

IEMForum

The **I**nternational **E**ngineering **M**echanics **F**orum

Program

February 22-25, 2021, Yokohama, Japan

Kanagawa University



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Message from the Forum Chair



Yan-Gang Zhao



Haizhong Zhang

It is our pleasure to welcome you to the International Engineering Mechanics Forum (IEMForum2020), which is held at the Kanagawa University between 22 and 25 February 2021. The International Engineering Mechanics Forum (IEMForum) was established by Professor Yan-Gang Zhao with support from Kanagawa University to promote modern engineering mechanics theory and its application, to assist and advance research and development in engineering mechanics. Under this background, the International Engineering Mechanics Forum (IEMForum) aims to bring together international experts to disseminate recent research findings and discuss developments in the modern engineering mechanics theory and its application.

Previous editions of the annual IEMForum took place in Yokohama (Japan, 2014); Changsha (China, 2015); Yokohama (Japan, 2016); Guangzhou (China, 2017); Chengdu (China, 2018). The 6th International Engineering Mechanics Forum (IEMForum2020) was originally scheduled in Sep. 18-21, 2020 at Kanagawa University (Yokohama, Japan). Due to COVID-19, it is postponed to Feb. 22-25, 2021, and held online by Zoom meeting.

On behalf of the Organizing Committee, we warmly welcome you to join this event through our Zoom meeting room. We hope you would have a fruitful time in the forum, get re-acquainted with old friends, make new friends, and enjoy the first online event in the series of IEMForum.

Thank you!

Warmly,

Yan-Gang Zhao Haizhong Zhang

Prof. Yan-Gang Zhao and Haizhong Zhang

Chair - IEMForum2020

Keynote Lectures

Lecture Title: Hazard-resilient infrastructure: Practical methodology for analysis and design



Bilal M. Ayyub

Professor, University of Maryland, USA

ba@umd.edu

Bilal M. Ayyub is Professor and the Director of Center for Technology and Systems Management at the University of Maryland, College Park. His main research interests and work are in risk, resilience, sustainability, uncertainty and decision analysis, applied to civil engineering and infrastructures. Professor Ayyub is a distinguished member of ASCE and an honorary member of ASME.

Dr. Ayyub is the recipient of several awards including ASCE Alfredo Ang Award, ASCE President Medal, ASCE Le Val Lund Award, etc. He is the editor-in-chief of the ASCE-ASME Journal on Risk and Uncertainty in Engineering Systems in its two parts on civil and mechanical engineering.

Lecture Title: Site response modelling for ground-motion prediction equations



John Zhao

Professor, Shandong Jianzhu University, China

johnzhao1000@126.com

John Zhao is currently the chief professor of School of Civil Engineering, Shandong Jianzhu University, and special expert of National Talent Plan (full time), China. His main research interests and work include the empirical strong-ground motion modelling. Professor Zhao carried out research and development, and commercial applications for seismic isolation in a number of countries. The ground-motion models produced by his team in 2006 has been widely used in the probabilistic seismic hazards studies in the subduction zones around the world. After working in New Zealand for more than 20 years, he returned to work in China in 2011 as an awardee of the Thousands Talent Program. In 2017, he was a recipient of the Recruitment Program of Top Talent from the government of the Shandong Province.

Lecture Title: Condition assessment on the high-speed railway ballastless track-bridge structural system



Zhao-Hui Lu

Professor, Beijing University of Technology, China

luzhaohui@bjut.edu.cn

Zhao-Hui Lu is currently the professor of College of Architecture and Civil Engineering at Beijing University of Technology. His expertise includes structural reliability assessment based on methods of moment and risk-cost optimized maintenance strategy for concrete structures with emphasis on high-speed railway engineering structures using time-dependent reliability method. He has chaired and participated in more than 8 research projects including the National Natural Science Fund for Excellent Young Scholars of China and Key Projects of International Cooperation and Exchanges from NSFC. He was awarded the First prize of Railway Science and Technology of China Railway Association in 2014 due to his innovative and significant contribution in the field. He is the Chair of the 7th International Symposium on Reliability Engineering and Risk Management, and an active member of Committee of Structural Reliability, Bridge and Structural Engineering Branch of China Society of Civil Engineering.

Lecture Title: Too many or too few soil layers?



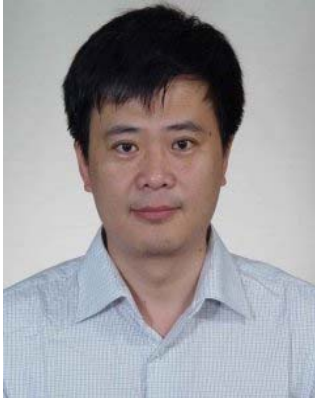
Kok-Kwang Phoon

Distinguished Professor, National University of Singapore, Singapore

kkphoon@nus.edu.sg

Kok-Kwang Phoon is Distinguished Professor and Senior Vice Provost (Academic Affairs), National University of Singapore. He is particularly interested in developing statistical and other data-driven methods to support decision making in geotechnical engineering. He was bestowed the ASCE Norman Medal twice in 2005 and 2020, and the Humboldt Research Award in 2017, among others. He is the Founding Editor of Georisk and advisory board member for the WEF Global Risks Report. He was elected as a Fellow of the Academy of Engineering Singapore in 2012.

Lecture Title: Intelligent inspection of concrete rebar by a GPR-EMI dual sensor



Jie Cui

Professor, Guangzhou University, China

jcui2009@hotmail.com

Jie Cui is the dean of School of Civil Engineering, Guangzhou University, and executive director of Engineering Seismic Research Center. He is mainly engaged in scientific research and teaching in disaster prevention and mitigation, earthquake engineering, etc. Professor Cui is a member of the Civil Engineering Expert Committee of National Natural Science Foundation of China (NSFC), a member of the Geotechnical Testing Committee of the Chinese Society of Civil Engineering, a director of the Disaster Prevention Branch of the Chinese Society of Civil Engineering, a director of the Technology Promotion Committee of the Chinese Society of Civil Engineering, a deputy director of the Youth Work Committee of the Chinese Society of Seismology, a secretary of the Seismological Engineering Committee of the Chinese Society of Seismology, a member of the Heilongjiang Mechanics Society, the vice chairman of Journal of Natural Disasters, the editorial board member of Journal of Seismology, and the editorial board member of World Earthquake Engineering.

Lecture Title: The impact of Sanhe-Pinggu(1679's) (Ms8.0) and Tangshan great earthquake (1976's) (Ms7.8) reappearance on today's society



Baitao Sun

Professor, Institute of Engineering Mechanics, China Earthquake Administration, China

sunbt@iem.cn

Baitao Sun is currently the director of the Institute of Engineering Mechanics, China Earthquake Administration, China. His main research interests and work include the engineering mechanics, earthquake engineering, earthquake damage prevention, disaster loss assessment and disaster emergency rescue, building safety appraisal at earthquake site, earthquake damage prediction, earthquake response analysis of special structures. Professor Sun is the editor in chief of World Journal of Earthquake Engineering, deputy editor in chief of Journal of Natural Disasters, member of United Nations Expert Group on Urban Disaster Assessment and Coordination (UNDAC), director of China Society of Mechanics, leader of China Earthquake Disaster Loss Assessment, Safety Appraisal and Scientific Investigation Group, the only editorial board member of World Housing Encyclopedia in China, and member of Heilongjiang Disaster Reduction Committee and director of Harbin Disaster Prevention Center.

Lecture Title: Processing method for impulsive ground motions and its application to base-isolated building



Wuchuan Pu

Professor, Wuhan University of Technology, China

puwuchuan@whut.edu.cn

Wuchuan Pu is the associate professor at Wuhan University of Technology, China. His main research interests and work include seismic response control, reliability-based design, ground motion processing method. Professor Pu received PhD degree from Nagoya Institute of Technology, he has been a postdoctoral researcher of Tokyo Institute of Technology, and selected as Chutian Scholars of Hubei Province of China. He is young member of Random Vibration Committee of China Society of Vibration Engineering, reviewer of external dissertations of Ministry of Education of China, and reviewer of more than ten academic journals.

Lecture Title: Seismic performance assessment of damaged reinforced concrete buildings



Chien-Kuo Chiu

Professor, National Taiwan University of Science and Technology

ckchiu@mail.ntust.edu.tw

Chien-Kuo Chiu is the vice dean of the College of Engineering, National Taiwan University of Science and Technology. He is mainly engaged in the deterioration analysis of RC buildings, deterioration risk management, durability design and maintenance of RC buildings. Professor Chiu received the Taiwan-Japan Exchange Association Scholarship, in 2005-2007, and foreign scholarships from Honjo International Scholarship Foundation (Itoen enterprise, Japan), in 2007-2008. He also won the “Best Paper Award” in 11th International Conference on Durability of Building Materials and Components (DBMC), in Turkey, 2008.

Lecture Title: Quantification of probabilistic dependence of constitutive parameters and global reliability evaluation of concrete structures

Jianbing Chen

Professor, Tongji University, China

chenjb@tongji.edu.cn



Jianbing Chen is currently professor at Tongji University. He specializes in the field of uncertainty quantification, stochastic mechanics, and engineering reliability. He received the National Natural Science Award of China (2nd class) and the 2017 IASSAR Early Achievement Award by the International Association for Structural Safety and Reliability (IASSAR), and was granted by the National Science Fund for Distinguished Young Scholars (2017). He now serves as member of the international Joint Committee on Structural Safety (JCSS), the Board of Directors of the International Civil Engineering Risk and Reliability Association (CERRA), etc.

Lecture Title: Application of interval non-probabilistic reliability theory in pit stability analysis

Luwen Qie

Professor, Hebei University, China

qieluwen@hbu.edu.cn



Luwen Qie is the vice dean of College of Civil Engineering & Architecture of Hebei University, and member of Academic Committee of Hebei University and member of Teaching Steering Committee of Hebei University. He is mainly engaged in the theoretical research of structural reliability, and has published more than 40 Chinese and English papers on the reliability performance evaluation and life analysis of existing structures such as breakwater, wharf, slope and bridge, etc.

Professor Qie is a member of China Mechanics Association, an expert of Hebei Natural Science Foundation, and a peer reviewer of China Ocean Engineering, Journal of Oceanography, Journal of Harbin Institute of Technology, Journal of Hebei University, etc.

Lecture Title: Earthquake resistance and mitigation design theory, method and its application of irregular bridges



Xiuli Du

Professor, Beijing University of Technology, China

duxiuli@bjut.edu.cn

Xiuli Du is currently vice president of Beijing University of Technology, China. His main research interests and work include highly efficient algorithms for complex wave dynamics, artificial boundaries, multi-axial strength theory and elasto-plastic constitutive theory for geomaterials, microscopic analysis of mechanical properties of concrete materials. Professor Du is an advisory consultant of Science Departments and head of the Evaluating Committee for Civil Engineering and Transportation Engineering of the National Natural Science Foundation of China, member of the Civil Engineering Group of the Academic Degrees Committee of the State Council. He is also the president of International Society of Lifeline and Infrastructure Earthquake Engineering, committee member of the International Association of Protective Structures, Seismology Society of China, China Civil Engineering Society, and the Architectural Society of China.

Lecture Title: Efficient analysis of structures with hybrid uncertainties



Michael Beer

Professor, Leibniz University Hannover, Germany

beer@irz.uni-hannover.de

Michael Beer is Professor and Head of the Institute for Risk and Reliability, Leibniz University Hannover, Germany. His research is focused on non-traditional uncertainty models in engineering with emphasis on reliability and risk analysis. In 2014 he established the EPSRC and ESRC Centre for Doctoral Training in Quantification and Management of Risk & Uncertainty in Complex Systems & Environments. Professor Beer is also the editor in Chief (jointly) of the Encyclopedia of Earthquake Engineering (Springer) and the Associate Editor of the other two journals.

Committees

Forum Chair and Secretariat

Y.G. Zhao, *Kanagawa University*, Japan (Chair)

H.Z. Zhang, *Kanagawa University*, Japan (Co-Chair)

X.Y. Zhang, *Beijing University of Technology*, China (Secretariat)

International Scientific Committee

A.H.S. Ang, *University of California*, Irvine, USA (Chair)

B.T. Sun, *Institute of Engineering Mechanics*, China

C.K. Chiu, *National Taiwan University of Science and Technology*

J. Cui, *Guangzhou University*, China

K. Shimazaki, *Kanagawa University*, Japan

M. Fujita, *Kanagawa University*, Japan

T. Enomoto, *Kanagawa University*, Japan

T. Ono, *Nagoya Institute of Technology*, Japan

W.C. Pu, *Wuhan University of Technology*, China

X.L. Du, *Beijing University of Technology*, China

Z.H. Lu, *Beijing University of Technology*, China

Local Organizing Committee

H.Z. Zhang, *Kanagawa University*, Japan (Chair)

X.Y. Zhang, *Beijing University of Technology*, China (Secretary-general)

F.W. Ge, *Kanagawa University*, Japan

J.M. Li, *Kanagawa University*, Japan

L. Ren, *Kanagawa University*, Japan

M.N. Tong, *Central South University*, China

P.P. Li, *Kanagawa University*, Japan

X.F. Yan, *Kanagawa University*, Japan

Supporting Organization

Kanagawa University

Beijing University of Technology

Institute of Engineering Mechanics, China Earthquake Administration

Presentation

Online: Zoom

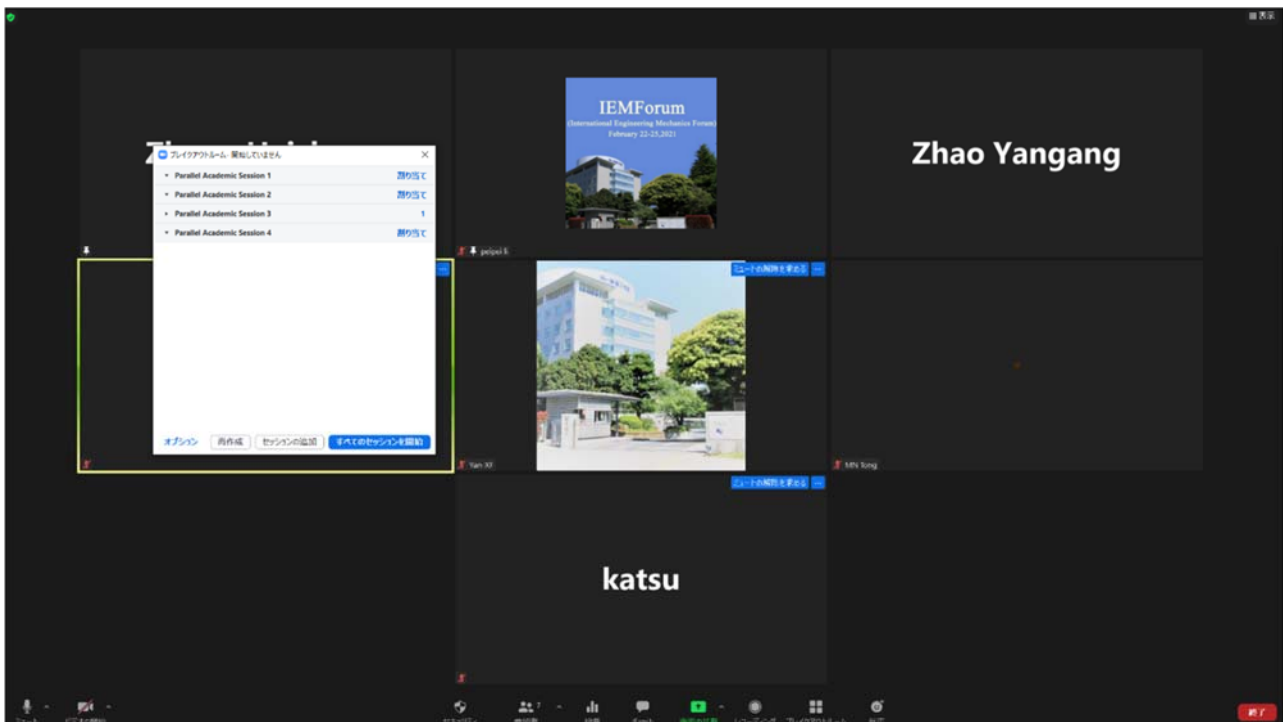
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Password: lab1232

Note:

- All participants should update the latest version of Zoom and indicate his/her name before entering the online meeting room.
- All presenters need to be connected to Zoom by 15 minutes before the session begins.
- To join in the parallel sessions, following steps are required:

Start the “Zoom” software/app → Enter the meeting room by inputting the ID → Click “Breakout Rooms” [Button] → Choose the parallel session of interest with “join” [Button]



Technical Program

Instruction Manual	Presentation Time	
	Keynote Speaker	30 minutes (Including question time)
	Parallel Session Speaker	15 minutes (Including question time)

Monday, February 22, 2021 (Tokyo time / GMT +9)

Test Time	Zoom Information	
9:00-12:00	Zoom ID	Password
13:30-17:00	312 655 4388	lab1232

Tuesday, February 23, 2021 (Tokyo time / GMT +9)

Time	Forum Arrangement	
8:50-9:00	Opening Ceremony: Welcome Address (<i>Takahisa Enomoto</i>)	
	Keynote Lecture 1, Chair: <i>Kok-Kwang Phoon</i>	
9:00-9:30	Bilal M. Ayyub	Hazard-resilient infrastructure: Practical methodology for analysis and design
9:30-10:00	John Zhao	Site response modelling for ground-motion prediction equations
10:00-10:30	Zhao-Hui Lu	Condition assessment on the high-speed railway ballastless track-bridge structural system
	Break	
	Keynote Lecture 2, Chair: <i>Jianbing Chen</i>	
10:40-11:10	Kok-Kwang Phoon	Too many or too few soil layers?
11:10-11:40	Jie Cui	Intelligent inspection of concrete rebar by a GPR-EMI dual sensor
11:40-12:10	Baitao Sun	The impact of Sanhe-Pinggu (1679's) (Ms8.0) and Tangshan great earthquake (1976's) (Ms7.8) reappearance on today's society
	Lunch Time	
	Keynote Lecture 3, Chair: <i>Xiuli Du</i>	
13:10-13:40	Wuchuan Pu	Processing method for impulsive ground motions and its application to base-isolated building
13:40-14:10	Chien-Kuo Chiu	Seismic performance assessment of damaged reinforced concrete buildings
14:10-14:40	Jianbing Chen	Quantification of probabilistic dependence of constitutive parameters and global reliability evaluation of concrete structures
	Break	
	Keynote Lecture 4, Chair: <i>John Zhao</i>	
14:50-15:20	Luwen Qie	Application of interval non-probabilistic reliability theory in pit stability analysis
15:20-15:50	Xiuli Du	Earthquake resistance and mitigation design theory, method and its application of irregular bridges
15:50-16:20	Michael Beer	Efficient analysis of structures with hybrid uncertainties

Wednesday, February 24, 2021 (Tokyo time / GMT +9)

Time	Forum Arrangement	
	Parallel Academic Session 1 Chair: Xuanyi Zhang	Parallel Academic Session 2 Chair: Xiaowen Ji
09:00-9:15	Reliability of CRTS II track slab considering safety and serviceability <i>Xuanyi Zhang</i>	Analysis of factors affecting reliability growth based on system dynamics <i>Jingfen Li</i>
9:15-9:30	EQ Alert: using smartphone for on-site earthquake early warning <i>TingYu Hsu</i>	Time-dependent reliability evaluation of CRTS II track slab based on conditional probability method <i>Bao-Zheng Jin</i>
9:30-9:45	Improved adaptive wolf pack algorithm based on clustering <i>Shufang Song</i>	Investigation on flutter uncertainty of bridge deck induced by sampling error of flutter derivatives <i>Xiaowen Ji</i>
09:45-10:00	Compressive behaviour of circular concrete axially loaded CFDST stub columns <i>Xi-Feng Yan</i>	Extreme value distribution of structural response induced by nonstationary stochastic excitations <i>Ye-Yao Weng</i>
10:00-10:15	Seismic fragility analysis based on 3P-lognormal distribution <i>Fangwen Ge</i>	A time-dependent reliability analysis method using joint failure probability estimation <i>Xiangwei Li</i>
	Break	
	Parallel Academic Session 3 Chair: Siqi Lin	Parallel Academic Session 4 Chair: Haizhong Zhang
10:25-10:40	Estimation of load and resistance factors using the 3P-lognormal transformation <i>Peipei Li</i>	Reliability assessment of CRTS-II track slab considering correlated random variables <i>Hao-Rui Jiang</i>
10:40-10:55	Reliability assessment of project duration based on cubic normal transformation <i>Lu Ren</i>	Simulating stationary non-Gaussian process based on fourth-moment normal transformation <i>Zhao Zhao</i>
10:55-11:10	Polynomial normal transformation based on L-moments <i>Mingna Tong</i>	Research on evaluation method of system reliability design based on SEP <i>Jiake Li</i>
11:10-11:25	Theoretical model for concrete-filled steel tube stub columns with different cross-sectional shapes subject to axial compression <i>Siqi Lin</i>	Moment method with Box-Cox transformation for structural reliability <i>Chao-Huang Cai</i>
11:25-11:40	Experimental study on flexural behavior of high-speed railway box girder subject to chloride attacking <i>Hai Li</i>	An efficient approach for numerical simulation of concrete-filled round-ended steel tubes <i>Qiang Zhang</i>
11:40-11:50	Closing Ceremony: Closing Address (Yan-Gang Zhao)	

Contact

Conference Secretariat:

Dr. Xuanyi Zhang

Assistant Professor, Department of Architecture, Beijing University of Technology, China

E-mail: iemforum2020@163.com

Mobile: +86-135-7419-3039

**Post mail address: Key Laboratory of Urban Security and Disaster Engineering of
Ministry of Education, Beijing University of Technology, Beijing 100124, China**

