji, Xuan-Yi Zhang, Marcos A. Valdebenito, Matthias G.R. Faes

17:00-17:15 | Presenter: Jia-Shu Yang (Xi'an University of Architecture and Technology)
A0350: Reliability-based topology optimization of frame structures under seismic excitations by probability density evolution method
Jia-Shu Yang, Jian-Bing Chen

Parallel Session 2 | Friday, April 26, 15:55-17:30
Meeting Room, 1st Floor, Yifu Building
MS05 (II): Uncertainty Quantification and Structural Reliability

organized by Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Zeng Meng (Hefei University of Technology), Guo-Hai Chen (Dalian University of Technology)

Chair: Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)

15:55-16:15 | (Invited Talk) Presenter: Min-Yu Xiao (Western University)
A0227: Seismic capacity and fragility analysis of transmission tower-line system considering soil-structure interaction effect
Min-Yu Xiao, Wen-Xing Zhou, Han-Ping Hong

16:15-16:30 | (Remote Talk) Presenter: Chao Zhao (China University of Geosciences, Wuhan)
A0170: Coupled characterization of stratigraphic and geo-properties uncertainties with conditional random field theory
Wen-Ping Gong, Chao Zhao, Charng-Hsein Juang

16:30-16:45 | Presenter: Wan-Ying Yun (Northwestern Polytechnical University)
A0182: An efficient Kriging model-based method for analysing the global reliability sensitivity indices
Wan-Ying Yun, Shu-Tong Zhang

16:45-17:00 | Presenter: Xin-Xin Yue (Anhui Science and Technology University)
A0224: Uncertainty quantification of complex structures using PCE-HDMR
Xin-Xin Yue, Jian Zhang, Wen-Jiao Dan

17:00-17:15 | Presenter: Jun-Wen Wang (Dalian University of Technology)
A0102: Probability density integral equation of dynamical system and time-variant mean and variance functions of responses
Di-Xiong Yang, Jun-Wen Wang

17:15-17:30 | Presenter: Ming-Jun Wang (Shanghai Jiao Tong University)
A0123: Dynamic seismic reliability estimation of a 220 kV transformer-bushing systems
Ming-Jun Wang, Ying-Hao Duan, Jun He

Parallel Session 2 | Friday, April 26, 15:55-17:10
Room 113, 1st Floor, Yifu Building

MS18 (II): Dynamic Reliability of Conceptual Dynamical Systems

organized by Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)

Chair: Xiao-Le Yue (Northwestern Polytechnical University), Di Liu (Shanxi University), Yan-Fei Jin (Beijing Institute of Technology), Yong Xu (Northwestern Polytechnical University)

15:55-16:10 | Presenter: Xiao-Long Wang (Shaanxi Normal University)
A0162: Deep learning-based parameter identification of a stochastic airfoil system
Xiao-Long Wang, Yong Xu

16:10-16:25 | Presenter: Ruo-Bing Qin (Northwestern Polytechnical University)
A0172: Response analysis of nonlinear parameter pendulum with bounded noise excitation
Ying Zhang, Ruo-Bing Qin

16:25-16:40 | Presenter: Dan Zhao (Northwestern Polytechnical University)
A0205: Reliability analysis and parameter optimization in a suspended seat system with consideration of extreme ocean environment
Dan Zhao, Yong Xu, Yong-Ge Li

16:40-16:55 | Presenter: Tong Ren (Shanxi University)
A0239: Bayesian inference for parameter estimation in stochastic SDOF systems based on FPK
Di Liu, Tong Ren

16:55-17:10 | Presenter: Jing-Wei Meng (Beijing Institute of Technology)
A0324: Dynamic analysis of flexible multibody systems with imprecise random field
Jing-Wei Meng, Yan-Fei Jin

Parallel Session 2 | Friday, April 26, 15:55-17:15
Lecture Hall, 2nd Floor, Yifu Building
MS22 (II): Wind Hazard Modeling and Structural Fragility Analysis

organized by Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology), Teng Wu (University of Buffalo)

Chair: Gen-Shen Fang (Tongji University), Tian-You Tao (Southeast University), Xu Hong (Hefei University of Technology)

15:55-16:15 | (Invited Talk) Presenter: Da-Hai Wang (Wuhan University of Technology)
A0321: The critical effects of downburst on transmission line system： A close-form-based design wind load provisions
Jie Zhang, Da-Hai Wang

16:15-16:30 | Presenter: Tian-You Tao (Southeast University)
A0158: Physics-informed machine learning for prediction of typhoon wind speeds using locally measured data and meteorological data
Tian-You Tao, Peng Deng, Hao Wang

16:30-16:45 | Presenter: Dong-Lian Gu (University of Science and Technology Beijing)
A0210: Time history analysis of wind-induced building dynamic responses: City-scale computational framework and application
Dong-Lian Gu, Ahsan Kareem, Xin-Zheng Lu

16:45-17:00 | Presenter: Heng-Hao Zhao (Tongji University)
A0277: Tornado probability model and wind speed prediction in China
Heng-Hao Zhao, Jin-Xin Cao, Gen-Shen Fang, Shu-Yang Cao

17:00-17:15 | Presenter: Jia-Hong Li (Chongqing University)

A0206: Fatigue reliability evaluation of vortex-induced vibration for steel tubes with bolted joints in transmission towers
Jia-Hong Li, Tao Wang, Zheng-Liang Li, Da-Gang Lu, Yi-Qiu Tan

Parallel Session 2 | Friday, April 26, 15:55-16:55
C201, Sino-French Center
MS11 (II): Vibration Analysis and Suppression on Nonlinear Structures with Random Loads

organized by Ying Lei (Xiamen University), Zhong-Hua Liu (Xiamen University), Rong-Hua Huan (Zhejiang University), Lin-Cong Chen (Huaqiao University)

Chair: Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)

15:55-16:10 | Presenter: Ye-Yin Xu (Xi'an Jiaotong Univserstiy)
A0078: Nonlinear vibration and stability in a blood pumping system with random disturbance
Xin-Ya Wang, Ye-Yin Xu, Ying-Hou Jiao, Zhao-Bo Chen

16:10-16:25 | Presenter: Dong-Mei Huang (Xidian University)
A0127: Analysis of a galloping energy harvester with V-shape spring structure under Gaussian white noise
Hang Deng, Ji-Min Ye, Dong-Mei Huang

16:25-16:40 | Presenter: Ying Lei (Xiamen University)
A0090: Stochastic optimization of electromagnetic inertial mass dampers in nonlinear hybrid base isolation systems under random seismic excitations
Xiong-Jun Yang, Ying Lei

16:40-16:55 | Presenter: Jian-Feng Zhang (Hohai University)
A0094: Stochastic response of a two-degree-of-freedom vibro-impact energy harvester system subject to Gaussian white noise
Jian-Feng Zhang, Dong-Liang Hu

Parallel Session 2 | Friday, April 26, 15:55-17:30
C301, Sino-French Center
MS14: Machine Learning for Structural Control and Health Monitoring

organized by Pei Pei (Jiangsu University of Science and Technology), Ser-Tong Quek (National University of Singapore), Yong-Bo Peng (Tongji University)

Chair: Pei Pei (Jiangsu University of Science and Technology), Sha Wei (Shanghai University)

15:55-16:15 | (Invited Talk) Presenter: Shi-Xue Liang (Zhejiang Sci-Tech University)
A0285: PSO-SVR based punching shear resistance prediction and reliability assessment of RC slab-column joints without shear reinforcement
Yi-Qing Cai, Shi-Xue Liang, Yuan-Xie Shen, Zheng-Yu Fei

16:15-16:30 | Presenter: De-Bao Chen (Kyoto University)
A0111: Bayesian inference for bridge model parameter estimation utilizing FNO-based surrogate models
De-Bao Chen, Chul-Woo Kim

16:30-16:45 | Presenter: Yi-Kai Zhu (Zhejiang University)
A0169: Probabilistic feature-aided structural anomaly detection based on unsupervised deep learning
Yi-Kai Zhu, Hua-Ping Wan

16:45-17:00 | Presenter: Meng-Ke Ma (Harbin Institute of Technology)
A0199: Nonlinear finite element model updating of civil structures using deep Gaussian process model-based Bayesian optimization algorithm
Meng-Ke Ma, Yong Huang, Hui Li

17:00-17:15 | Presenter: Pei Pei (Jiangsu University of Science and Technology)
A0223: Two-stage enriched multi-objective optimization scheme for fuzzy logic controller-driven structural systems with magnetorheological dampers
Pei Pei, Ser-Tong Quek, Yong-Bo Peng

17:15-17:30 | Presenter: Miguel A. C. Michalski (University of São Paulo)
A0278: Integrating ai for health management in Brazilian hydroelectric power plants
Renan Favarão da Silva, Miguel A. C. Michalski, Arthur H. A. Melani, Gilberto F. M. de Souza

Parallel Session 2 | Friday, April 26, 15:55-17:45
C401b, Sino-French Center

MS24 (II): Uncertainty Modelling and Computational Challenges in Stochastic Dynamics

organized by Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Jian-Bing Chen (Tongji University), Michael Beer (Leibniz Universität Hannover)

Chair: Marco Behrendt (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover)

15:55-16:15 | (Invited Talk) Presenter: Zhi-Qiang Wan (Northwestern Polytechnical University)
A0355: New advances in the Fréchet-derivative-based global sensitivity analysis for parametric stochastic dynamical systems
Zhi-Qiang Wan

16:15-16:30 | Presenter: Marco Behrendt (Leibniz Universität Hannover)
A0053: Failure probability estimation using relaxed power spectral density functions with dependent frequencies
Marco Behrendt, Meng-Ze Lyu, Yi Luo, Jian-Bing Chen, Michael Beer

16:30-16:45 | Presenter: Pei-Hua Ni (National university of Singapore)
A0366: stochastic analysis for nonlinear fractional systems by statistical quandratization method
Pei-Hua Ni, Vasileios C. Fragkoulis, Ioannis P. Mitseas, Fan Kong, Michael Beer,

16:45-17:00 | Presenter: Yan-Ping Liang (Hangzhou City University)
A0160: Two-stage method simulating random fields over manifolds
Yan-Ping Liang, De-Cheng Feng, Xiao-Dan Ren, Jie Li

17:00-17:15 | Presenter: Yang-Yi Liu (Tongji University)
A0306: A novel approach for multivariate Gaussian random field simulation considering nonlinear probabilistic dependencies and multi-spatial variabilities
Yang-Yi Liu, Meng-Ze Lyu, Jian-Bing Chen

17:15-17:30 | Presenter: Si-Long Wang (Northwestern Polytechnical University)
A0207: Global sensitivity analysis of structural reliability in reinforced concrete structures subjected to strong earthquakes
Si-Long Wang, Zi-Yan Wu, Zhi-Qiang Wan

17:30-17:45 | Presenter: Miao Liu (Wuhan Institute of Technology)
A0188: Random modelling of far-field long-period seismic motion by dimension reduction method
Miao Liu, Bo-Hang Xu, Zhang-Jun Liu

Parallel Session 2 | Friday, April 26, 15:55-17:10
A401, Sino-French Center
Student Award Selection (III)

organized by The Organization Committee of the ICVRAM-ISUMA-2024

Chair: You Dong (The Hong Kong Polytechnic University), Zhen-Hao Zhang (Changsha University of Science and Technology)

15:55-16:10 | Presenter: Tian-Yang Wang (Kansai University)
A0135: Using deep learning techniques extraction of steep slope warning areas
Michiyuki Hirokane, Rena Tani, Tian-Yang Wang, Kazumasa Kuramoto

16:10-16:25 | Presenter: Hui-Ming Chen (Tongji University)
A0276: Resilience assessment and evaluation of water supply system under coupling effects of seismic and geological hazards
Wei Liu, Hui-Ming Chen

16:25-16:40 | Presenter: Jia-Jun Zhou (Southeast University)
A0349: Parameter estimation of isolation structures using unscented Kalman filter with covariance adjustment
Jia-Jun Zhou, Dan Li, Xin-Hao He

16:40-16:55 | Presenter: Mauricio Misraji (Technische Universität Dortmund)
A0269: First excursion probability sensitivity by means of multidomain line sampling
Mauricio A. Misraji, Marcos A. Valdebenito, Danko J. Jerez, Héctor A. Jensen, Michael Beer, Matthias G. R. Faes

16:55-17:10 | Presenter: Peng-Fei Ma (Tsinghua University)
A0268: Applying a time-varying copula approach to analyze seasonal dynamics loads in multivariate ocean data for offshore structures
Peng-Fei Ma, Yi Zhang

Parallel Session 2 | Friday, April 26, 15:55-17:10
Room 104, Venture Valley
Student Award Selection (IV)

organized by The Organization Committee of the ICVRAM-ISUMA-2024

Chair: Shao-Juan Ma (North Minzu University), Zhi-Qiang Wu (Tianjin University)

15:55-16:10 | Presenter: Xi Zhong (The Hong Kong University of Science and Technology)
A0096: Physics-based tropical cyclone track and intensity models via data-driven sparse identification of nonlinear dynamics
Xi Zhong, Ji-Ze Zhang

16:10-16:25 | Presenter: Yi-Jian Xu (Hefei University of Technology)
A0334: Analytical solution for non-stationary response of systems endowed with fractional derivatives of arbitrary-order under stochastic excitation
Fan Kong, Yi-Jian Xu

16:25-16:40 | Presenter: Zi-Hang Liu (Tongji University)
A0093: Determination of performance-based checking wind speed for long-span bridges using uniform-risk-targeted algorithm
Zi-Hang Liu, Gen-Shen Fang, Yao-Jun Ge

16:40-16:55 | Presenter: Yue Cheng (Tongji University)
A0124: Typhoon-induced fragility analysis of wind turbines based on stochastic typhoon simulations
Yue Cheng, Gen-Shen Fang, Lin Zhao, Yao-Jun Ge

16:55-17:10 | Presenter: Meng-Lan Yang (Huazhong University of Science and Technology)
A0298: National transport system resilience to tropical cyclones in a changing climate
Hui Zhang, Min Ouyang, Meng-Lan Yang

Parallel Session 3

Parallel Session 3 | Saturday, April 27, 08:30-09:45
Conference Hall, 1st Floor, Yifu Building
MS16 (I): Advances in Uncertainty Quantification and Propagation in Earthquake Engineering

organized by Jun Xu (Hunan University), Katsu Goda (Western University), Zhao Yang (Wuhan University of Science and Technology)

Chair: Jun Xu (Hunan University), Zhao Yang (Wuhan University of Science and Technology), Zhang-Jun Liu (Wuhan Institute of Technology)

08:30-08:45 | Presenter: Ke Chen (Yanshan University)
A0238: A method based generalized harmonic wavelets for simulating nonstationary random processes
Ke Chen, Fei-Xiang Yu, Ding Wang

08:45-09:00 | Presenter: Li-Bo Chen (Fuzhou University)
A0057: Investigation on intraclass correlation of seismic capacity for RC bridge piers based on hierarchical model
Li-Bo Chen, Ru-Chun Mo

09:00-09:15 | Presenter: Qing-Xia Lv (Wuhan Institute of Technology)
A0189: A novel earthquake model using random phase difference spectra
Qing-Xia Lv, Ye Zhou, Xin Gao, Zhang-Jun Liu

09:15-09:30 | Presenter: Yuan Gao (Northwestern Polytechnical University)
A0220: Improvements to the generalized distribution reconstruction method for structural reliability analysis
Yuan Gao, Zhi-Qiang Wan

09:30-09:45 | Presenter: Quan-Fu Yu (Hunan University)
A0248: Seismic reliability analysis of structures based on harmonic transform density estimation method
Jun Xu, Quan-Fu Yu

Parallel Session 3 | Saturday, April 27, 08:30-10:05
Meeting Room, 1st Floor, Yifu Building
MS05 (III): Uncertainty Quantification and Structural Reliability

organized by Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Zeng Meng (Hefei University of Technology), Guo-Hai Chen (Dalian University of Technology)

Chair: Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)

08:30-08:50 | (Invited Talk) Presenter: Hong-Wei Huang (Tongji University)
A0215: Deep learning based soil classification from cone penetration tests data
Hong-Wei Huang, Jin-Zhang Zhang

08:50-09:05 | Presenter: Xue-Yi Liu (Shanghai Jiao Tong University)
A0245: A probabilistically dual neural network based theoretical framework for detection of infrastructure damage
Xue-Yi Liu, Lin-Feng Li, Yue Pan, Jian-Jun Qin

09:05-09:20 | Presenter: Heng Zhang (Yangtze University)
A0260: Static homotopy response analysis of structure with random parameters of arbitrary distributions by minimizing stochastic residual error
Xu Xiang, Heng Zhang, Zhi-Feng Wu, Bin Huang

09:20-09:35 | Presenter: Yuan-Zhuo Ma (Hohai University)
A0264: Robust design optimization of a multi-body system with aleatory and epistemic uncertainty
Yuan-Zhuo Ma, Chen-Xu Li, You-Yu Wang, Zhi-Yong Zhang, Hong-Shuang Li, A-Nai Ding

09:35-09:50 | Presenter: Ci-Hang Ma (Wuhan University of technology)
A0265: Dynamic response analysis of nonlinear structures with random parameters based on the stochastic perturbation-Galerkin method
Ci-Hang Ma, Yun-Chong Chen, Zhi-Feng Wu, Bin Huang

09:50-10:05 | Presenter: Tong Wang (Harbin Institute of Technology)
A0295: Seismic fragility assessment of a large-span steel truss arch bridge under construction
Tong Wang, Yi-Dian Dong, Qing-Fei Gao, Yang Liu

Parallel Session 3 | Saturday, April 27, 08:30-10:05
Room 113, 1st Floor, Yifu Building
MS06 (I): Reliability Design Analysis and Optimization of Structures and Critical Infrastructures

organized by Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland), Enrico Zio (Politecnico di Milano)

Chair: Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)

08:30-08:50 | (Invited Talk) Presenter: De-Cheng Feng (Southeast University)
A0226: Regional-scale seismic fragility assessment of building portfolios by Poisson binomial distribution
Jia-Yi Ding, Li Feng, De-Cheng Feng

08:50-09:05 | Presenter: Matteo Broggi (Leibniz Universität Hannover)
A0328: Concept of diagonal approximated signature: Surrogate modeling approach for the reliability analysis of discrete and continuous multi-state systems
Niklas R. Winnewisser, Yan Shi, Matteo Broggi, Michael Beer

09:05-09:20 | Presenter: Jing-Ran He (Guangdong University of Technology)
A0364: Data-physical driven framework for stochastic modelling of concrete material properties in reinforced concrete structures
Jing-Ran He

09:20-09:35 | Presenter: Chong-Qing Fan (Xi'an University of Architecture and Technology)
A0357: Advanced method for time-dependent reliability-based design optimization
Chong-Qing Fan

09:35-09:50 | Presenter: Meng-Ze Lyu (Tongji University)
A0331: Physics-driven dimension-reduced probability density evolution equation for dynamic reliability analysis of complex structures
Meng-Ze Lyu, Jian-Bing Chen

09:50-10:05 | Presenter: Xin Chen (Tongji University)
A0288: Static reliability analysis of structural members via stochastic finite element method
Xin Chen, Jie Li

Parallel Session 3 | Saturday, April 27, 08:30-09:45
Lecture Hall, 2nd Floor, Yifu Building
MS09 (I): Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions

organized by Jie Zhang (Tongji University), Takayuki Shuku (Okayama University)

Chair: Jie Zhang (Tongji University), Ding Wang (Yanshan University)

08:30-08:45 | Presenter: Lin-Feng Li (Shanghai Jiao Tong University)
A0125: Discussions on Peck formula in predicting the settlement of the buildings adjacent to deep excavation
Lin-Feng Li, Yue Pan, Jian-Jun Qin

08:45-09:00 | Presenter: Ping Yi (Dalian University of technology)
A0200: Probabilistic failure envelopes of caisson foundations based on non-stationary random field model
Ping Yi, Jun Liu, Xin-Shuai Guo

09:00-09:15 | Presenter: Atma Sharma (Tongji University)
A0204: Bayesian probabilistic site characterization using multivariate, limited, and missing data
Atma Sharma, Jie Zhang

09:15-09:30 | Presenter: De-Yun Liu (The Hong Kong University of Science and Technology)
A0301: Stochastic discrete element method for capturing the full spectrum of random mechanical behaviour in granular materials
De-Yun Liu, Meng-Ze Lyu

09:30-09:45 | Presenter: Akihiro Shioi (Kozo Keikaku Engineering Inc.)
A0236: Time series analysis of seismic ground response via dynamic mode decomposition with time-delay embedding
Akihiro Shioi, Yu Otake

Parallel Session 3 | Saturday, April 27, 08:30-09:35
C201, Sino-French Center
MS11 (III): Vibration Analysis and Suppression on Nonlinear Structures with Random Loads

organized by Ying Lei (Xiamen University), Zhong-Hua Liu (Xiamen University), Rong-Hua Huan (Zhejiang University), Lin-Cong Chen (Huaqiao University)

Chair: Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)

08:30-08:50 | (Invited Talk) Presenter: Qiu-Bao Wang (Shijiazhuang Tiedao University)
A0081: Effective dynamics extraction based on stochastic center manifold
Qiu-Bao Wang, Zhong Liu, Xi-Yuan Chen

08:50-09:05 | Presenter: Yan-Ming Liang (Tiangong University)
A0133: Using reservoir computing to solve FPK equations for stochastic dynamical systems under Gaussian or non-Gaussian excitation
Yan-Ming Liang, Yong-Feng Guo, Zi-Fei Lin

09:05-09:20 | Presenter: Haylim Chha (Tongji University)
A0147: Multiscale stochastic optimal control strategy of hysteretic structures subjected to stochastic ground motions
Haylim Chha, Yong-Bo Peng

09:20-09:35 | Presenter: Nan-Nan Zhao (Chang'an University)
A0114: Oscillation suppression in multiplex networks with random interactions
Nan-Nan Zhao, Zhong-Kui Sun

Parallel Session 3 | Saturday, April 27, 08:30-09:30
C301, Sino-French Center
MS25 (II): Multi-Dimension Resilience Enhancement for Urban Critical Infrastructure Systems

organized by Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)

Chair: Wei Liu (Tongji University), Min Ouyang (Huazhong University of Science and Technology), Nai-Yu Wang (Zhejiang University)

08:30-08:45 | (Remote Talk) Presenter: Wan-Ting Wang (Colorado State University)
A0230: Community resilience enhancement for tornadoes considering socio-economic equity
Wan-Ting Wang, John W. van de Lindt

08:45-09:00 | Presenter: Hussam Mahmoud (Colorado State University)
A0231: Resilience of coastal communities under a changing climate
Mohamed A. Abdelhafez, Hussam Mahmoud, Bruce Ellingwood

09:00-09:15 | Presenter: Da-Hai Wang (Wuhan Universtiy of Technology)
A0106: Reliability assessment of tower-line system subjected to typhoon events
Da-Hai Wang, Zheng-Yuan Ma

09:15-09:30 | Presenter: Chen-Xi Mao (Institute of Engineering Mechanics, CEA)
A0217: Shaking table test on seismic performance of the communication pole-line system considering the interaction between soil and the poles
Zhi-Tao Zhang, Tao Wang, Chen-Xi Mao

Parallel Session 3 | Saturday, April 27, 08:30-09:50
C401b, Sino-French Center
MS17 (I): Data-Driven and Hybrid Approaches for Risk and Resilience Analysis of Infrastructure

organized by Kao-Shan Dai (Sichuan University), Tso-Chien Pan (Nanyang Technology University), Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)

Chair: Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)

08:30-08:50 | (Invited Talk) Presenter: Xiao-Hong Long (Huazhong University of Science and Technology)
A0120: Rapid seismic response prediction model of bridges with small-sample data based on cluster analysis and Transformer methods
Chun-De Lu, Xiao-Hong Long, Xiao-Peng Gu, Yong-Tao Ma, Shi-Hai Gui

08:50-09:05 | (Remote Talk) Presenter: Cao Wang (University of Wollongong)
A0117: A generalized resilience measure that reflects sensitivity to performance function
Cao Wang

09:05-09:20 | Presenter: Tao Zheng (Sichuan University)
A0105: AI-boosted prognostic digital twins for super-tall hybrid wind turbine towers
Tao Zheng, Yu-Xiao Luo, Jun-Lin Heng, Jian-Ze Wang, Sakdirat Kaewunruen, Kao-Shan Dai, Charalampos Baniotopoulos

09:20-09:35 | Presenter: Henry V. Burton (University of California Los Angeles)
A0196: Leveraging automation and machine learning to perform high-fidelity regional seismic risk and resilience assessment
Laxman Dahal, Henry V. Burton, Kuan-Shi Zhong

09:35-09:50 | Presenter: Yu-Song Cheng (Sichuan University)
A0110: Response-history prediction of offshore wind turbine under wind-wave actions based on LSTM
Yu-Song Cheng, Jian-Ze Wang, Kao-Shan Dai, Ashraf El Damatty

Parallel Session 3 | Saturday, April 27, 08:30-09:50
A401, Sino-French Center
MS13 (I): AI for Uncertainty Quantification

organized by Tong Zhou (Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Yong-Bo Peng (Tongji University), Michael Beer (Leibniz Universität Hannover), Bruno Sudret (ETH Zürich), Enrico Zio (Politecnico di Milano)

Chair: Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)

08:30-08:50 | (Invited Talk) Presenter: Hong-Yuan Guo (Hong Kong Polytechnic University)
A0161: Time-dependent reliability analysis informed by physics and point-evolution kernel density
Hong-Yuan Guo, Jia-Xin Zhang, You Dong

08:50-09:05 | Presenter: Bo-Wen Zheng (Tongji University)
A0129: An efficient calculation method for reliability based on intelligent classification algorithms
Bo-Wen Zheng, Pei-Zhen Li

09:05-09:20 | Presenter: Xiao-Peng Gu (Huazhong University of Science and Technology)
A0142: Selection of the structural severest design ground motion based on big data and random forest
Xiao-Peng Gu, Xiao-Hong Long, Chun-De Lu, Yong-Tao Ma, Zong-Lin Li

09:20-09:35 | Presenter: Zi-Dong Xu (Southeast University)
A0164: Solving probability density evolution equations via physics informed neural network
Zi-Dong Xu, Hao Wang

09:35-09:50 | Presenter: Tian-Yu Wang (Shanghai Institute of Technology)
A0257: Data-driven seismic reliability analysis of nonlinear structural systems using Bayesian neural network
Tian-Yu Wang, Mohammad Noori

Parallel Session 3 | Saturday, April 27, 08:30-09:45
Room 104, Venture Valley
MS04 (I): Probabilistic Seismic Hazard, Vulnerability Analysis and Earthquake Catastrophe Risk Modeling of Modern Cities

organized by Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University), Wen-Qi Du (Wuhan University)

Chair: Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University)

08:30-08:45 | Presenter: Zhou Zhou (Beijing University of Civil Engineering and Architecture)
A0049: Vector-valued seismic hazard analysis considering both mainshock and aftershock
Zhou Zhou, Xiao-Hui Yu, Miao Han, Kun Ji, Da-Gang Lu

08:45-09:00 | Presenter: Xiao-Ying Pan (Tongji University)
A0092: Vulnerability analysis of concrete silos with different storage conditions
Xiao-Ying Pan, Pei-Zhen Li, Jin-Ping Yang

09:00-09:15 | Presenter: Ying-Hao Duan (Shanghai Jiao Tong University)
A0113: Building earthquake evacuation risk assessment: methodology and case study
Ying-Hao Duan, Ming-Jun Wang, Jun He

09:15-09:30 | Presenter: Xu Chen (Tongji University)
A0183: Repair procedure-based recovery pattern for estimating seismic resilience: Case study for a highway bridge
Xu Chen, Zhong-Guo Guan, Jian-Zhong Li

09:30-09:45 | Presenter: Xu-Yang Cao (Hohai University)
A0219: A fully non-parametric probabilistic seismic risk assessment framework of structures via the kernel density estimation theory
Xu-Yang Cao, De-Cheng Feng

Parallel Session 3 | Saturday, April 27, 08:30-09:50
Room 103, Venture Valley
MS01: Coping with Imprecision in Structural Reliability Analysis

organized by Matthias G. R. Faes (Technische Universität Dortmund), Jing-Wen Song (Northwestern Polytechnical University), Marcos A. Valdebenito (Technische Universität Dortmund), Peng-Fei Wei (Northwestern Polytechnical University), Xiu-Kai Yuan (Xiamen University)

Chair: Matthias G. R. Faes (Technische Universität Dortmund), Marcos A. Valdebenito (Technische Universität Dortmund), Peng-Fei Wei (Northwestern Polytechnical University), Xiu-Kai Yuan (Xiamen University)

08:30-08:50 | (Invited Talk) Presenter: Xiu-Kai Yuan (Xiamen University)
A0292: Imprecise reliability analysis based on adaptive strategy and combination algorithm
Xiu-Kai Yuan, Yun-Fei Shu, Wei-Ming Zheng, Yi-Wei Dong

08:50-09:05 | Presenter: Fang-Qi Hong (Northwestern Polytechnical University)
A0100: Extension of collaborative and adaptive Bayesian optimization under hybrid uncertainties for rare reliability analysis
Fang-Qi Hong, Peng-Fei Wei

09:05-09:20 | Presenter: Giada Colella (BMW Group)
A0136: Exploration of transfer learning, co-Kriging, and control variates for early-phase crashworthiness analysis
Giada Colella, Jean-Marc Bourinet, Marcos A. Valdebenito, Matthias G. R. Faes, Volker A. Lange, Fabian Duddeck

09:20-09:35 | Presenter: He Yao (Shijiazhuang Tiedao University)
A0185: Reliability assessment of rush-repair elevated railway floating bridge based on active control
He Yao, Cun-Bao Zhao, Fei Wang

09:35-09:50 | Presenter: Chang-Cong Zhou (Northwestern Polytechnical University)
A0193: State analysis of time-dependent systems with interval uncertainties
Qi Chang, Rong-Yao Song, Hao-Dong Zhao, Chang-Cong Zhou

Parallel Session 3 | Saturday, April 27, 08:30-09:45
Room 201, Venture Valley
MS08: Seismic Fragility Analysis and Performance Assessment of Underground Infrastructure under Uncertainties

organized by Zi-Lan Zhong (Beijing University of Technology), Zhen Cui (Chinese Academy of Sciences), M. Hesham El Naggar (Western University)

Chair: Zi-Lan Zhong (Beijing University of Technology), Zhen Cui (Chinese Academy of Sciences), M. Hesham El Naggar (Western University)

08:30-08:45 | Presenter: Jun-Yan Han (Beijing University of Technology)
A0173: Influence of pulse-like ground motions on seismic fragility of pipeline
Jun-Yan Han, A. Kang, Xiao-Qiang Wang, M. Hesham El Naggar, Cheng-Shun Xu

08:45-09:00 | Presenter: Hai-Yang Zhuang (East China JiaoTong University)
A0187: Seismic performance level of subway underground station structures
Hai-Yang Zhuang, Jing Yang

09:00-09:15 | Presenter: Zhi-Yi Chen (Tongji University)
A0198: Fragility analysis of subway stations based on probability density evolution method and deep learning techniques
Zhi-Yi Chen, Peng-Fei Huang, Han-Bin Ge

09:15-09:30 | Presenter: Zi-Lan Zhong (Beijing University of Technology)
A0203: Optimization of seismic intensity measures and fragility analysis of subway station structures based on fully connected neural network
Zi-Lan Zhong, Bo Ni, Yue-Bo Shi, Jia-Xu Shen, Xiu-Li Du

09:30-09:45 | Presenter: Chao Feng (Harbin Institute of Technology Shenzhen)
A0222: Evaluating soil amplification factor at sites in mainland China
Chao Feng, Han-Ping Hong

Parallel Session 4

Parallel Session 4 | Saturday, April 27, 10:25-11:25

Conference Hall, 1st Floor, Yifu Building

MS16 (II): Advances in Uncertainty Quantification and Propagation in Earthquake Engineering

organized by Jun Xu (Hunan University), Katsu Goda (Western University), Zhao Yang (Wuhan University of Science and Technology)

Chair: Jun Xu (Hunan University), Zhao Yang (Wuhan University of Science and Technology), Zhang-Jun Liu (Wuhan Institute of Technology)

10:25-10:40 | Presenter: Yang Zhang (Hunan University)
A0250: A partial decomposition cutting method for points selection in stochastic seismic response analysis of structures
Yang Zhang, Jun Xu

10:40-10:55 | Presenter: Jun Xu (Hunan University)
A0251: Fragility and resilience impacts of multi-point excitation with non-Gaussian characteristics on long-span cable-stayed bridges
Yu-Cong Lan, Jun Xu

10:55-11:10 | Presenter: Xin-Xin Ruan (Xinyang Normal University)
A0333: Simulation of multi-component seismic ground motion field: a novel vector stochastic wave model
Xin-Xin Ruan, Zhang-Jun Liu

11:10-11:25 | Presenter: Zi-Xin Liu (Institute of Disaster Prevention)
A0347: Dimension-reduction modelling of near-fault ground motion process considering slip effect
Zi-Xin Liu, Zhang-Jun Liu

Parallel Session 4 | Saturday, April 27, 10:25-12:00

Meeting Room, 1st Floor, Yifu Building

MS05 (IV): Uncertainty Quantification and Structural Reliability

organized by Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Zeng Meng (Hefei University of Technology), Guo-Hai Chen (Dalian University of Technology)

Chair: Di-Xiong Yang (Dalian University of Technology), Yi Zhang (Tsinghua University), Guo-Hai Chen (Dalian University of Technology)

10:25-10:45 | (Invited Talk) Presenter: Di-Xiong Yang (Dalian University of Technology)
A0356: Unified theory framework for uncertainty quantification
Di-Xiong Yang, Guo-Hai Chen, Zhen-Zeng Lei

10:45-11:00 | Presenter: Long Li (University of Macau)
A0296: Bayesian sparse grid (BSG) approach for information salvage in reliability assessment
Long Li, Sin-Chi Kuok, Ka-Veng Yuen

11:00-11:15 | Presenter: Ye-Zhou Wang (Southwest Jiaotong University)
A0314: Structural dynamic reliability analysis based on probability density evolution method and GPDEE-informed adaptive mesh refinement
Ye-Zhou Wang, Zi-Jun Cao, Ping Wang, Rong Chen

11:15-11:30 | Presenter: Xin-Yi Ye (Fuzhou University)
A0316: Durability conformity control method based on dual-parameter fusion
Xin-Yi Ye, Hui-Fang Fu

11:30-11:45 | Presenter: Kai Cheng (Technische Universität München)
A0370: Sequential directional importance sampling for structural reliability analysis of complex systems
Kai Cheng, Iason Papaioannou, Daniel Straub

11:45-12:00 | Presenter: Meng-Ze Lyu (Tongji University)
A0325: Decoupled multi-probability density evolution method for determination of probabilistic dependent responses
Meng-Ze Lyu, De-Cheng Feng, Jian-Bing Chen

Parallel Session 4 | Saturday, April 27, 10:25-12:00
Room 113, 1st Floor, Yifu Building
MS06 (II): Reliability Design Analysis and Optimization of Structures and Critical Infrastructures

organized by Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland), Enrico Zio (Politecnico di Milano)

Chair: Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)

10:25-10:45 | (Invited Talk) Presenter: Jia-Shu Yang (Xi'an University of Architecture and Technology)
A0252: Dynamic-reliability-based design optimization via probability density evolution method and efficient information reuse strategy
Jia-Shu Yang, Zhi-Qiang Wan

10:45-11:00 | (Remote Talk) Presenter: Dshamil D. Efinger (Universität Stuttgart)
A0304: Load-optimized functional availability of safe adaptive load-bearing structures
Dshamil D. Efinger, Martin Dazer

11:00-11:15 | Presenter: Chang-Ting Zhong (Hainan University)
A0279: Starfish optimization algorithm: A novel metaheuristic for global optimization
Chang-Ting Zhong, Gang Li, Zeng Meng, Hai-Jiang Li, Ali Riza Yildiz, Seyedali Mirjalili

11:15-11:30 | Presenter: Yan Shi (Leibniz Universität Hannover)
A0108: Time-variant reliability-based design optimization of structures with hybrid uncertainties
Yan Shi, Michael Beer

11:30-11:45 | Presenter: Dong Xiang (Tongji University)
A0098: Stochastic nonlinear analysis of RC columns based on a convergence-enhanced Timoshenko beam element
Dong Xiang, Xiang-Ling Gao

11:45-12:00 | Presenter: Jun Lai (Southwest Jiaotong University)
A0291: Adaptive surrogate model-based optimization framework applied to rail profile for sharp curves of metro line
Jun Lai, Tao Liao, Yan Shi, Jing-Mang Xu, Ping Wang, Michael Beer

Parallel Session 4 | Saturday, April 27, 10:25-11:40
Lecture Hall, 2nd Floor, Yifu Building
MS09 (II): Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions

organized by Jie Zhang (Tongji University), Takayuki Shuku (Okayama University)

Chair: Jie Zhang (Tongji University), Zi-Jun Cao (Southwest Jiaotong University)

10:25-10:40 | Presenter: Hong-Peng Hu (Nanchang University)
A0237: High-dimensional Bayesian inverse analysis of material parameters using PCA-based bus approach
Hong-Peng Hu, Shui-Hua Jiang

10:40-10:55 | Presenter: Xuan-Hao Wang (Wuhan University)
A0242: Comparative study of trans-dimensional Bayesian inversion for shear wave velocity profiles based on dispersion curves using reversible jump Markov chain Monte Carlo and bus
Xuan-Hao Wang, Zi-Jun Cao, Wen-Qi Du

10:55-11:10 | Presenter: Chen-Guang Wu (Tongji University)
A0342: Failure probability of road networks under rainfall-induced landslides
Chen-Guang Wu, Xue-Shan Li, Jie Zhang

11:10-11:25 | Presenter: Lian-Yu Zhang (Southwest Jiaotong University)
A0271: Efficient system reliability analysis of gravity dams with Kriging-based surrogate model and generalized subset simulation
Lian-Yu Zhang, Ge Yang, Yu-Fu Ma, Zi-Jun Cao

11:25-11:40 | Presenter: Meng-Lu Huang (Okayama University)
A0281: A novel data-driven 3D site characterization method: Tucker decomposition-Bayesian compressive sensing and benchmarking study
Meng-Lu Huang, Takayuki Shuku, Toshifumi Shibata, Shinichi Nishimura

Parallel Session 4 | Saturday, April 27, 10:25-11:45
C201, Sino-French Center
MS11 (IV): Vibration Analysis and Suppression on Nonlinear Structures with Random Loads

organized by Ying Lei (Xiamen University), Zhong-Hua Liu (Xiamen University), Rong-Hua Huan (Zhejiang University), Lin-Cong Chen (Huaqiao University)

Chair: Ying Lei (Xiamen University), Rong-Hua Huan (Zhejiang University)

10:25-10:45 | (Invited Talk) Presenter: Siu-Siu Guo (Xi'an University of Architecture and Technology)
A0071: The generalized EPC method for the non-stationary probabilistic response of nonlinear dynamical system
Siu-Siu Guo, Fei-Fan Meng

10:45-11:00 | Presenter: Xu-Dong Gu (Northwestern Polytechnical University)
A0213: Dynamical analysis of a stochastically excited nonlinear beam with viscoelastic constitution
Xu-Dong Gu, Shuai Li, Zi-Chen Deng

11:00-11:15 | Presenter: Yu-Hang Wang (Northwestern Polytechnical University)
A0218: Dynamic modeling and analyse of Hose-Paradrogue system
Yu-Hang Wang, Hai-Bo Wan, Xue-Feng Wang, Xu-Dong Gu

11:15-11:30 | Presenter: Qiang-Feng Lyu (Zhejiang University)
A0262: Response of MDOF nonlinear system with fractional derivative damping and driven by fractional Gaussian noise
Qiang-Feng Lyu

11:30-11:45 | Presenter: Qiu-Bao Wang (Shijiazhuang Tiedao University)
A0080: Enhancing structural resilience: Novel strategies for nonlinear vibration suppression under random loads
Qiu-Bao Wang, Xi-Yuan Chen, Zhong Liu

Parallel Session 4 | Saturday, April 27, 10:25-11:45
C301, Sino-French Center
MS23 (I): Resilience and Sustainability Informed Integrity Management of Infrastructure Systems

organized by Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Jian-Jun Qin (Shanghai Jiao Tong University), Min Liu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)

Chair: Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)

10:25-10:45 | (Invited Talk) Presenter: Ze-Yu Wang (China University of Geosciences, Beijing)

A0089: A digital twin-based approach for uncertainty quantification in structures and infrastructural systems

Ze-Yu Wang

10:45-11:00 | Presenter: Zhao-Ming Yang (China University of Petroleum, Beijing)

A0055: Research on assessment method of natural gas supply system (NGPS) resilience

Zhao-Ming Yang, Huai Su, Zio Enrico, Michael H. Faber, Jin-Jun Zhang

11:00-11:15 | Presenter: Wen-Gu Yin (Shenyang Jianzhu University)

A0166: Seismic fragility analysis of RC tall piers considering structural multiple-bends damage pattern

Yang Liu, Wen-Gu Yin, Zhu Mei, Kai Jin, Xiao-Lei Wang

11:15-11:30 | Presenter: Wei-Kang Zhou (Wenzhou University)

A0168: Integrated fragility estimation of typical floating wind turbine under joint typhoon-wave loading

Yang Liu, Wei-Kang Zhou, Zhu Mei, Hai-Bo Shen

11:30-11:45 | Presenter: Si-Si Peng (Chongqing University)

A0229: Risk-informed robustness and resilience assessment framework for power transmission line systems

Si-Si Peng, Tao Wang, Min Liu, Da-Gang Lu, Jian-Jun Qin, Zheng-Liang Li, Michael H. Faber

Parallel Session 4 | Saturday, April 27, 10:25-11:45

C401b, Sino-French Center

MS17 (II): Data-Driven and Hybrid Approaches for Risk and Resilience Analysis of Infrastructure

organized by Kao-Shan Dai (Sichuan University), Tso-Chien Pan (Nanyang Technology University), Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)

Chair: Henry V. Burton (University of California Los Angeles), Jian-Ze Wang (Sichuan University)

10:25-10:45 | (Invited Talk) Presenter: De-Mi Ai (Huazhong University of Science and Technology)

A0140: Deep learning of electromechanical impedance for concrete structural damage identification using convolutional neural networks

De-Mi Ai

10:45-11:00 | Presenter: Ji-Ze Zhang (The Hong Kong University of Science and Technology)
A0181: Sparse reduced-order modeling for nonlinear time-history analysis of high-rise building
Han Peng, Ji-Ze Zhang, Sheng-Han Zhang

11:00-11:15 | Presenter: Qin-Yong Huang (Sichuan University)
A0176: A data-driven approach based on FEMA P-58 for evaluating the earthquake risk in urban buildings
Qin-Yong Huang, Jian-Ze Wang, Kao-Shan Dai

11:15-11:30 | Presenter: Yong-Chuan Yang (Zhejiang University)
A0225: Typhoon-induced power outage prediction for distribution transformers: A two-stage data-driven framework
Yong-Chuan Yang, Nai-Yu Wang, Xiu-Bing Huang

11:30-11:45 | Presenter: Yong-Qing Jiang (Sichuan University)
A0235: A data-driven approach for estimating peak floor response based on damage of non-structural components
Yong-Qing Jiang, Jian-Ze Wang, Xiong-Lei Yang, Kao-Shan Dai

Parallel Session 4 | Saturday, April 27, 10:25-11:45
A401, Sino-French Center
MS13 (II): AI for Uncertainty Quantification

organized by Tong Zhou (Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Yong-Bo Peng (Tongji University), Michael Beer (Leibniz Universität Hannover), Bruno Sudret (ETH Zürich), Enrico Zio (Politecnico di Milano)

Chair: Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)

10:25-10:45 | (Invited Talk) Presenter: Marco Broccardo (University of Trento)
A0244: Pool-based maximin distance design of experiment for surrogate-based uncertainty quantification
Mai-Jia Su, Zi-Qi Wang, Marco Broccardo

10:45-11:00 | Presenter: Zhi-Feng Wu (Wuhan University of Technology)
A0267: Static homotopy stochastic model updating with correlated measurement data
Zhi-Feng Wu, Bin Huang, Kai-Yi Xue, Ming Sun, Hui Chen

11:00-11:15 | Presenter: Si-Feng Bi (University of Strathclyde)
A0274: Data-driven stochastic damage identification with conditional invertible neural network (cINN)
Tai-Ran Wang, Si-Feng Bi

11:15-11:30 | Presenter: Chao Dang (Technische Universität Dortmund)
A0360: Bayesian active learning methods for structural reliability analysis
Chao Dang

11:30-11:45 | Presenter: Tong Zhou (Hong Kong Polytechnic University)
A0266: Structural reliability analysis based on one-step look-ahead policy
Tong Zhou, You Dong

Parallel Session 4 | Saturday, April 27, 10:25-11:40
Room 104, Venture Valley
MS04 (II): Probabilistic Seismic Hazard, Vulnerability Analysis and Earthquake Catastrophe Risk Modeling of Modern Cities

organized by Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University), Wen-Qi Du (Wuhan University)

Chair: Chao-Lie Ning (Tongji University), Xiao-Hui Yu (Guilin University of Technology), Kun Ji (Hohai University)

10:25-10:40 | Presenter: Kun Ji (Hohai University)
A0261: Evaluation of vector hazard consistency for conditional target spectrum
Kun Ji, Xiao-Hui Yu, Ye-Fei Ren, Rui-Zhi Wen

10:40-10:55 | Presenter: Zi-Han He (Harbin Institute of Technology)
A0263: A simplified approach of analytical seismic fragility analysis using the endurance time method
Zi-Han He, Xiao-Hui Yu

10:55-11:10 | Presenter: Yun-Xing Feng (Harbin Institute of Technology)
A0290: Analysis of the correlation between nonstructural and structural elements through modified fragility curves
Yun-Xing Feng, Da-Dang Lu

11:10-11:25 | Presenter: Meng Wang (Tongji University)
A0345: Examination of Uncertainty Propagation from Probabilistic Seismic Hazard Analysis to Seismic Fragility Analysis of Building Structures
Meng Wang, Xiang-Ling Gao, Chao-Lie Ning

11:25-11:40 | Presenter: Zheng Liu (Beijing University of Technology)
A0352: An efficient conversion model from pseudo velocity response spectrum to velocity response spectrum
Zheng Liu, Yan-Gang Zhao, Hai-Zhong Zhang

Parallel Session 4 | Saturday, April 27, 10:25-12:20
Room 103, Venture Valley
MS10: Robustness Design and Quantification for New and Existing Structures against Disproportional Collapse

organized by Robby Caspeele (Ghent University), Jian-Bing Chen (Tongji University), De-Cheng Feng (Southeast University), Lu-Chuan Ding (Tongji University)

Chair: Robby Caspeele (Ghent University), De-Cheng Feng (Southeast University), Lu-Chuan Ding (Tongji University)

10:25-10:45 | (Invited Talk) Presenter: Robby Caspeele (Ghent University)
A0336: Reliability of fire exposed concrete hollow core slabs, taking into account restrained thermal expansion
Thomas Thienpont, Wouter De Corte, Ruben Van Coile, Robby Caspeele

10:45-11:05 | (Invited Talk) Presenter: Xiao-Hui Yu (Guilin University of Technology)
A0367: Progressive collapse assessment of RC frame structures: Examining the effects of corrosion and uncertainty
Xiao-Hui Yu, Kai Qian, Da-Gang Lu, Bing Li

11:05-11:20 | Presenter: Hao Zhou (South China University of Technology)
A0146: Damage and progressive collapse analysis of reinforced concrete structures under localized fires
Hao Zhou, Xiu-Quan Tian

11:20-11:35 | Presenter: Yi-Hua Zeng (Southeast University)
A0286: A reliability analysis of precast concrete plane frame with kinked rebars and unbonded strand under a central column removal scenario
Yi-Hua Zeng, Yao-Jie Li, Wen-Jing Sun

11:35-11:50 | Presenter: Ze-Fan Chen (Southeast University)
A0228: Fragility analysis threshold of RC frame structures subjected to progressive collapse incorporating both demand and capacity uncertainties
Ze-Fan Chen, De-Cheng Feng

11:50-12:05 | Presenter: Ze-Yu Wang (China University of Geosciences, Beijing)
A0088: Benchmarks for uncertainty quantification-based digital twin in structural systems
Ze-Yu Wang

12:05-12:20 | Presenter: Lu-Chuan Ding (Tongji University)
A0338: Concept of dynamic sensitive failure mode during progressive collapse of RC building structures
Lu-Chuan Ding, Jian-Bing Chen, Robby Caspeele

Parallel Session 4 | Saturday, April 27, 10:25-12:10
Room 201, Venture Valley
MS07: Multiple Hazard Resilience Analysis and Enhancement of Critical Infrastructure under Uncertainties

organized by Zhong-Kai Huang (Tongji University), Dong-Ming Zhang (Tongji University), Hong-Wei Huang (Tongji University), Sotirios Argyroudis (Brunel University London)

Chair: Zhong-Kai Huang (Tongji University), Dong-Ming Zhang (Tongji University), Hong-Wei Huang (Tongji University)

10:25-10:40 | Presenter: Zhong-Kai Huang (Tongji University)
A0061: Optimal intensity measures for seismic fragility analysis of tunnels
Zhong-Kai Huang, Dong-Mei Zhang

10:40-10:55 | Presenter: Li-Qiang Cao (Beijing University of Technology)
A0101: Embedded isolation piles as protective measures to mitigate tunnelling-induced ground movements: an analytical investigation
Li-Qiang Cao, Xiang-Sheng Chen, De-Chun Lu, Dong Su

10:55-11:10 | Presenter: Bin-Lin Gan (Tongji University)
A0197: A comprehensive resilience evaluation method of shield tunnel structures under disaster disturbance
Bin-Lin Gan, Dong-Mei Zhang, Zhong-Kai Huang

11:10-11:25 | Presenter: Min-Wei Chen (Tongji University)
A0273: Vulnerability analysis and resilience evaluation of cable-stayed bridges subject to earthquakes and strong winds
Min-Wei Chen, Yan Xu

11:25-11:40 | Presenter: Hao Zhang (University of Sydney)
A0335: Cyclone damage assessment of distributed infrastructure systems under spatially correlated wind speeds
Hao Zhang, Di-Qi Zeng, Quan-Wang Li, Bruce R. Ellingwood

11:40-11:55 | Presenter: Xian-Cheng Mei (Chinese Academy of Sciences)
A0075: Study on the aseismic performance of damping structures composed of rubber-sand concrete for underground tunnel
Xian-Cheng Mei, Qian Sheng, Jian Chen, Zhen Cui

11:55-12:10 | Presenter: Xiao-Yu Zhang (Guangzhou University)
A0066: Seismic resilience assessment of large diameter shield tunnels crossing liquefiable soil-rock strata
Xiao-Yu Zhang, Ying-Yi Pan, Hai Liu, Jie Cui

Parallel Session 5

Parallel Session 5 | Saturday, April 27, 14:00-15:00
Conference Hall, 1st Floor, Yifu Building
MS02 (II): Dealing with Uncertainties in System Identification and Structural Health Monitoring

organized by Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology), Costas Papadimitriou (University of Thessaly)

Chair: Wang-Ji Yan (University of Macau), Xin-Yu Jia (Hebei University of Technology)

14:00-14:15 | Presenter: Ming-Ming Song (Tongji University)
A0184: Probabilistic digital twin of an offshore wind turbine
Ming-Ming Song, Babak Moaveni

14:15-14:30 | Presenter: Ji-Ren Zhang (Hunan University)
A0254: Bayesian spectral decomposition for efficient modal identification using ambient vibration
Zhou-Quan Feng, Ji-Ren Zhang, Lambros Katafygiotis, Xu-Gang Hua, Zheng-Qing Chen

14:30-14:45 | Presenter: Yu-Song Liu (University of Macau)
A0310: Structural anomaly detection based on Bayesian deep learning and transmissibility measurements
Yu-Song Liu, Wang-Ji Yan, Ka-Veng Yuen

14:45-15:00 | Presenter: Thomas Potthast (Leibniz Universität Hannover)
A0332: Stochastic model updating through sliced-normal-maps
Thomas Potthast, Masaru Kitahara, Matteo Broggi, Michael Beer

Parallel Session 5 | Saturday, April 27, 14:00-15:15
Meeting Room, 1st Floor, Yifu Building
MS20: Physics-informed Surrogate Modeling for Uncertainty Quantification and Optimization

organized by Cheng Su (South China University of Technology), Zi-Qi Wang (University of California Berkeley), Jian-Hua Xian (University of California Berkeley)

Chair: Cheng Su (South China University of Technology), Hao Zhou (South China University of Technology)

14:00-14:15 | Presenter: Lei Xie (Zhejiang University)
A0175: Enhancing real-time building functionality forecasting in flood disasters through social media integration: A deep learning approach
Lei Xie, Nai-Yu Wang

14:15-14:30 | Presenter: Zhi-Gang Tian (University of Alberta)
A0256: Gear health and remaining life prognosis considering surface wear and pitting
Han Zhang, Zhi-Gang Tian

14:30-14:45 | Presenter: Guo-Hai Chen (Dalian University of Technology)
A0284: Stochastic analysis of train-track-bridge coupling system subjected to near-fault pulse-like ground motion based on DPIM
Guo-Hai Chen, Ying-Jie Bao, Di-Xiong Yang

14:45-15:00 | Presenter: Wei-Li Xia (Zhejiang University)
A0305: Subset simulation with normalizing flow
Wei-Li Xia, Bin-Bin Li

15:00-15:15 | Presenter: Jing-Wei Liang (South China University of Technology)
A0309: Enhanced physics-informed neural network for dynamic response prediction of nonlinear systems
Cheng Su, Jing-Wei Liang

Parallel Session 5 | Saturday, April 27, 14:00-15:35
Room 113, 1st Floor, Yifu Building
MS06 (III): Reliability Design Analysis and Optimization of Structures and Critical Infrastructures

organized by Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland), Enrico Zio (Politecnico di Milano)

Chair: Yan Shi (Leibniz Universität Hannover), Meng-Ze Lyu (Tongji University), Michael Beer (Leibniz Universität Hannover), Bilal M. Ayyub (University of Maryland)

14:00-14:20 | (Invited Talk) Presenter: Juan-Ya Yu (University of Illinois Urbana-Champaign)
A0233: A probabilistic model for estimating the pressure at each node in a water distribution system
Juan-Ya Yu, Neetesh Sharma, Paolo Gardoni

14:20-14:35 | Presenter: Yang Bai (Tongji University)
A0115: Eccentric compressive reliability calculation of RC column using hyperspace division method
Yang Bai, Jie Li

14:35-14:50 | Presenter: Zhi-Wei Wang (Southeast University)
A0056: Non-parametric directional environmental contours: A method for estimating bridge design load combinations of wind and temperature
Zhi-Wei Wang, Wen-Ming Zhang, Michael Beer

14:50-15:05 | Presenter: Niklas R. Winnewisser (Leibniz Universität Hannover)
A0327: Resilience-based optimization of life cycle measure strategies considering adaptiveness in the context of linked data models
Niklas R. Winnewisser, Sally Saleem, Yan Shi, Leona Hennig, Julian Salomon, Matteo Broggi, Michael Beer

15:05-15:20 | Presenter: Zhao-Ping Xu (Tongji University)
A0365: Stochastic analysis of buckling behaviour for steel plates in CPSW/CF
Zhao-Ping Xu, Xiang-Ling Gao

15:20-15:35 | Presenter: Yu-Jing Li (Taiyuan University of Technology)
A0192: Interactive multi-objective optimization of offshore bridges subjected to corrosion and seismic hazards
Yu-Jing Li, Chang-Suo Zhang, Ning Song

Parallel Session 5 | Saturday, April 27, 14:00-15:15
Lecture Hall, 2nd Floor, Yifu Building

MS09 (III): Geotechnical Reliability Analysis and Risk Assessment: Challenges and Solutions

organized by Jie Zhang (Tongji University), Takayuki Shuku (Okayama University)

Chair: Jie Zhang (Tongji University), Shui-Hua Jiang (Nanchang University)

14:00-14:15 | Presenter: Shi-Ying Zheng (Okayama University)
A0283: Quantitative risk assessment for overflow of earth-fill dam by flooding using machine learning method
Shi-Ying Zheng, Shinichi Nishimura, Toshifumi Shibata, Takayuki Shuku

14:15-14:30 | Presenter: Cheng-Xin Feng (Leibniz Universität Hannover)
A0330: Efficient slope reliability analysis under soil spatial variability
Cheng-Xin Feng, Marcos A. Valdebenito, Marcin Chwała, Kang Liao, Matteo Broggi, Michael Beer

14:30-14:45 | Presenter: Meng Lu (Tongji University)
A0343: Probabilistic analysis of rainfall-induced landslides from initiation to runout based on a FEM-MPM approach
Meng Lu, M. Zhou, Jie Zhang

14:45-15:00 | Presenter: Taiga Saito (Tohoku University)
A0246: Adaptive missing data imputation of multivariate geotechnical properties with hierarchical Bayesian model for a major offshore airport
Taiga Saito, Yu Otake

15:00-15:15 | Presenter: Yuan Sun (Tongji University)
A0344: Risk analysis of the rainfall induced shallow landslides at a regional scale
Yuan Sun, Hua-An Wang, Hai-Jun Qin, Jie Zhang

Parallel Session 5 | Saturday, April 27, 14:00-15:35

C201, Sino-French Center

MS15: Advances in Risk Assessment and Resilience Enhancement of Bridge Infrastructure

organized by Jin-Song Zhu (Tianjin University), Bo Sun (Zhejiang University of Technology), Chao-Lin Song (Tongji University), Ze-Yu Wang (China University of Geosciences), Abdollah Shafieezadeh (Ohio State University)

Chair: Chao-Lin Song (Tongji University), Ze-Yu Wang (China University of Geosciences)

14:00-14:20 | (Invited Talk) Presenter: Yi-Chen Zhu (Southeast University)
A0359: Bridge condition assessment considering environmental and operational variations: A Bayesian approach
Yi-Chen Zhu, Shan-Hao Wu

14:20-14:35 | Presenter: Li-Zhao Dai (Changsha University of Science and Technology)
A0060: Sustainable multi-objective maintenance strategy for bridge networks integrating NSGA-Ⅲ and NOR-TOPSIS
Li-Zhao Dai, Rui Chen, Lei Wang

14:35-14:50 | Presenter: Yan-Lei Wang (Tianjin University)
A0155: Probabilistic inference framework of the long-term performance of long-span prestressed reinforced concrete bridges under the effect of multiple factors
Jin-Song Zhu, Yan-Lei Wang

14:50-15:05 | Presenter: Rui Luo (Tongji University)
A0179: Engineering design and reliability analysis based on an improved predictive formula for shear performance of UHPC beams
Rui Luo, Bin Sun, Chao-Lin Song, Ru-Cheng Xiao

15:05-15:20 | Presenter: Zu-Qian Jiang (Tongji University)
A0180: Investigation on the calculational methods for anti-overturning safety assessment of girder bridges
Zu-Qian Jiang, Ru-Cheng Xiao, Dong-Li Zhuang, Chao-Lin Song

15:20-15:35 | Presenter: Zi-Long Ti (Southwest Jiaotong University)
A0300: Frequency domain modelling framework for stochastic wind-wave actions on cross-sea bridge
Zi-Long Ti

Parallel Session 5 | Saturday, April 27, 14:00-15:00
C301, Sino-French Center
MS23 (II): Resilience and Sustainability Informed Integrity Management of Infrastructure Systems

organized by Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Jian-Jun Qin (Shanghai Jiao Tong University), Min Liu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)

Chair: Michael H. Faber (Aalborg University), Da-Gang Lu (Harbin Institute of Technology), Wei-Heng Zhang (Aalborg University)

14:00-14:15 | Presenter: Lan-Xin Li (Beijing University of Technology)
A0353: Optimal maintenance strategy of civil engineering infrastructure based on system resilience-cost
Lan-Xin Li, Xuan-Yi Zhang

14:15-14:30 | Presenter: Guo-Chuan Sun (Beijing University of Technology)
A0354: Research on life cycle management of water supply networks based on sustainable development
Guo-Chuan Sun, Zhao-Hui Lu, Xuan-Yi Zhang

14:30-14:45 | Presenter: Yao Dong (Harbin Institute of Technology)
A0362: Societal fatality risk evaluation of mainland china based on improved F-N functions
Yao Dong, Da-Gang Lu, Min Liu

14:45-15:00 | Presenter: Wei-Heng Zhang (Aalborg University)
A0363: The effect of epistemic uncertainty on risk-based inspection planning
Wei-Heng Zhang, Thomas Bull, Paul-Remo Wagner, Daniel V. Muff, Matthias Schubert, Hans Jørgen Riber, Michael H. Faber

Parallel Session 5 | Saturday, April 27, 14:00-15:15
C401b, Sino-French Center
MS21: Advancements in Stochastic Dynamics for Design and Assessment of Resilient and Sustainable Engineering Structures

organized by Ioannis A. Kougioumtzoglou (Columbia University), Agathoklis Giaralis (Khalifa University), Fan Kong (Hefei University of Technology), Yuan-Jin Zhang (Wuhan University of Technology), Alberto Di Matteo (University of Palermo), Antonina Pirrotta (University of Palermo)

Chair: Fan Kong (Hefei University of Technology), Yuan-Jin Zhang (Wuhan University of Technology), Alberto Di Matteo (University of Palermo)

14:00-14:15 | Presenter: Luo Bo (The Hong Kong University of Science and Technology)
A0130: Virtual modelling assisted stochastic size-dependent stability analysis of the perovskite solar cell
Luo Bo, Ji-Ze Zhang

14:15-14:30 | Presenter: Zi-Feng Huang (Leibniz Universität Hannover)
A0275: The MTST method for estimating Wigner-Ville and Loève spectra of quasi-stationary harmonizable processes
Zi-Feng Huang, Michael Beer

14:30-14:45 | Presenter: Jian Ma (Wuhan University of Technology)
A0312: Random response analysis of multi-degree-of-freedom frame-rocking wall structure under non-stationary earthquakes
Jian Ma, Ying-Hua Song

14:45-15:00 | Presenter: Rui-Jing Zhang (Harbin Institute of Technology)
A0313: Polynomial chaos representation of non-Gaussian random fields based on optimal transportation theory
Rui-Jing Zhang, Hong-Zhe Dai

15:00-15:15 | Presenter: Alberto Di Matteo (University of Palermo)
A0337: Determination of nonstationary stochastic response of nonlinear oscillators endowed with fractional derivative elements
Alberto Di Matteo, Antonina Pirrotta, Pol D. Spanos

Parallel Session 5 | Saturday, April 27, 14:00-15:05
A401, Sino-French Center

MS13 (III): AI for Uncertainty Quantification

organized by Tong Zhou (Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Yong-Bo Peng (Tongji University), Michael Beer (Leibniz Universität Hannover), Bruno Sudret (ETH Zürich), Enrico Zio (Politecnico di Milano)

Chair: Tong Zhou (The Hong Kong Polytechnic University), Chao Dang (Technische Universität Dortmund), Michael Beer (Leibniz Universität Hannover), Si-Feng Bi (University of Strathclyde)

14:00-14:20 | (Invited Talk) Presenter: Andrea Perin (Leibniz Universität Hannover)
A0243: Enhanced Bayesian network for reliability assessment with interval probability: application to salt domes as disposal sites for radioactive waste
Andrea Perin, Matteo Broggi, Michael Beer

14:20-14:35 | Presenter: Zheng-Rong Jin (Northwestern Polytechnical University)
A0318: Adaptive trajectory hybrid sampling with PINNs for solving FPK equations
Zheng-Rong Jin, Wan-Tao Jia

14:35-14:50 | Presenter: Fritz Sihombing (Calvin Institute of Technology)
A0322: Tsunami risk assessment using reduced order modeling and deep learning surrogate
Fritz Sihombing

14:50-15:05 | Presenter: Maximilian Schweizer (Karlsruhe Institute of Technology)
A0329: Artificial neural network surrogate modelling for random fields in structural stability
Maximilian Schweizer, Marc Fina, Werner Wagner, Steffen Freitag

Parallel Session 5 | Saturday, April 27, 14:00-15:30
Room 104, Venture Valley

MS19: Data-Driven Risk and Resilience Modeling of Infrastructure against Catastrophic Hazards

organized by Xiao-Wei Wang (Tongji University), Rui-Wei Feng (The Hong Kong Polytechnic University), Yao-Han Li (Hong Kong Metropolitan University), Yue Li (Case Western Reserve University)

Chair: Xiao-Wei Wang (Tongji University), Rui-Wei Feng (The Hong Kong Polytechnic University), Yao-Han Li (Hong Kong Metropolitan University)

14:00-14:15 | Presenter: Xing Fu (Dalian University of Technology)
A0050: A data-driven method for the reliability analysis of a transmission line under wind loads
Xing Fu, Hong-Nan Li, Zhi-Qian Dong, Gang Li

14:15-14:30 | Presenter: You Wu (Zhejiang University)
A0148: Real-time correction of wind forecasts to support risk prediction of power transmission systems during typhoon evolution
You Wu, Nai-Yu Wang, Xiu-Bing Huang

14:30-14:45 | Presenter: Yaohan Li (Hong Kong Metropolitan University)
A0311: Probabilistic long-term risk and resilience assessment under hazards
Yao-Han Li, You Dong

14:45-15:00 | Presenter: Rui-Wei Feng (Hong Kong Polytechnic University)
A0112: Data-driven life-cycle seismic resilience prediction of sea-crossing bridges with marine corrosion
Rui-Wei Feng, Hong-Yuan Guo, You Dong

15:00-15:15 | Presenter: Ling-Yun Gou (Tongji University)
A0282: Using AI technology to understand the progress and challenge of AI-aided bridge earthquake engineering
Ling-Yun Gou, Xiao-Wei Wang, Ai-Jun Ye, Jian-Zhong Li

15:15-15:30 | Presenter: Dong Zhou (Sichuan University)
A0107: Risk-based fatigue assessment of super-tall hybrid wind turbine towers
Dong Zhou, Yu-Xiao Luo, Jun-Lin Heng, Yang-Zhao Liu, Kaoshan Dai, Charalampos Baniotopoulos

Parallel Session 5 | Saturday, April 27, 14:00-15:00
Room 103, Venture Valley
MS26: Dynamics, Loads and Probabilistic Design of Offshore Wind Turbines

organized by Yu-Peng Song (Nanjing Tech University), Zi-Li Zhang (Tongji University), Chao Sun (Louisiana State University), Jian-Bing Chen (Tongji University), Biswajit Basu (Trinity College Dublin)

Chair: Yu-Peng Song (Nanjing Tech University), Zi-Li Zhang (Tongji University)

14:00-14:15 | Presenter: Lin-Feng Li (Shanghai Jiao Tong University)
A0126: Probabilistic analysis of fatigue crack growth evolution for offshore wind turbines under multi-source uncertainty
Lin-Feng Li, Yue Pan, Jian-Jun Qin

14:15-14:30 | Presenter: Yu-Peng Song (Nanjing Tech University)
A0211: Joint probability distribution modelling of wind and waves under typhoon impact
Yu-Peng Song, Xu Hong, Zi-Li Zhang

14:30-14:45 | Presenter: Dan Wang (Hunan University)
A0303: Nonlinear dynamic response analysis of concrete-steel hybrid wind turbines
Jun Xu, Dan Wang, Ze-Yu He

14:45-15:00 | Presenter: Jia-Hang Lyu (Tongji University)
A0346: Stochastic response analysis of a spar-type FOWT under random extreme ocean waves
Jia-Hang Lyu, Jian-Bing Chen, Pol D. Spanos, Jie Li

Parallel Session 5 | Saturday, April 27, 14:00-15:15
Room 201, Venture Valley
MS12: Mitigating Uncertainties in Predicting the Life-Cycle Performance of Aging Structures and Infrastructure Systems Using Observational Information

organized by Si-Yi Jia (Waseda University), Mitsuyoshi Akiyama (Waseda University), Dan M. Frangopol (Lehigh University)

Chair: Si-Yi Jia (Waseda University), Mitsuyoshi Akiyama (Waseda University), Michiyuki Hirokane (Kansai University)

14:00-14:15 | Presenter: Si-Yi Jia (Waseda University)
A0086: A Bayesian approach to mitigate the uncertainties in the prediction of time-dependent deflection of prestressed concrete bridges
Si-Yi Jia, Mitsuyoshi Akiyama, Dan M. Frangopol

14:15-14:30 | Presenter: Zheng-Shu He (Southwest Jiaotong University)
A0152: Reliability-based assessment of deteriorated RC shield tunnels by considering the spatial variability of steel corrosion in segments
Zheng-Shu He

14:30-14:45 | Presenter: Zhe-Jun Xu (Waseda University)
A0156: Assessment of load-bearing capacity of corroded concrete structures based on observational information of corrosion-induced cracks
Zhe-Jun Xu, Mitsuyoshi Akiyama, Dan M. Frangopol

14:45-15:00 | Presenter: Ming-Yang Zhang (Shenzhen University)
A0190: Machine learning-based probabilistic estimation of flexural loading capacity of corroded RC structures using crack width distribution
Ming-Yang Zhang

15:00-15:15 | Presenter: Zhi Ma (Hangzhou City University)
A0319: Condition assessment for spatial structures based on health monitoring data and Bayesian approach
Zhi Ma, Yao-Zhi Luo, Chung-Bang Yun, Hua-Ping Wan

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