



**CONFERENCE  
PROGRAM**

## July 22 (Sunday)

10:00am – 10:00pm

### Registration Opens

**Registration Desk:** Hotel lobby, 1st Floor, Shangri-La Hotel

1:30pm – 4:30pm

### Board Meeting of IASCM

**Room:** Function Room 24, 2nd Floor, Shangri-La Hotel

6:00pm – 8:30pm

### Reception

**Location:** Grand Ballroom, 1st Floor, Shangri-La Hotel

## July 23 (Monday)

8:00am – 7:00pm

### Registration Opens

**Registration Desk:** Hotel lobby, 1st Floor, Shangri-La Hotel

8:30am – 9:00am

### Conference Welcome and Opening

Professor Hui Li, 7WCSCM Chair & President of IASCM, **Location:** China Hall

### Keynote Sessions 1 (Chairs: Sami F. Masri & Hongnan Li, Location: China Hall, Shangri-La Hotel)

9:00am – 9:30am

#### Keynote 1 - A Complexity-based Framework for Structural Health Monitoring

Professor Charles R. Farrar, Los Alamos National Laboratory, USA

9:30am – 10:00am

#### Keynote 2 - Bayesian Framework for System Identification and Structural Health Monitoring: Theory, Algorithms and Applications

Professor James L. Beck, California Institute of Technology, USA

10:00am – 10:30am

### Coffee break

### Keynote Sessions 2 (Chairs: José Rodellar & Zhisheng Wu, Location: China Hall, Shangri-La Hotel)

10:30am – 11:00am

#### Keynote 3 -R&D Governmental Program in Japan for Efficient Maintenance, Renovation and Management of Infrastructure

Professor Yozo Fujino, Yokohama National University, Japan

11:00am – 11:30am

#### Keynote 4 - Structural Health Monitoring and the Life Prediction and Maintenance of Civil Infrastructures

Professor Jinping Ou, Harbin Institute of Technology & Dalian University of Technology, China

11:30am – 12:00pm

#### Keynote 5 - Challenges on Dynamics Problem in Chinese High-speed Railways

Professor Wanming Zhai, Southwest Jiaotong University, China

**12:00pm - 1:00pm**

**Lunch**

**Location:** Grand Ballroom, 1st Floor, Shangri-La Hotel

**Concurrent Sessions 1 (Fuxin Hotel)**

**Session 1.1 - Room: 117**

**SS03(1): Application, Research and Design on Structural Control in Japan**

**Chairs:** Masashi Yamamoto; Masayuki Kohiyama

**1:30pm - 1:50pm** Invited paper: **Highly efficient semi-active oil damper with energy recovery system**  
H. Kurino, R. Fukuda (Kajima Corporation, Japan)

**1:50pm - 2:05pm** Control effect of large tuned mass damper applied to existing high-rise building for seismic retrofit  
T. Yaguchi, H. Kurino, T. Nakai (Kajima Corporation, Japan)

**Session 1.2 - Room: 223**

**SS04(1): New Development of Smart Devices for Structural Control**

**Chairs:** Jianchun Li; Songye Zhu

Invited paper: **Development of smart base isolation system utilizing magnetorheological elastomer**  
J.C. Li, Y.C. Li, X.Y. Gu (University of Technology Sydney, Australia)

**Model predictive control for deployable, autonomous control systems**  
K. Goorts, S. Narasimhan (University of Waterloo, Canada)

**Session 1.3 - Room: 125**

**SS09(1): Wind Effects and Wind-Induced Vibration Control for Large-Scale Structures**

**Chairs:** Hao Wang; Xin Chen

Invited paper: **Tuning fire suppression tanks for tuned sloshing damper applications**  
J.S. Love (RWDI Co. Ltd., Canada), D. Li (RWDI China Co. Ltd., China), X.D. Du (RWDI Co. Ltd., Canada)

**Invited paper: Wavelet-based estimation of evolutionary spectra and application to field measurement typhoon process**  
G.D. Zhou (Hohai University, China), A.Q. Li (Beijing University of Civil Engineering and Architecture, China)

**Session 1.4 - Room: 221**

**SS32: Smart and Multifunctional Concrete**

**Chairs:** Xinchun Guan; Baoguo Han

Invited paper: **Nano-engineered smart/multifunctional concrete**  
L.Q. Zhang, B.G. Han, J.P. Ou (Dalian University of Technology, China)

**Investigation of microstructural phase for hardened cement paste incorporated to nanofibers**  
T.N.M. Nguyen, J.J. Kim (Kyungnam University, Korea)

**2:05pm - 2:20pm** Experimental verification of a tuned mass damper with two-phase support mechanism for improving seismic performance of existing high-rise buildings  
T. Sone, K. Ogino, N. Kamoshita, K. Mutou (Takenaka Corporation, Japan), Y. Ide (Thai Takenaka International Ltd., Thailand), K. Murata, H. Hamaguchi, M. Yamamoto (Takenaka Corporation, Japan)

**Tuned mass damper systems application for Chong Qi bridge girder sections to reduce vortex shedding induced vibration**  
P. Nawrotzki, C. Meinhardt (GERB vibration control system, Germany), X.J. Yin, J.L. Wang, Y. Luo (GERB (Qingdao) Vibration Control Co. Ltd., China)

**Preparation, characterization, and application of NTC NiMn<sub>2</sub>O<sub>4</sub>-LaMn<sub>1-x</sub>Ti<sub>x</sub>MnO<sub>3</sub> (0 ≤ x ≤ 0.7) composite ceramics**  
F. Guan, H. Dai, S.F. Huang, X. Cheng (Shandong Provincial Key Lab. of Preparation and Measurement of Building Materials; University of Jinan, China)

**2:20pm - 2:35pm** Development and analysis of long stroke TMD for earthquake

Y. Ishikawa, R. Maseki, Y. Kimura, N. Yamato (Taisei Corporation, Japan)

**Decentralized algorithm for semi-active damping of forced vibrations using controllable truss-frame nodes**

B. Poplawski, G. Mikulowski (Polish Academy of Sciences, Poland), A. Mroz (Adaptironica Sp. z o.o., Poland), L. Jankowski (Polish Academy of Sciences, Poland)

**In-plane flexural vibration of a coupled system with box hanger and wind resistant cables in long-span steel arch bridges**

X.G. Hua, K. Xu (Hunan University, China), J.L. Luo, C.W. Zhang (Qingdao University of Technology, China), Z.D. Duan (Harbin Institute of Technology, China), Q.Y. Li (Qingdao University of Technology; Qingdao Agricultural University, China)

**Percolation threshold and piezoresistive behavior of car-bon nanotube reinforced cement composite**

J.L. Luo, C.W. Zhang (Qingdao University of Technology, China), Z.D. Duan (Harbin Institute of Technology, China), Q.Y. Li (Qingdao University of Technology; Qingdao Agricultural University, China)

**2:35pm - 2:50pm** Analytical study on response reduction effect by tuned mass damper with amplifier mechanism

J. Maruo (Toda Corporation, Japan), H. Fujitani, Y. Mukai, M. Ito (Kobe University, Japan)

**Performance evaluation of an eddy-current tuned mass damper for seismic protection using shaking table tests**

Z.G. Shi (Tongji University, China), C.N. Loong, Y. Tan, C.C. Chang (The Hong Kong University of Science and Technology, China), J.Z. Shan (Tongji University, China)

**Vibrations of two shallow cables with a cross-tie**

D.X. Hong, L.M. Sun, L. Chen (Tongji University, China)

**Smart aggregates made by thick-film resistors for concrete**

X.C. Guan, M. Wen, H. Li, J.P. Ou (Harbin Institute of Technology, China)

**2:50pm - 3:05pm** Performance-based design methodology of tuned mass damper for mitigating seismic damage to nonstructural components

K. Kaneko (Tokyo Institute of Technology, Japan)

**Optimal clipped linear strategies for controllable damping**

Q. Fang, E.A. Johnson (University of Southern California, USA), P.T. Brewick (University of Southern California; U.S. Naval Research Laboratory, USA), S.F. Wojtkiewicz (Clarkson University, USA)

**Investigation of wind-induced vibration of cable-stayed bridges based on field measurements**

Y. Zhou (University of Science & Technology Beijing, China), L.M. Sun (Tongji University, China), W.W. Wang (Qinghai Local Railway Construction Investment Co., Ltd., China)

**3:05pm-3:20pm** A study on simple design method of hybrid control system about dynamic mass mode control system with oildamper

W. Han, T. Furuhashi (Nihon University, Japan), Y. Tsuda (Sumitomo Mitsui Construction Co. Ltd., Japan), X. Zhou, H. Nishimura (Nihon University, Japan)

**Developing neutral equilibrium control device to enhance seismic capacity of building**

W.P. Sung (National Chin-Yi University of Technology, Taiwan, China), M.H. Shih (National Chi Nan University, Taiwan, China)

**Study on the buffeting performance and its influence factors of the long-span quadruple-tower suspension bridge**

H. Wang, C.Y. Yao, T.Y. Tao, M. Yang (Southeast University, China)

**Intelligent concrete with self-x capabilities**

Z. Li, B.G. Han, J.P. Ou (Dalian University of Technology, China)

**3:20pm-3:35pm** Active structural control focusing on absolute acceleration based on extended equivalent-in-put-disturbance approach

K. Miyamoto, D. Sato, J. She (Tokyo University of Technology, Japan)

**Passive structural control using a one-way rotational inertia damper**

A. Javidialesadi, N.E. Wierschem (University of Tennessee, USA)

**Characteristic test of hybrid electromagnetic damper for cable vibration reduction**

S.K. Kyea, H.S. Kim (Korea Advanced Institute of Advanced Science and Technology, Korea), H.Y. Jung (Hyundai Construction Equipment Co., Korea), H.J. Jung (Korea Advanced Institute of Advanced Science and Technology, Korea)

3:35pm - 3:50pm

Coffee break

## Concurrent Sessions 1 (Shangri-La Hotel)

Session 1.5 - Room: Function Room 22

SS01(1): Recent Research Advances on Structural Control and Health Monitoring in Australia

Chairs: Kaiming Bi; Shuaishuai Sun

**Invited paper: Development of magnetorheological elastomers based tuned mass damper for building protection**  
W.H. Li, S.S. Sun, J. Yang (University of Wollongong, Australia)

Session 1.6 - Room: Function Room 24

SS02(1): Research Advances in SHM: Chinese Experiences

Chairs: Hongnan Li; Tinghua Yi;

**Invited paper: Structural damage detection based on deep learning**  
Y.X. Wang, X.R. Ma, Z.H. Nie, Y.Z. Lin, (Jinan University, China), H.W. Ma (Jinan University, China; Dongguan University of Technology, China)

Session 1.7 - Room: China Hall 2

SS20(1): Bayesian Inference and Uncertainty Quantification in Structural Health Monitoring: New Algorithms and Applications

Chairs: Yong Huang, James L. Beck

**Invited paper: Uncertainty quantification in the failure forecast method**  
M.D. Todd (University of California San Diego, USA), M. Leung, J. Corcoran (Imperial College London, UK)

Session 1.8 - Room: Function Room 31

SS13: Structural Control and Monitoring of Wind Turbine Structures

Chairs: Ningsu Luo; Wensong Zhou

**Active generator control of tower and spar vibrations of spar-type floating offshore wind turbines**  
Z.L. Zhang, C.E. Høeg (Aarhus University, Denmark), B. Basu (Trinity College Dublin, Ireland), S.R.K. Nielsen (Aalborg University, Denmark)

**1:50pm - 2:05pm** Influence of mass ratio on the effectiveness of using PIP system for VIV control

H.M. Nikoo, K.M. Bi, H. Hao (Curtin University, Australia)

**Automated modal identification based on eigensystem realization algorithm**

X.M. Yang, C.X. Qu, T.H. Yi (Dalian University of Technology, China), H.N. Li (Shenyang Jianzhu University, China)

**A Bayesian source separation method for noisy observations by embedding Gaussian process**

C.Xu, Y.Q. Ni (The Hong Kong Polytechnic University, China)

**Multiple defect size estimation of rolling bearings using autonomous diagnosis and vibrational jerk**

M.A.A. Ismail (DLR (German Aerospace Center), Germany), A. Klausen (University of Agder, Norway)

**2:05pm - 2:20pm** Variable stiffness MR device for structural vibration sup-pressure under earthquake event: nonlinear modeling and semi-active control

Y. Yu, S. Royel, Y.C. Li, J.C. Li, X.Y. Gu (Western Sydney University, Australia), Q. Hua (University of Technology Sydney, Australia)

**A new method for structural modal identification using sparse component analysis**

X.J. Yao, C.X. Qu, T.H. Yi (Dalian University of Technology, China), H.N. Li (Shenyang Jianzhu University, China)

**Sequential Bayesian compressive sensing**

Y. Huang, Y.L. Ren (Harbin Institute of Technology, China), J.L. Beck (Caltech, USA), H. Li (Harbin Institute of Technology, China)

**Machine learning techniques for wind turbine fault diagnosis**

Y. Vidala, F. Pozo (Universitat Politècnica de Catalunya, Spain), N. Luo (University of Girona, Spain), C. Tutiven, J. Rodellar (Universitat Politècnica de Catalunya, Spain)

**2:20pm - 2:35pm** Building protection from seismic events using stiffness softening MRE isolators  
S.S. Sun, W.H. Li, J. Yang (University of Wollongong, Australia)

Experimental research on stress detection of short steel strands based on LC oscillation  
C. Tu, H. Zhang, B.N. Zhang (Chongqing Jiaotong University, China)

A hybrid electrical impedance tomography Smart graphene film based on FBG sensor for on-line icing monitoring and de-icing of wind turbine blade  
G. Yan (Nanjing University of Aeronautics & Astronautics, China), H. Sun (University of Pittsburgh; Massachusetts Institute of Technology, USA), Z. Yang (Nanjing University of Aeronautics & Astronautics, China)  
Y.B. Guo, Y.Q. Bao (Harbin Institute of Technology, China)

**2:35pm - 2:50pm** Using multiple tuned mass dampers to mitigate out-of-plane vibrations of offshore wind turbines  
H.R. Zuo, K.M. Bi, H. Hao (Curtin University, Australia)

Debonding detection for rectangular CFSFs based on controlled acoustic reflection  
N. Yang, Y. Lei (Xiamen University, China)

A model for bridge vehicular flow based on vehicular in-flow and load effect measurements  
H.Q. Mu (South China University of Technology, China), S. Wu (The Institute of Statistical Mathematics, Japan), H.Z. Guo, T.Y. Zhang (South China University of Technology, China)

Icing detection on wind turbine blade using distributed fiber optic sensors  
Z.H. Zhang, W.S. Zhou, H. Li (Harbin Institute of Technology, China)

**2:50pm - 3:05pm** Effectiveness of tuned heave plate inerter (THPI) to control heave motion of offshore semi-submersible platform (SSP)  
K.M. Bi, R.S. Ma, H. Hao (Curtin University, Australia)

Method on crack damage of reinforced concrete beam based on numerical simulation of EDEM and experiment  
X.Y. Zheng (Shandong University, China; Shijiazhuang Tiedao University, China), Y. Gao (Shijiazhuang Tiedao University, China), Y.J. Jiang (Nagasaki University, Japan), Q. Zhang, F. Xu (Shijiazhuang Tiedao and Technology, China)

Optimal sensor configuration for model identification of periodic structures based on information entropy  
T. Yin (Wuhan University, China), K.V. Yuen (University of Macau, China), H.F. Lam (City University of Hong Kong, China), H.P. Zhu (Huazhong University of Science and Technology, China)

Harmonic balance analysis of mooring cables  
L. Chen, B. Basu (Trinity College Dublin, Ireland), S. Nielsen (Aalborg University, Denmark)

**3:05pm-3:20pm** Tanh model-based force tracking scheme for MR dampers and its implementation in opensees  
S.L. Wei, J. Wang (Harbin Institute of Technology, China)

Modal parameter identification of structures with closely spaced modes using an improved HHT method  
T.L. Huang, X. Wan, N.B. Wang (Central South University, China), M.L. Lou (Tongji University, China), H.P. Chen (University of Greenwich, UK)

Bayesian operational modal analysis using auto-regressive model  
J.H. Yang (Tongji University, China), H.F. Lam (City University of Hong Kong, China)

**3:20pm-3:35pm** Bifurcation control of a duffing oscillator using fuzzy logic control method  
K.A. Baghaei, R. Mahmoudi, H. Ghatfarzadeh (University of Tabriz, Iran)

In-service stress monitoring of steel cables and prestressing tendons using EME sensors  
R. Zhang (Zhejiang University City College, China), Y.F. Duan (Zhejiang University, China), S.W. Or (The Hong Kong Polytechnic University, China), Y. Zhao (Zhejiang University City College, China);

Sensitivity of stiffness condition assessment results to unscented Kalman filter initial parameters  
M. Kuleli, T. Nagayama (The University of Tokyo, Japan)

3:35pm - 3:50pm

Coffee break

## Concurrent Sessions 1 (Shangri-La Hotel)

Session 1.9 - Room: Function Room 32

SS14(1): Recent Advances in Sensing Technology for Structural Health Monitoring

Chairs: Yongkang Dong; Qian Feng

**1:30pm - 1:50pm** Invited paper: Crack detection in orthotropic steel decks of a real cable-stayed bridge using guided wave dipole array

W.S. Zhou, P. Wang, H. Li (Harbin Institute of Technology, China)

**1:50pm - 2:05pm** Online decimation for wireless smart sensing

S. Zhou, K.A. Mechitov, Y. Fu, B.F. Spencer (University of Illinois at Urbana-Champaign, USA)

**2:05pm - 2:20pm** 150km single-shot BOTDA sensor based on optical chirp chain technique and Brillouin loss scheme

B.Z. Wang, S. Diakaridia, C. Pang, Y.K. Dong (Harbin Institute of Technology, China)

Session 1.10 - Room: Function Room 27

SS15: Infrastructure Inspection Using Unmanned Aerial and Ground Vehicles

Chairs: Hoon Sohn; Hyung Jo Jung

Invited paper: Image-based spalling detection of concrete structures incorporating deep learning

Y. Lee, B. Kim, S. Cho (University of Seoul, Korea)

Localization of an unmanned aerial vehicle under bridges

S. Jung, S. Song, T. Oh, H. Myunga (Korea Advanced Institute of Science and Technology (KAIST), Korea)

Session 1.11 - Room: Function Room 25

SS19(1): Structural Health Monitoring with Multi-data

Chairs: Do Hyoung Shin; Sung-Han Sim

Invited paper: Vibration test for suspended footbridge and damping identification

H.K. Kim, S. Kim, W.H. Jung, D. Hwang (Seoul National University, Korea), W. Park (Mokpo National University, Korea), E.S. Hwang (Kyung Hee University, Korea), C.Y. Kim (Myoungji University, Korea), J.H. Jang (TMENC Co. Ltd., Korea)

Evaluation of in-service bridge assessment methodology using decommissioned concrete bridges

M. Kim, N. Lee, J.H. Lee, J.Y. Cho (Seoul National University, Korea), J.S. Kim (Seo Kyeong University, Korea)

Damage identification of bridges using equivalent neutral axis obtained by multi-sensor data fusion

J.W. Park (Chung-Ang University, Korea), D.S. Moon, B.F. Spencer (University of Illinois at Urbana-Champaign, USA), S.H. Sim (Ulsan National Institute of Science and Technology, Korea)

Session 1.12 - Room: China Hall 3

SS16(1): Innovations in Computer Vision for Structural Monitoring and Damage Detection

Chairs: Mohammad Jahanshahi; Chul Min Yeum

Invited paper: Context-aware deep-learning approach to damage recognition for automated building inspections

V. Hoskete, B. F. Spencer Jr (University of Illinois at Urbana-Champaign, USA)

Automated detection of pre-disaster building images from google street view

C.M. Yeum, A. Lenjani, S.J. Dyke, I. Bilionis (Purdue University, USA)

Site verification tests for UAV bridge inspection and damage image detection based on deep learning

J. Dang, A. Shrestha, D. Haruta, Y. Tabata (Saitama University, Japan), P. Chun, K. Okubo (Ehime University, Japan)

- 2:20pm - 2:35pm** Characterization of concrete damage using UAV applicable line laser thermography for imaging of coating thickness and corrosion area in steel structures  
 C.L. Yang, J. Chen (Beihang University, China)  
 S. Hwang, J. Park, Z. Jin, H. Sohn (Korea Advanced Institute of Science and Technology (KAIST), Korea)
- 2:35pm - 2:50pm** Ultrasonic guided wave propagation properties for under-ground layered pipeline structures  
 Y. Li (Dalian University of Technology; Shenyang Jianzhu University, China), S. Yan (Dalian University of Technology; Shenyang Jianzhu University, China), B. W. Zhang (Shenyang Jianzhu University, China) et al.
- 2:50pm - 3:05pm** Design and numerical simulation of parted crack sensor based on patch antenna  
 K.Q. Xu, L. Y. Xie (Tongji University, China), S. T. Xue (Tongji University, Japan) Nippon Institute of Technology, Japan)
- 3:05pm-3:20pm** Smart OF-based components for civil infrastructures  
 Z. Zhou, Y.W.S Chan (Dalian University of Technology, China), J.P. Ou (Dalian University of Technology, China; Harbin Institute of Technology, China)
- 3:20pm-3:35pm** Structural health monitoring for concealed engineering of urban infrastructure using piezoceramic-based transducers  
 Q. Feng (Institute of Seismology; Institute of Engineering Mechanics, CEA, China), Y.B. Liang, J. Jiang (Institute of Seismology, CEA, China)
- 2:20pm - 2:35pm** Bayesian hypothesis testing for bridge health monitoring  
 Y. Goi, C.W. Kim (Kyoto University, Japan)
- 2:35pm - 2:50pm** Methodology for the damage detection of aging bridges based on multi-data and deep learning  
 K.H. Lee, J.H. Park, M.W. Jung, D.H. Shin (Inha University, Korea)
- 2:50pm - 3:05pm** SHM for civil structures based on statistical models  
 Y. Kim, S. Shin (Inha University, Korea)
- 3:05pm-3:20pm** Real-time roadside sign detection using RCNNs on low-power high-performance portable computer  
 G. Leon (University of Central Florida, USA), H.K. Kim (National Assembly Member's Office of Korea, Korea), H.B. Yun (University of Central Florida, USA)
- 3:20pm-3:35pm** Advancement and accuracy evaluation of automatic damage detection algorithm for concrete bridge deck by ground penetrating radar  
 T. Mizutani, T. Yamaguchi, A. Sakaguchi (The University of Tokyo, Japan), M. Tarumi (Management Integrated Laboratory Co. Ltd., Japan), T. Nagayama (The University of Tokyo, Japan)
- 3:35pm-3:50pm** UAV-based fatigue damage sensing for steel bridges through image feature matching and geometric transformation  
 X.X. Kong, S.A. J. Li (The University of Kansas, USA)
- 3:50pm-4:05pm** Accurate and robust 3D scene reconstruction in the presence of misassociated features for aerial situational awareness  
 M.R. Jahanshahi, F.C. Chen (Purdue University, USA), A. Ansar, C.W. Padgett, D. Clouse, D.S. Bayard (California Institute of Technology, USA)
- 4:05pm-4:20pm** Full-field structural vibration monitoring and system identification using deep learning and optical flow  
 C.Z. Dong, O. Celik, F.N. Catbas (University of Central Florida, USA)
- 4:20pm-4:35pm** Structural health monitoring and damage detection techniques: numerical and experimental case studies  
 R. Ditommaso, C. Iacovino (University of Basilicata, Italy), M.P. Limongelli (Polytechnic University of Milan, Italy), F.C. Ponzio (University of Basilicata, Italy), D. Spina (National Civil Protection, Italy)
- 4:35pm-4:50pm** Automated crack detection from large volume of concrete images using deep learning  
 B. Kim, S. Cho (University of Seoul, Korea)
- 4:50pm-5:05pm** Deep Learning and Bayes Data Fusion for Crack Detection  
 F.C. Chen, M.R. Jahanshahi (Purdue University, USA)



3:35pm - 3:50pm

Coffee break

## Concurrent Sessions 1 (Shangri-La Hotel)

Session 1.13 - Room: Function Room 33

**SS12: Structural Monitoring and Control of High-speed Railway**

Chairs: Yiqing Ni; Xiaowei Ye

**1:30pm - 1:50pm** Invited paper: Experimental study of the effect of MR-damper on high-speed train bogie

Y.Q. Ni, S.M.S. Alehashem (The Hong Kong Polytechnic University, China)

Session 1.14 - Room: Function Room 34

**SS34: Dense Arrays of Sensors, Distributed and Quasi-Distributed Sensors, and Associated Data Analysis and Management**

Chairs: Branko Glisic; Daniele Zonta

Invited paper: Wave propagation characterization using seismic interferometry for occupant localization

using **footstep-induced floor vibrations**  
M. Mirshekari, S.J. Pan, J. Fagert, P. Zhang (Carnegie Mellon University, USA), H. Sun (University of Pittsburgh, USA), H.Y. Noh (Carnegie Mellon University, USA)

Session 1.15 - Room: Chairman Room

**SS22(1): Uncertainty-Involved Structural Model Updating, Damage Assessment and Reliability Evaluation**

Chairs: Gang Liu; Shengen Fang

Invited paper: Algorithm for integration of structural damage identification and reliability evaluation based on response moments

Y. Lei, X.Y. Li (Xiamen University, China)

Session 1.16 - Room: Function Room 35

**SS23(1): Vehicle-Bridge Interaction and Its Applications in Bridge-Weigh-in-Motion (BWIM), Damage Detection, and Bridge Management**

Chairs: Steve C.S. Cai; Lu Deng

Invited paper: Aerodynamic characteristics and running safety of the high-speed train moving on a truss bridge

X.Z. Li, M. Wang, L.F. Xin, Q.Y. Zou (Southwest Jiaotong University, China)

**1:50pm - 2:05pm** Track profile estimation using inverse analysis from multi-body simulation approach

T.J. Saravanan, D. Su (The University of Tokyo, Japan), H. Tanaka (Railway Technical Research Institute, Japan), T. Nagayama (The University of Tokyo, Japan)

Estimation of error in deformed shape determined using double integration of curvature

D. Sigurdardottir (Ramboll, Sweden), B. Glisic (Princeton University, USA)

**2:05pm - 2:20pm** Hybrid BOTDA/FBG sensor for potential railway slope condition monitoring

E. Li, H.B. Xu, W.G. Zhao, Y.L. Du (Shijiazhuang Tiedao University, China)

Bayesian posterior distribution uncertainty of model parameters considering varying input seismic characteristics

H.Q. Wang, T. Nagayama, D. Su (The University of Tokyo, Japan)

Seismic response control in structures via damage modelling of hysteretic energy dissipative devices

C. Dávalos, G. Cano, A. López, I. Alvarado (Universidad Autónoma de Ciudad Juárez, México), M. Nishio (Yokohama National University, Japan)

Optimal data collection of MR-MC wireless sensors net-work for structural monitoring applications

Q. Li, Z. Chen, L. Wu (Fuzhou University, China)

Numerical study on effects of traffic flow patterns and road surface roughness on bridge dynamic responses

H.T. Ho, M. Nishio (Yokohama National University, Japan)

- 2:20pm - 2:35pm** **Improve ride comfort of high-speed trains using re-centering negative stiffness dampers**  
X. Shi, (China University of Petroleum (East China); The Hong Kong Polytechnic University, China) S. Zhu, Y. Q. Ni (The Hong Kong Polytechnic University, China), J. Li (University of Technology Sydney, Australia)
- 2:35pm - 2:50pm** **Online wheel tread defect detection for high-speed trains using bayesian approach**  
X.Z. Liu, Y. Q. Ni (The Hong Kong Polytechnic University, China)
- 2:50pm - 3:05pm** **Non-contact absolute stress measurement in rail using photoluminescence piezospectroscopy: laboratory and field studies for high-speed rail tracks**  
H.B. Yun (University of Central Florida, USA)
- 3:05pm-3:20pm** **Low-cost wireless smart sensors for measuring real-time reference-free dynamic displacements of railroad bridges**  
I. Ozdagli (University of New Mexico, USA), B. Liu (Institute of Disaster Prevention, China), F. Moreu (University of New Mexico, USA)
- 3:20pm-3:35pm** **Lifecycle fatigue damage assessment of existing bridges considering maintenance schemes**  
J. Zhu (University of Connecticut, USA), M.X. Wu (Southwest Petroleum University, China), W. Zhang (University of Connecticut, USA)
- Effect of deep learning prediction accuracy on sensor fault detection**  
L.L. Li, G.Liu, L.L. Zhang, Q. Li (Chongqing University, China)
- Probabilistic analysis and design of piezoelectric energy harvesting devices under modulated and filtered white Gaussian noise**  
G. Quaranta (Sapienza University of Rome, Italy), F. Trentadue (Technical University of Bari, Italy), C. Maruccio (University of Salento, Italy) et al.
- Response covariance-based multi-objective multi-type sensor placement for structural damage detection**  
J.F. Lin, Y.L. Xu (The Hong Kong Polytechnic University, China)
- Risk-informed serviceability management strategy for long-span bridges in wind-prone areas considering vehicle-bridge-wind interactions**  
Y. Zhou (SOH Wind Engineering, Colorado State University, USA), S. Chen (Colorado State University, USA)
- Structural response reconstruction using limited measurements with Substructuring**  
X.H. Zhang, H.Y. Zhou (Fuzhou University, China)
- Coupled vibration analysis of train-track-bridge system under winds: a structural periodicity-based efficient precise integration method**  
K. Shi (Central South University, China; University at Buffalo, USA), X.H. He (Central South University, China), T. Wu (University at Buffalo, USA)
- High order perturbation method based statistical model updating using modal data**  
H. Chen, B. Huang, Y.M. Witri (Wuhan University of Technology, China)
- Dynamic response estimation of bridge structures using the hybrid monitoring method**  
Y.X. Li, L.M. Sun, W. Zhang (Tongji University, China)
- Structural damage identification based on extended ellipsoidal outer-bounding set-membership estimation**  
Y. Han, C. Zhang, G.Q. Song (Nanchang University, China)
- Numerical analysis of vehicle impact factors of continuous beam bridges and on-site tests data survey**  
Q. Hu, Z. Sun (Tongji University, China)
- Research on bayesian finite element model updating method based on multiple markov chains**  
W. Jiang (Chongqing University, China)

**3:35pm - 3:50pm**

**Coffee break**

**Concurrent Sessions 1 (Shangri-La Hotel)**

**Session 1.17 - Room: Function Room 26****SS21: Sparse Recovery Technique in SHM**

Chairs: Zhongdong Duan; Yong Xia

**Invited paper: Experimental study on structural damage quantification based on EMI sensitivity and sparse regularization**  
J. Li, X.Y. Fan, H. Hao (Curtin University, Australia)

**Invited paper: Spurious mode distinguish by eigensystem realization algorithm through moving data**  
 C.X. Qu, T.H. Yi (Dalian University of Technology, China), Q. Feng (China Earthquake Administration, China), H.B. Liu (National Engineering Laboratory for Port Hydraulic Construction Technology, China)

**Session 1.18 - Room: Function Room 36****SS27: Monitoring-based Life Cycle Assessment of Infrastructures**

Chairs: Chunxu Qu; Donghui Yang

**Invited paper: Analysis and early warning of girder deflections of a steel-truss arch railway bridge based on monitoring and FE modeling**  
 Y.L. Ding, H.W. Zhao (Southeast University, China), S. Nagarajaiah (Rice University, USA), S. Nagarajaiah (Rice University, USA), A.Q. Li (Beijing University of Civil Engineering and Architecture, China)

**Session 1.19 - Room: Function Room 37****SS28: Monitoring-based Bridge Condition Assessment and Safety Warning**

Chairs: Youliang Ding; Yang Deng

**1:50pm - 2:05pm** **Regularization parameter selection for L1-regularized damage identification**  
 R.R. Hou, Y. Xia (The Hong Kong Polytechnic University, China)

**2:05pm - 2:20pm** **Wireless sensor network based on compressed sensing for structural health monitoring**  
 L. Sun, B. Sun (Tianjin University, China)

**2:20pm - 2:35pm** **Modeling and harnessing sparse and low-rank features in structural dynamics and health monitoring data**  
 Y.C. Yang (Los Alamos National Laboratory, USA), S. Nagarajaiah (Rice University, USA)

**2:35pm - 2:50pm** **Modal analysis from compressed measurements using the multivariate AR model**  
 J. Kang, Z.D. Duan (Harbin Institute of Technology, Shenzhen, China)

**Vibration control of bundled conductors with an innovative pounding spacer damper**

X. Fu, J. Wang, H.N. Li (Dalian University of Technology, China)

**Monitoring and analysis of thermal effect on tower displacement in cable-stayed bridge**

D.H. Yang, T.H. Yi (Dalian University of Technology, China), T.J. Liu (Harbin Institute of Technology, China), Y. Gao (Shijiazhuang Tiedao University, China)

**Seismic fragility analysis of buckling-restrained braced CFST frame Structures under the main shock-aftershock sequences**

S.M. Jiang, H. Zhang, G.D. Liu (Shenyang Jianzhu University, China)

**A deep reinforcement learning paradigm for bridge maintenance policies**

S.Y. Wei, H. Li (Harbin Institute of Technology, China)

**Reliable bridge health monitoring and safety estimation based on structural design**

X.W. He (Bridge and Tunnel R&D Base of Dalian University of Technology, China)

**Feasibility of in situ displacement and acceleration measurements to identify bridge steel bearing malfunction**

H.A. Waqas, D. Su, T. Nagayama (The University of Tokyo, Japan)

**Dynamic response of long-span railway cable-stayed bridge to running train**

Y.Z. Liu, T.H. Yi, H.N. Li (Dalian University of Technology, China)

**Multi-rate Kalman filtering for the data fusion of displacement and acceleration in structural health monitoring system for bridge**

Y. Wang, T.H. Yi, H.N. Li (Dalian University of Technology, China)

**2:50pm - 3:05pm** Comparative studies on damage identification with Tikhonov regularization and sparse regularization  
 C.D. Zhang, (The Hong Kong Polytechnic University, China)

Seismic response analysis of prefabricated dissipation shear wall under main aftershock sequences  
 Z.F. Wang, H. Zhang, G.D. Liu (Shenyang Jianzhu University, China)

Time-dependent reliability analysis of bridges based on long-term strain data  
 Y.X. Xia (Qingdao University of Technology, China), Y.Q. Ni (The Hong Kong Polytechnic University, China)

**3:05pm-3:20pm** L1 regularized model updating for structural damage detection  
 Y.H. Wu, X.Q. Zhou (Shenzhen University, China), Y. Xia (The Hong Kong Polytechnic University, China)

Long-term structural health monitoring of an office building based on a recursive stochastic subspace identification algorithm  
 W.H. Wu, J.W. Jhou, C.C. Chen, G. Lai (National Yunlin University of Science and Technology, Taiwan, China)

Structural health monitoring of high-speed railway bridges in China: a state-of-the-art review  
 F.Yang, Y.L. Ding (Southeast University, China), A.Q. Li (Beijing University of Civil Engineering and Architecture, China), H.W. Zhao (Southeast University, China)

**3:20pm-3:35pm**

Seismic reliability analysis of urban water network system considering interdependency effect of substation  
 S.S. Yoon, H.J. Jung (Korea Advanced Institute Science and Technology, Korea)

Ultra low power smart wireless sensor with event based operation  
 M.Z. Sarwar, J.B. Won, J.W. Park (Chung-Ang University, Korea)

**3:35pm - 3:50pm**

Coffee break

## Concurrent Sessions 2 (Fuxin Hotel)

**Session 2.1 - Room: 117**

SS03(2): Application, Research and Design on Structural Control in Japan

Chairs: Takeshi Furuhashi; Hideo Fujitani  
 Invited paper: Development of high-capacity oil damper for structural control of tall buildings  
 M. Yamamoto, S. Minewaki, T. Sone (Takenaka Corporation, Japan), M. Nakahara, Y. Tsuyuki (Kayaba System Machinery Co. Ltd., Japan)

**Session 2.2 - Room: 223**

SS04(2): New Development of Smart Devices for Structural Control

Chairs: Jian Li; Jianchun Li  
 Invited paper: Infrastructure cyber-care: challenges for cyber-systems, robotics and data analytics  
 C. Xu (Zhejiang University, China)

**Session 2.3 - Room: 125**

SS09(2): Wind Effects and Wind-Induced Vibration Control for Large-Scale Structures

Chairs: Hao Wang; Xin Chen  
 Invited paper: Identification and control of vortex-induced vibrations of a suspension bridge from monitoring data  
 X.G. Hua, R.F. Shun, Z.Q. Chen, Q. Wen, H.W. Niu (Hunan University, China)

**Session 2.4 - Room: 221**

SS05: Structural Control of Bridges under Earthquake or Multiple Hazards

Chairs: Qiang Han; Anxin Guo  
 Invited paper: Research of Vibration Reduction Technologies for Long-Span Bridges  
 B. Wang, Z.X. Wang (State Key Laboratory for Health and Safety of Bridge Structures, Railway Bridge Science Research Institute Ltd, China)

- 4:10pm - 4:25pm** **Base-isolated building with new-type oil damper for long-period and huge ground motion**  
 Y. Hibako (Kayaba System Machinery Co. Ltd., Japan)  
**Optimization of actuator placement for vibration damping in the Prestress-Accumulation Release control approach**  
 B. Poplawski, G. Mikulowski, G. Suwata, L. Jankowski (Institute of Fundamental Technological Research, Polish Academy of Sciences, Poland)
- 4:25pm - 4:40pm** **Experimental research on development of new oil damper with spring for architectural vibration control and analytical research about actual building**  
 H. Ashida, O. Takahashi (Tokyo University of Science, Japan), A. Yokoyama (Sanwa Tekki Corporation, Japan), L. Shu (Tianjin University, China)
- 4:40pm - 4:55pm** **Application of structural control to seismic retrofit of Tokyo Tower**  
 N. Kashimoto, H. Kunitsu (Nikken Sekkei Ltd., Japan)
- 4:55pm - 5:10pm** **Seismic control system of tensile brace and friction damper combination**  
 H. Hirata, S. Gokan, Y. Utsumi, J. Nomura, T. Sano (Obayashi Corporation, Japan), T. Hotta (JR Central Consultants Company, Japan)
- 5:10pm - 5:25pm** **Feasibility study of passive energy dissipation devices for the seismic protection of low-frequency structures**  
 H. Luo (Tohoku University, Japan), C. Chong (Guangzhou University, China), H. Higano, K. Ikgao, N. Inoue (Tohoku University, Japan)
- Harmonic wavelets based evolutionary power spectral densities estimation on the buffeting responses of Sutong Bridge during Typhoons**  
 H. Wang, Z.D. Xu, Y.Q. Gao (Southeast University, China)
- Seismic performance of a spatially irregular long span cable-stayed bridge in Beijing**  
 Q. Han, X. Zhang, K. Xu, X.L. Du (Beijing University of Technology, China)
- Theoretical and experimental study on wind-induced vibration control of self-standing slender structures using vibration absorbers**  
 X. Chen, Y.Q. Zhu (Suzhou University of Science and Technology, China), H. Wang, A.Q. Li (Southeast University)
- Semi-active stiffness-controllable mass damper system with least energy control method**  
 S.Y. Chu, L.Y. Lu (National Cheng Kung University, Taiwan, China), S.W. Yeh (National Center for Research on Earthquake Engineering, Taiwan, China), C.T. Chien (Ministry of Transportation and Communications, Taiwan, China)
- Study on dynamic response method and characteristics of large scale wind turbine under typhoon**  
 L. Wang, R. Han, T.G. Wang (Nanjing University of Aeronautics and Astronautics, China)
- Wind effect about unstable wind**  
 P. Liu (Jiangsu University of Science and Technology, China)
- Bi-directional response mitigation of offshore wind turbines under multiple hazards**  
 C. Sun, V. Jahangiri (Louisiana State University, USA), H. Sun (Xi'an Research Institute Co. Ltd. of China Coal Technology & Engineering Group, China)
- Oblique wave forces acting on coastal bridges during hurricanes**  
 Q.H. Fang, R.C. Hong, X.T. Wu, A.X. Guo (Harbin Institute of Technology, China)
- Study on multiple accelerated oscillator damper system and parametric optimization**  
 Y.G. Tan, J.Z. Zhou, Z. Zhang (Dalian University of Technology, China)
- Risk assessment and mitigation of coastal highway bridges vulnerable to hurricanes considering climate change**  
 Y.H. Li, Y. Dong (The Hong Kong Polytechnic University, China)
- Active vibration control of stay cable with macro-fiber composite**  
 J.W. Tu, J.R. Zhang, W.L. Qu (Wuhan University of Technology, China)

**5:25pm - 5:40pm** Development of a seismic isolation floor using thin steel plates with a restoring mechanism

K. Sugimoto, A. Fukukita, Y. Kitamura, K. Isoda (Shimizu Corporation, Japan)

A new tunable friction pendulum system for semi-active control of base-isolated structures under earthquake ground motions

P. Pan, D.B. Zhang (Tsinghua University, China)

Spatial correlation-based WRF observation-nudging approach in simulating regional wind field

H.H. Ren, S.J. Laima, W.L. Chen, A.X. Guo, C. Huang (Genex Systems / Turner Fairbank Highway Research Center, USA), J.C. Qi (University at Buffalo, The State University of New York, USA), N.S. Zhang (Genex Systems / Turner Fairbank Highway Research Center, USA) et al.

Development of a database framework for modelling damaged bridges under multiple hazards

C. Huang (Genex Systems / Turner Fairbank Highway Research Center, USA), J.C. Qi (University at Buffalo, The State University of New York, USA), N.S. Zhang (Genex Systems / Turner Fairbank Highway Research Center, USA) et al.

**5:40pm - 5:55pm** A novel connected control system applicable to a single building by dividing it into four internally

T. Watanabe, H. Hirata (Nihon University, Japan), K. Seto (Seto Certified Engineer's Office, Japan)

A preliminary study on adaptive tuned mass damper with variable mass

L.K. Wang, W.X. Shi, Y. Zhou (Tongji University, China)

Nonlinear static wind stability analysis on triple-tower twin-span suspension bridge with tie cables

L.B. Wang, B.H. Jin, P.Z. Wang (Nanjing Forestry University, China)

Collision analysis of artificial reefs during their employment on the seabed

M. Kim, D. Kim, S. Jung, W.B. Na (Pukyong National University, Korea)

**5:55pm - 6:10pm** Proposal of a new seismic response control system using block & tackle

T. Saito (Toyoohashi University of Technology, Japan), S. Sakai (Hazama Ando Corp., Japan), T. Maegawa (Kumagai Gumi Co. Ltd., Japan), E. Nishimura (Toda Corporation, Japan), M. Uchikawa (Sato Kogyo Co. Ltd., Japan), M. Kamagawa (Nishimatsu Construction Co. Ltd., Japan) et al.

An adaptive strategy for reducing stroke of tuned mass dampers with variable degrees of freedom

J.F. Wang (National United University, Taiwan, China), C.C. Chang (National Applied Research Laboratories, Taiwan, China)

Seismic response reduction of the fully jointless semi-integral bridge

Y.C. Ma, X.D. Shao, J.J. Wang (Hunan University of Technology, China)

## Concurrent Sessions 2 (Shangri-La Hotel)

**Session 2.5 - Room: Function Room 22**

SS01(2): Recent Research Advances on Structural Control and Health Monitoring in Australia

Chairs: Jun Li; Yancheng Li

**Session 2.6 - Room: Function Room 24**

SS02(2): Research Advances in SHM: Chinese Experiences

Chairs: Zhiwei Chen; Liang Ren

**Session 2.7 - Room: China Hall 2**

SS20(2): Bayesian Inference and Uncertainty Quantification in Structural Health Monitoring: New Algorithms and Applications

Chairs: Heung Fai (Paul) Lam; Stephen Wu

**Session 2.8 - Room: Function Room 31**

SS17: Computer Vision-based Sensing and System Identification

Chairs: Zhu Mao; Yuequan Bao

- 3:50pm - 4:10pm** **Invited paper: Numerical studies on using deep sparse autoencoders for damage identification of structures**  
L. Li, Y. Xin, H. Hao (Curtin University, Australia)  
L. Li, H. Hao, J. Li, C.S.N. Pathirage, W.Q. Liu, R. H. Wang (Curtin University, Australia)
- 3:50pm - 4:10pm** **Invited paper: Statistical analysis of three dimensional thermal gradients for wide girders of arch bridge**  
T.H. Yi (Dalian University of Technology, China), G.D. Zhou (Hohai University, China), J.L. Beck (California Institute of Technology, USA)
- 3:50pm - 4:10pm** **Invited paper: Bayesian operational modal analysis based on modal component sampling**  
H.F. Lam (City University of Hong Kong, China), J.H. Yang (Tongji University, China), J.L. Beck (California Institute of Technology, USA)
- 3:50pm - 4:10pm** **Invited paper: Sub-nyquist full-field imaging of structural dynamics from digital videos**  
Y.C. Yang, C. Farrar, D. Mascarenas (Los Alamos National Laboratory, USA)
- 4:10pm - 4:25pm** **An improved empirical wavelet transform approach for modal identification of structures**  
J. Li, Y. Xin, H. Hao (Curtin University, Australia)
- 4:10pm - 4:25pm** **Operational modal analysis using power spectrum density transmissibility (PSDT): experimental verification**  
L.B. Cao, Q. Sun, W.J. Yan, W.X. Ren (Hefei University of Technology, China)
- 4:10pm - 4:25pm** **Uncertainty quantification for transmissibility functions utilizing an efficient numerical method**  
M.Y. Zhao, W.J. Yan, W.X. Ren (Hefei University of Technology, China)
- 4:25pm - 4:40pm** **Real-time structural damage identification, using a three-step algorithm based on self-adaptive recursive least square approach and curvature change technique**  
M. Askari, B. Samali, C.W. Zhang (Western Sydney University, Australia; Qingdao University of Technology, China), X.Y. Gu (Western Sydney University, Australia)
- 4:25pm - 4:40pm** **Study on improving methods of matching of aeolian sand roadbed in alpine region and quality control measures of embankment**  
R.Z. You, L. Ren (Dalian University of Technology, China), G.B. Song (University of Houston, USA), J.J. Wang (Dalian University of Technology, China)
- 4:25pm - 4:40pm** **Bayesian model updating: present conceptual challenges and practical shortcomings**  
O. Sedehi, L. S. Katafygiotis (the Hongkong University of Science and technology, China), C. Papadimitriou (University of Thessaly, Greece)
- 4:25pm - 4:40pm** **A comparative study on 2D and 3D tracking of vibration via motion magnified high-speed videos**  
Y.Q. Bao, Z.Y. Tang, H. Li (Harbin Institute of Technology, China)
- 4:40pm - 4:55pm** **Numerical simulation of crack detection on key railway structures using guided waves**  
Y.F. Lee, Y. Lu, W.K. Chiu, I. Salehi (Monash University, Australia)
- 4:40pm - 4:55pm** **Numerical identification of multiple dispersive guided-wave modes in plate structures**  
B. Wu (Nanjing Tech University, China), Y. Huang, H. Li (Harbin Institute of Technology, China)
- 4:40pm - 4:55pm** **Structural dynamics characterization using video measurements and phase-based motion estimation (PME)**  
Z. Mao, A. Sarrafi (University of Massachusetts Lowell, USA)
- 4:55pm - 5:10pm** **Estimation of bridge frequency from the vibration measurements of a moving vehicle by using blind source separation technique**  
X.Q. Zhu, J.T. Li, B. Samali (University of Technology Sydney, Australia)
- 4:55pm - 5:10pm** **Probabilistic structural model updating using approximate Bayesian computing**  
Z. Feng, B. Zhao, G. Liu, Z. Chen (Human University, China)
- 4:55pm - 5:10pm** **Identification of interface mechanical behaviour of high-speed railway ballastless track using digital image correlation method**  
S.Y. Zhu, W. Zhai, C.B. Cai (Southwest Jiaotong University, China)
- 5:10pm - 5:25pm** **Reliability analysis of functionally graded beam structure using support vector machine**  
Y. Feng, Q. Y. Li, W. Gao (The University of New South Wales, Australia)
- 5:10pm - 5:25pm** **Fatigue performance assessment of hangers in a rigid tied arch bridge under train loads**  
W. Zhong, Y.L. Ding (Southeast University, China), Y.S. Song (Jinling Institute of Technology, China), H.W. Zhao (Southeast University, China)
- 5:10pm - 5:25pm** **Computer vision-based experimental study on dynamic properties of high-speed railway track structure**  
T. Jin, X.W. Ye (Zhejiang University, China)

**5:25pm - 5:40pm** Model free nonlinear behavior identification with unknown mass and partially unknown dynamic response  
J. Li, B. Xu (Huaqiao University, China)

Performance analysis of externally reinforced dayaoan bridge based on intelligent CFRP plate  
J.Y. Wang, Z. Zhou, Z.Z. Wang, (Dalian University of Technology, China), J.P. Gao (Dalian University of Technology Civil Engineering Design Institute Inc.), X.M. Wu (Hunan Provincial Highway Bridge Construction Corporation, China)

Seismic damage assessment of an E-Defense tested steel moment-resisting frame using hierarchical Bayesian model updating  
X. Li (Chongqing University, China), M. Kurata (Kyoto University, Japan)

Video-based robust identification approach for tower vibration of a cable-stayed bridge model under earthquake ground motions  
J. Zhao, H. Li (Harbin Institute of Technology, China)

**5:40pm - 5:55pm** Comparative assessment of linear quadratic algorithm between real and independent modal space  
S. Chakraborty (Indian Institute of Technology Kanpur, India), X.D. Ji (Tsinghua University, China)

Time reversal based rock bolt pre-load monitoring with active sensing approach using piezoceramic transducers  
D.D. Chen, L.S. Huo (Dalian University of Technology, China), G.B. Song (University of Houston, USA)

Performance updating of fatigue sensitive details under uncertainty  
Y. Dong (The Hong Kong Polytechnic University, China)

Inspection technology on the underwater pile foundation of bridge based on sonar image processing  
J.B. Luo, S.F. Jiang, S. Shen, Y.M. Zeng (Fuzhou University, China)

**5:55pm - 6:10pm** Shaking table test of pressurized fire sprinkler piping sub-systems  
Q.X. Shang, J.C. Li, W. Song, T. Wang (Institute of Engineering Mechanics, CEA, China)

Numerical study on the mechanism of interface debonding detection for CFST with surface wave measurement  
Z. Y. Zhuang, Bin Xu ( Huaqiao University, China), H.B. Chen ( Human University, China)

Fast Bayesian modal identification of structures using support excitation data  
X.W. Hu, C.T. Ng (The University of Adelaide, Australia)

Ultrasonic array time-reversal-based imaging for NDE  
C.G. Fan, L. Yang, Y. Chen, Y. Zhao (National University of Defense Technology, China)

### Concurrent Sessions 2 (Shangri-La Hotel)

**Session 2.9 - Room: Function Room 32**

SS14(2): Recent Advances in Sensing Technology for Structural Health Monitoring  
 SS36: Highway Infrastructure Monitoring

Chairs: Nizar Lajnef; Yun Zhou

**Session 2.10 - Room: Function Room 27**

SS07: Application and Testing of New Materials and Techniques in Semi-active Vibration Control

Chairs: Okyay Altay; Jinting Wang

**Session 2.11 - Room: Function Room 25**

SS19(2): Structural Health Monitoring with Multi-data

Chairs: Do Hyoung Shin; Sung-Han Sim

**Session 2.12 - Room: China Hall 3**

SS16(2): Innovations in Computer Vision for Structural Monitoring and Damage Detection  
 SS18(3): Computer Vision-based Structural Health Monitoring

Chairs: Hae Bum Yun; Yongchao Yang



- 3:50pm - 4:10pm** Absolute stress measurement in steel members using the Ler waves cross-correlation method  
J.B. He, Z.H. Li, J. Teng (Harbin Institute of Technology, China), Y. Wang (University of Surrey, UK)
- 4:10pm - 4:25pm** Arduino-based wireless sensor system to measure cable tension force  
S. Gil, J. Jo, S.H. Sim, S. Cho (University of Seoul, Korea)
- 4:25pm - 4:40pm** Diagnosis of interface debonding in composite structures using air-coupled impact resonance test  
Y. Zhou, M. Liu, W. J. Yi (Human University, China)
- 4:40pm - 4:55pm** Development of a high resolution optical inertial sensor  
B.L. Ding, J. Watchi, C. Collette (Université libre de Bruxelles, Belgium)
- 4:55pm - 5:10pm** Influence of axial force on propagation characteristics of AE signals in bridge cables  
C.J. Jiang, L.M. Sun, S. Jiao (Tongji University, China)
- 5:10pm - 5:25pm** Intelligent pavement condition assessment using piezo-floating-gate sensors  
H. Hasni, N. Lajnef, K. Chatti (Michigan State University, USA), K. Aono, S. Chakrabarty (Washington University, USA), F. Faridazar (Turner-Fairbank Highway Research Center, USA)
- Invited paper: On optimal distributed semi-active control of vibrating structures**  
D. Pisarski (Institute of Fundamental Technological Research of Polish Academy of Sciences, Poland)
- Invited paper: GIV-BMS-TMS-RMS Holistic Life-cycle Management for transportation structures and smart city: engineering data, inspection, maintenance, performance computing**  
M. Givon (GIV Solutions Ltd., Israel)
- Effects of cyclic and seismic loading on the superelastic behaviour of shape memory alloys**  
A. Kaup, O. Altay (RWTH Aachen University, Germany), J.T. Wang (Tsinghua University, China), S. Klinkel (RWTH Aachen University, Germany)
- Seismic response control based on response displacement for a bending-shear model**  
H. Kanno (Akita Prefectural University, Japan)
- Experimental investigations on the performance of a novel semi-active tuned liquid column damper**  
O. Altay, S. Stemmler, D. Abel, S. Klinkel (RWTH Aachen University, Germany)
- Development and experimental study of a self-centering variable damping energy dissipation brace**  
X.S. Xie, L.H. Xu (Beijing Jiaotong University, China), Z.X. Li (Tianjin University, China)
- Application of real-time hybrid simulation in performance evaluation of TLDs/TLCDs**  
J.T. Wang (Tsinghua University, China), F. Zhu (Changjiang Institute of Survey, Planning, Design and Research, China), L.Q. Lu (Tsinghua University, China), O. Altay (RWTH Aachen University, Germany), F. Jin (Tsinghua University, China)
- Load and parameter identification methods for nonlinear structures**  
L. Guo, Y. Ding, B. Wu (Harbin Institute of Technology, China)
- Structural identification of caisson breakwater via in-situ vibration measurement**  
S.Y. Lee, J.Y. Ryu, H.S. Yoon, J.T. Kim (Pukyong National University, Korea)
- Modal identification of arch dams from phase-based video processing**  
Q. Li, G.H. Wang (Wuhan University, China), Z. Mao (University of Massachusetts Lowell, USA), W.B. Lu (Wuhan University, China)
- Full-field imaging and modeling of structural dynamics from digital videos**  
Y.C. Yang, C. Farrar, D. Mascarenas (Los Alamos National Laboratory, USA)
- Invited paper: Deep learning implementations of pavement evaluation for large road networks using high-performance computing**  
S. Mokhtari, D. Behnke, H.B. Yun (University of Central Florida, USA)
- Detection of surface cracks**  
S.L. Zhou, W. Song (University of Alabama, USA)
- Concrete crack identification using computer vision in conjunction with machine learning**  
H.J. Kim, S.H. Sim (Ulsan National Institute of Science and Technology, Korea)
- Vision-based concrete crack detection**  
L.J. Wu, J.S. Ji, Z.C. Chen (Fuzhou University, China)
- Identify the multiple solutions in finite element model updating**  
S.Q. Qin, Y.Z. Zhang, J.Hu, J.T. Kang (Wuhan University of Technology, China)
- Some features found on bridge vertical deflection**  
Y.D. Tian, D.Y. Zhang, H. Li (Harbin Institute of Technology, China)
- Load and parameter identification methods for nonlinear structures**  
L. Guo, Y. Ding, B. Wu (Harbin Institute of Technology, China)
- Structural identification of caisson breakwater via in-situ vibration measurement**  
S.Y. Lee, J.Y. Ryu, H.S. Yoon, J.T. Kim (Pukyong National University, Korea)

- 5:25pm - 5:40pm** Towards health monitoring of road pavements with embedded strain sensors  
M. Barriera (EIFFAGE Infrastructures, France), B. Lebental (Université Paris-Est, France), C. Villette (Alliaroad, France), D. Zakharov (Université Paris-Saclay, France), F. Geisler (EIFFAGE Infrastructures, France), M. Buisson (Université Paris-Saclay, France) et al.
- 5:40pm - 5:55pm** Local-global damage identification approach using hybrid network of self-powered sensors  
H. Hasni, N. Lajnef (Michigan State University, USA), A.H. Alavi (University of Missouri, USA), K. Aono, S. Chakrabarty (Washington University, USA), F. Faridazar (Turner-Fairbank Highway Research Center, USA)
- 5:55pm - 6:10pm** Structural vibration control using inertial-based devices: a review of the state of the art  
M.A. Sadeghian, J. Yang (Shanghai Jiao Tong University, China)
- 5:55pm - 6:10pm** A multi-objective optimization with surrogate model for FE model updating in steel plate girder bridge  
Y.M. Hwang, S.S. Jin, H.Y. Jung, H.J. Jung (Korea Advanced Institute of Science and Technology, Korea)
- 5:55pm - 6:10pm** Research on structure damage identification method based on point cloud measurement and improved wavelet denoising function  
X. Chu, Z.X. Zhou, G.J. Deng, S. Shao, Y.K. Lei (Chongqing Jiaotong University, China)
- 5:55pm - 6:10pm** One year vibration and temperature monitoring on a steel plate girder bridge  
X. Ma, Y. Gao, C.W. Kim (Kyoto University, Japan)
- 5:55pm - 6:10pm** Identification of abnormal change of isolated structure based on long-term monitoring data  
Y.F. Du, Q.X. Zhu, W.Z. Zheng, W.R. Li, Q.K. Zhu (Lanzhou University of Technology, China)
- 5:55pm - 6:10pm** The mechanical response of magnetorheological dampers over time: an experimental modal analysis using smartphones  
E. Ozer (Middle East Technical University Northern Cyprus Campus, Turkey), D. Feng (Thornton Tomasetti Inc., USA), M.Q. Feng (Columbia University, USA)
- 5:55pm - 6:10pm** Inter-floor relative displacement measurement using ubiquitous surveillance camera  
L.J. Wu, Y.H. Zhang, L.X. Lin, Q.X. Huang (Fuzhou University, China)

## Concurrent Sessions 2 (Shangri-La Hotel)

**Session 2.13 - Room: Function Room 37**

**SS25: Practical Estimation of Structural Displacement and Its Applications**

**Chairs:** Tomonori Nagayama; Sung-Han Sim

**Session 2.14 - Room: Function Room 34**

**SS33(1): Strain-Based Structural Health Monitoring: New Developments and Applications**

**Chairs:** Jian Li; Hao Wang

**Session 2.15 - Room: Chairman Room**

**SS22(2): Uncertainty-Involved Structural Model Updating, Damage Assessment and Reliability Evaluation**

**Chairs:** Ying Lei; Gang Liu

**Session 2.16 - Room: Function Room 35**

**SS23(2): Vehicle-Bridge Interaction and Its Applications in Bridge-Weigh-in-Motion (BWIM), Damage Detection, and Bridge Management**

**Chairs:** Xuan Kong; Wei Zhang

- 3:50pm - 4:10pm** **Invited paper: Displacement reconstruction of beam structures from temporal or spatial second derivatives of displacement**  
K.Y. Park, H.S. Lee (Seoul Nat'l Univ., Korea)
- 4:10pm - 4:25pm** **Camera movement compensation for computer vision-based displacement measurement**  
J. Lee (Ulsan National Institute of Science and Technology, Korea), K.C. Lee (Korea Railroad Research Institute, Korea), S.H. Sim (Ulsan National Institute of Science and Technology, Korea)
- 4:25pm - 4:40pm** **Field implementation of image process based real-time bridge displacement monitoring using smart devices**  
A. Shrestha, J. Dang, K. Nakajima (Saitama University, Japan), X. Wang (Tohoku University, Japan)
- 4:40pm - 4:55pm** **Estimation of a continuous girder bridge's deflection using acceleration and inclination measurement**  
T. Nagayama, C. Zhang, D. Su, S. Lee (The University of Tokyo, Japan)
- 4:55pm - 5:10pm** **Transverse bridge displacement measurement using a laser carried by unmanned aerial system**  
E. Morelli, P. Garg, A. Ozdagli (University of New Mexico, USA)
- Invited paper: Sensing fatigue damage in steel bridges using strain-based skin sensor improved approximate bayesian computation**  
J. Li, X.X. Kong, C. Bennett, W. Collins (University of Kansas, USA), H. Jo, J.H. Jeong (University of Arizona, USA), S. Laflamme (Iowa State University, USA)
- Probabilistic damage identification using improved approximate bayesian computation**  
S.E. Fang, S. Chen (Fuzhou University, China)
- Long-term reliability assessment of OBR based DOFS on reinforced concrete elements**  
A. Barrias, J. R. Casas, S. Villalba (Technical University of Catalonia, Spain)
- Dynamic monitoring and model updating of the Leaning Tower of Pisa**  
G. Fiorentino, D. Lavorato (Roma Tre University, Italy), G. Quaranta (Sapienza University of Rome, Italy), B. Briseghella (Fuzhou University, China), C. Nuti (Roma Tre University, Italy; Fuzhou University, China)
- Stochastic analysis for train/track/bridge system with the randomness of bridge parameters and track irregularities**  
L.F. Xin, X.Z. Li, M. Wang (Southwest Jiaotong University, China)
- Wind tunnel measurement on side force coefficient of trains passing each other on truss bridge**  
X.W. Qiu, X.Z. Li, X.Y. Mao, H.Q. Sha (Southwest Jiaotong University, China)
- Strain-based structural operational modal analysis**  
D.H. Tang, W.H. Hu (Harbin Institute of Technology, China), S. Thöns (Technical University of Denmark, Denmark), J. Teng (Harbin Institute of Technology, China)
- Temperature effect compensation of bridge deflections using probabilistic graphical modeling**  
Y. Qin, Z. Mao (University of Massachusetts Lowell, USA)
- Nonlinear model updating method for damage diagnosis of UHPSFRC column after earthquakes**  
L.X. He, C.Q. Wu (University of Technology Sydney, Australia)
- Dynamic-strain-based damage evaluation of field-welded beam-to-column connections in steel frames**  
M. Kurata (Kyoto University, Japan), X. Li (Chongqing University, China), T. Matarazzo (Massachusetts Institute of Technology, USA)
- Identification of the moving train loads on the railway bridge based on monitoring strain data**  
Q.X. Zhu, H. Wang, J.X. Mao, Y.Q. Gao (Southeast University, China), S.T. Hu, X.X. Zhao (China Academy of Railway Sciences, China)
- Invited paper: Vehicle-bridge interaction and its applications in bridge monitoring, damage detection and bridge management**  
C.S. Cai, Y. Yu (Louisiana State University, USA), L. Deng (Hunan University, China), X. Kong (Colorado Department of Transportation, USA)
- Stochastic analysis for train/track/bridge system with the randomness of bridge parameters and track irregularities**  
L.F. Xin, X.Z. Li, M. Wang (Southwest Jiaotong University, China)
- A modified hybrid finite element and boundary element method for rail transit bridge-borne noise analysis**  
L.Z. Song, X.Z. Li, Y.K. Luo, Z. Guo, X. Zhang (Southwest Jiaotong University, China)
- Implement of BWIM system without axle detector**  
L. Deng, W. He (Hunan University, China)

**5:10pm - 5:25pm** Literature review on structural health monitoring for road pavements  
M. Manosalvas-Paredes, D. Lo Presti (University of Nottingham, UK)

The circumferential strain behavior of concrete cylinder in a freezing-thawing environment  
X.L. Kong (Suzhou Nuclear Power Research Institute, China), H.F. Lv (Dalian University of Technology, China), K.X. Liao (Suzhou Nuclear Power Research Institute, China), X.F. Zhao (Dalian University of Technology, China)

Structural damage identification using a multi-modes fusion method  
X.M. Lei, L.M. Sun, Y. Xia (Tongji University, China)

Driving safety analysis of various types of vehicles on long-span bridges in cross winds considering aerodynamic interference  
Y. Han (Changsha University of Science & Technology, China), C.S. Cai (Louisiana State University, China)

**5:25pm - 5:40pm** Control of surface subsidence based on the data of building deformation monitoring  
V. Yepin (Institute of Continuous Media Mechanics of the Ural Branch of the RAS, Russia), A. Barayakh (Perm Federal Research Center of the Ural Branch of the RAS, Russia), I. Shardakov, A. Shestakov, R. Tsvetkov (ICMMUB of RAS, Russia)

Structure Damage identification under ambient excitation with mutative-scale symbolic time series analysis  
D.S. Li, Q.Z. Li, S. Meng, H.N. Li (Dalian University of Technology, China)

## Concurrent Sessions 2 (Shangri-La Hotel)

**Session 2.17 - Room: Function Room 26**

**SS31(1): Application of Structural Health Monitoring Techniques**

Chairs: Shunlong Li; Michael Todd

**3:50pm - 4:10pm** Invited Paper: Meta-model based on virtual distortion method and its application to obtain the baseline finite element model of bridges  
Y. Liu, C.X. Yang, Z.C. Tan (Harbin Institute of Technology, China)

**Session 2.18 - Room: Function Room 36**

**SS30: Understanding, Mitigating, and Utilizing Human Induced Structural Responses**

Chairs: Hae Young Noh; Pei Zhang

**3:50pm - 4:10pm** The effects of hammer operator in manually operated impact hammer testing of lightweight structures  
X.J. Wei, J. Russell, S. Živanović, J.T. Mottram (University of Warwick, UK)

**4:10pm - 4:25pm** Nanocomposite fabric sensors for socket prostheses and pressure ulcer prevention  
L. Wang, K.J. Loh (University of California-San Diego, USA)

- 4:25pm - 4:40pm** **Damage detection in bolt connection using wireless impedance sensor**  
 T.C. Huynh, N.L. Dang, C.U. Nguyen, J.T. Kim (Pukyong National University, Korea)
- 4:40pm - 4:55pm** **Research on axle identification based on strain time travel curve of bridge**  
 T.Z. Hao (Guangxi Transportation Research & Consulting Co. Ltd.)
- 4:55pm - 5:10pm** **Research on structural health monitoring system of Hubei Shishou Yangtze River Bridge**  
 Y. Jin (CCCC Highway Consultants Co. Ltd., China), M.Z. Zhang, S.F. Tang (Hubei Shishou Yangtze River Highway Bridge Construction Headquarters, China), X.L. Li, X.F. Sun (CCCC Highway Consultants Co. Ltd., China)
- 5:10pm - 5:25pm** **Study on vehicle load and bridge response of the Anqing Bridge based on monitoring data**  
 Y.C. Xu, Y.F. Zhang (The State Key Laboratory on Safety and Health of In-service Long-span Bridges, China; Jiangsu Transportation Institute Co. Ltd., China)
- 5:25pm - 5:40pm** **Structural characteristic evolution of long-span suspension bridge: a case study**  
 F.J. Zhang, W.C. Xu, Z.L. Ye, Z.Q. Liu, N. Li (CCCC Highway Consultants Co. Ltd., China), H. Li (Harbin Institute of Technology, China)
- 5:40pm - 5:55pm** **Data driven approaches of abnormal vibration analysis and early warning for stay cables**  
 L. Xiao (Ningbo Hangzhou Bay Bridge Development Co. Ltd., China), Y. Jin (CCCC Highway Consultants Co. Ltd., China), J.Q. Wang (Ningbo Hangzhou Bay Bridge Development Co. Ltd., China), W.C. Xu, S.Y. He (CCCC Highway Consultants Co. Ltd., China)
- Human shaker for dynamic test of civil structures**  
 Z.P. Hang, J. Chen (Tongji University, China)
- Collaborative sensor grouping for indoor human sensing through structural characterization**  
 S.J. Pan, M. Mirshekari, J. Fagert, P. Zhang, H.Y. Noh (Carnegie Mellon University, USA)
- First peak control concept for active control of human-induced vibration and impact noise of building floors**  
 A. Igarashi (Kyoto University, Japan), K. Shiomi (IHI Corporation, Japan), T. Kachi (Sumitomo Riko Co. Ltd., Japan)
- Vibration control of footbridges due to human activities**  
 C.C. Lin, J. Dorcena, G.L. Lin (National Chung Hsing University, Taiwan, China)
- Dynamic properties of traditional wooden frames filled with cavity walls**  
 J. Zhang, T. Aoki (Nagoya City University, Japan), S. Hu, Y.H. Li, C. Gao (Southeast University, China)

**5:55pm - 6:10pm** Research on structure health monitoring of urban bridge group  
W.C. Xu, Z.L. Ye, Y. Jin, F.J. Zhang, Y.Y. Cui (CCCC Highway Consultants Co. Ltd., China)

### Banquet

**Chair:** Billie F. Spencer, Jr, **Location:** Grand Ballroom, 1st Floor, Shangri-La Hotel  
**(1). Report - Practice of Structural Health Monitoring of Long-span Bridges in China**  
Na Li, CEO of Division of Big Data, CCCC Highway Consultants CO., Ltd  
**(2). Kobori Prize Ceremony**

**6:30pm - 9:00pm**

## July 24 (Tuesday)

### Registration Opens

**Registration Desk:** Foyer of China Hall, 2nd Floor, Shangri-La Hotel

**8:00am - 7:00pm**

**Keynote Sessions 3 (Chairs: T.T. Song & Andrew Smyth, Location: China Hall, Shangri-La Hotel)**

**8:30am - 9:00am**

**Keynote 6 - AI Support Urban Planning and the Urban Future**  
Professor Zhiqiang Wu, Tongji University, China

**9:00am - 9:30am**

**Keynote 7 - Topology Optimization for Stochastically-excited Structures with Supplemental Dampers**  
Professor Billie F. Spencer, Jr, University of Illinois at Urbana-Champaign, USA

**9:30am - 10:00am**

**Keynote 8 - The Value Case for Structural Monitoring of Bridges - Necessity or Indulgence?**  
Professor Campbell R. Middleton, Cambridge University, UK

**10:00am - 10:30am**

Coffee break

**Keynote Sessions 4 (Chairs: Fabio Casciati & Limin Sun, Location: China Hall, Shangri-La Hotel)**

**10:30am - 11:00am**

**Keynote 9 - Development of Eddy Current Damping Technology for Structural Vibration Control**  
Professor Zhenqing Chen, Hunan University, China

**Keynote 10 - Recent Rresearch on Passive Control of Offshore Structural Vibrations in the Centre for Infrastructure Monitoring and Protection (CIMP) at Curtin University**

Professor Hong Hao, Curtin University, Australia

11:00am - 11:30am

**Keynote 11 - Sparse Structural System Identification of Linear and Nonlinear Systems**

Professor Satish Nagarajaiah, Rice University, USA

11:30am - 12:00pm

12:00pm - 1:00pm

**Lunch**

**Location:** Grand Ballroom, 1st Floor, Shangri-La Hotel

**Concurrent Sessions 3 (Shangri-La Hotel)**

**Session 3.1 - Room: Function Room 22**

**Session 3.3 - Room: China Hall 2**

**Session 3.4 - Room: Function Room 31**

SS03(3): Application, Research and Design on Structural Control in Japan

SS04(3): New Development of Smart Devices for Structural Control

SS10: Recent Advances in Hybrid Simulation and Real Time Hybrid Simulation

**Chairs:** Haruhiko Kurino; Masashi Yamamoto

**Chairs:** Songye Zhu; Jian Li

**Chairs:** Yuanfeng Duan; Tao Wang

**Invited paper:** Update of control parameters of semi-actively controlled base-isolated building

**Invited paper:** Using electromagnetic shunt dampers to emulate various mechanical dampers

**Invited paper:** Real-time hybrid simulation for tuned mass damper using discrete-time compensation technique

M. Kohiyama, M. Omura, M. Takahashi (Keio University, Japan), O. Yoshida, K. Nakatsuka (Obayashi Corp., Japan)

J. Y. Li, S. Y. Zhu (The Hong Kong Polytechnic University, China)

W. Song, S. Hayati (University of Alabama, USA)

**1:50pm - 2:05pm** Confirmation of vibration characteristics and prediction of safety limit condition with using observed data

**Research progress on structure health monitoring in China: review of the development of health monitoring of the highway bridges in Shandong Province**

**Theoretical study and experimental validation on the energy dissipation mechanism of particle dampers**

**Real time hybrid simulation based on vector form intrinsic finite element and field programmable gate array**

M. Ogawa, K. Kusunoki (The University of Tokyo, Japan), Y. Sako, M. Yamazoe (Kobori Research Complex Inc, Japan)

X. B. Zhang (Qilu Transportation Development Group Co. Ltd., China)

Z. Li, B. Huang (Tongji University, China), S.F. Masri (University of Southern California, USA), Y. Zhou (Tongji University, China)

J.J. Tao, Y.F. Duan, Y. Fang, (Zhejiang University, China) H.M. Zhang (Tongji University, China), C.B. Yun (Zhejiang University, China)

- 2:05pm - 2:20pm** Neural oscillator network extracting dominant frequency from earthquake-induced acceleration responses of structures  
H. Tokumura, D. Iba (Kyoto Institute of Technology, Japan), J. Hongu (Tohoku University, Japan), I. Moriwaki (Kyoto Institute of Technology, Japan)
- 2:20pm - 2:35pm** Active mass damper using neural oscillator for generating a limit cycle of target structure  
J. Honhu (Tohoku University, Japan), D. Iba (Kyoto Institute of Technology, Japan)
- 2:35pm - 2:50pm** Development of spatio-temporal filter adjustment technique used in phase-compensated velocity feedback to active control of floor vibration under impact excitation  
K. Xue, A. Igarashi (Kyoto University, Japan), T. Kachi (Sumitomo Riko Co. Ltd., Japan)
- 2:50pm - 3:05pm** Design of concentrated seismic control building by soft-first-story system using FRTVMDs  
K. Miyazaki, K. Murakami (Nikken Sekkei Ltd., Japan)
- 3:05pm - 3:20pm** Study on a new type of composite tuned liquid damper  
C.P. Zhu, J.Y. Zhang (Nagoya City University, Japan)
- 3:20pm - 3:35pm** The outline and monitoring results of seismic isolation retrofit of the Kanagawa prefectural office  
K. Bae, T. Tomizawa, J. Kawabata (Kozo Keikaku Engineering, Japan)
- Bridge displacement monitoring based on smartphones**  
N.N. Wang, Z. Zou, H. Liu, X.F. Zhao (Dalian University of Technology, China)
- Structural monitoring system for a Polar Class icebreaker**  
R.Q. Ma, H.L. Ren, Z.P. Li, G.Q. Feng, Y.Z. Wang (Harbin Engineering University, China)
- Structural durability monitoring of a newly built high-piled wharf in a harbor with anode ladder sensor**  
H.B. Liu, Q. Zhang, X.P. Liu (Tianjin Research Institute for Water Transport Engineering, China)
- A strain monitoring method of surrounding rock based on FBG sensor**  
S.Li, C. Li (Shenyang Jianzhu University, China)
- A systematic method from influence line identification to damage detection of bridge structures**  
Z.W. Chen, M.Q. Liu, W.B. Yang (Xiamen University, China)
- Damper performance under winds: a real-time hybrid simulation-based evaluation**  
W. Song (The University of Alabama, USA), T. Wu (University of Buffalo, USA)
- Study on a nonlinear mass damper for displacement reduction of a base-isolated structure to seismic excitations**  
J. Wang, Z. Liu, H. Li, F. Liu (Hunan University of Technology, China)
- Tuned Viscous Mass Damper (TVMD) coupled wall system used for high-rise buildings**  
X.D. Ji, J.S. Zhang (Tsinghua University, China), K. Ikago (Tohoku University, Japan)
- Study on stability analysis method based on mode diagrams for real-time hybrid simulation**  
H.M. Zhou, T. Wang, M.N. Li (Institute of Engineering Mechanics, China Earthquake Administration, China)
- Experimental study on deformation recoverability of Fe-based SMA reinforced concrete beam-column joints**  
S. Yan, Z.F. Xiao, M.Y. Lin, Y. Li (Shenyang Jianzhu University, China)
- Real-time hybrid simulator for evaluating interactions with non-linear system model by using shaking table**  
S. Uchida, Y. Mukai, Y. Miki, H. Fujitani, M. Ito (Kobe University, Japan)
- Application of a negative stiffness device in the benchmark problem for a base isolated building**  
T. Sun (Shenyang Jianzhu University, China), Z.L. Lai, S. Nagarajah (Rice University, USA), H.N. Li (Shenyang Jianzhu University, China)
- Sensitivity-based constitutive parameter identification of nonlinear structures with unknown input earthquake excitation**  
S. Weng, Z.D. Chen, R.L. Li, J.J. Li, H.P. Zhu (Huazhong University of Science and Technology, China)
- Robustness analysis of performance-based plastic design method for CBFs equipped with SMA braces**  
C.X. Qiu, X.N. Zhao, Y.C. Zhang (Shandong University, China)
- An experimental study of buckling-restrained steel plate shear walls with inclined slots**  
S.S. Jin (Chongqing Jiaotong University, China), J.L. Bai (Chongqing University, China), J.P. Ou (Harbin Institute of Technology, China)



3:35pm - 3:50pm

Coffee break

## Concurrent Sessions 3 (Shangri-La Hotel)

Session 3.5 - Room: Function Room 32

SS06(1): Seismic Isolation in Civil Engineering

Chairs: Ping Tan; Mineo Takayama

**1:30pm - 1:50pm** Invited paper: Recent progress and application of seismic isolation in the mainland of China  
P. Tan (Guangzhou University, China)

Session 3.6 - Room: Function Room 27

SS08(1): Flow Controls for Wind and Structural Engineering

Chairs: Wenli Chen; Feng Xu

Invited paper: Theoretical framework of flutter suppression for long-span suspension bridges by the feedback control twin-winglet system  
L. Zhao, K. Li, Y. J. Ge (Tongji University, China)

Session 3.7 - Room: Function Room 25

SS26(1): Monitoring-based Performance Assessment of Infrastructure

Chairs: Jiazeng Shan; Eleni Chatzi

Invited paper: A comparison of three different methods for the identification of hysterically degrading structures using BWN model  
Y. Zhao (Southeast University, China), M. Noori (Southeast University, China), California Polytechnic State University, USA), W.A. Altabay (Southeast University, China, Alexandria University, Egypt)

Session 3.8 - Room: China Hall 3

SS18(1): Computer Vision-based Structural Health Monitoring

Chairs: Xiaowei Ye; Bao-Hua Shan

Invited paper: Image processing software specifications  
S. Casciati (University of Catania, Italy), L. Faravelli, F. Casciati (University of Pavia, Italy)

**1:50pm - 2:05pm** Observed response of seismically isolated buildings during the 2016 Kumamoto earthquake  
M. Takayama, K. Morita (Fukuoka University, Japan)

Study on non-stationary wind-induced effect of super-large cooling tower based on field measurements  
H. Wang, S.T. Ke (Nanjing University of Aeronautics and Astronautics, China)

Instability monitoring of space grid structures under blizzards  
Y.G. Fu, F. Gómez, B.F. Spencer Jr. (University of Illinois at Urbana-Champaign, USA)

Applications of vision-based systems for bridge deformation measurement  
Y. Xu, J. Brownjohn (University of Exeter, UK), F. Huseynov (Full Scale Dynamics Ltd., UK)

**2:05pm - 2:20pm** Shake table tests for a bridge model with elastomeric pad bearings and steel dampers  
J.Z. Li, W.J. Xu (Tongji University, China), H. Tang (Shanghai Municipal Engineering Design Institute, China), N.L. Xiang (Tongji University, China)

Parameters design and performance analysis of parallel-connected viscous mass damper for vibration control of stay cables  
C. Yang, Z.W. Huang, X.G. Hua, Z.Q. Chen (Hunan University, China)

Automated cable monitoring system using smart sensors under the varying tension force condition  
S. Jeong, H. Kim, J. Lee, S.H. Sim (Ulsan National Institute of Science and Technology, Korea)

Utilization of shape functions for strain measurements using computer vision methods and FE model comparison  
C.Z. Dong, O. Celik, F.N. Catbas (University of Central Florida, USA)

- 2:20pm - 2:35pm** **Hysteretic modelling of steel wire mesh reinforced elastomeric isolation bearing**  
H. Fei (Tongji University, China), Z. Sun (State Key Laboratory on Disaster Reduction in Civil Engineering, China)
- 2:35pm - 2:50pm** **Seismic effect analysis of low-frequency acceleration pulse imposed on the half-through arch bridge**  
F. Xing (Southwest Jiaotong University, China), X.F. Li (Jiangxi Tongji Engineering Design Co. Ltd., China)
- 2:50pm - 3:05pm** **A variable stiffness hydraulic three-dimensional isolation for single-layer reticulated domes**  
Z.T. Chen, Y.D. Shi, Y. Ding (Tianjin University, China)
- 3:05pm - 3:20pm** **Investigation on a vertical isolation system with quasi-zero stiffness property**  
Y. Zhou, P. Chen (Tongji University, China), G. Mosqueda (University of California, San Diego, USA)
- 3:20pm - 3:35pm** **Modelling and experimental study of a semi-active base isolator employing magnetorheological elastomer**  
X.Y. Gu, B. Samali (Western Sydney University, Australia), Y. Yu, J.C. Li, Y.C. Li (University of Technology, Australia), M. Askari (Western Sydney University, Australia)
- 3:35pm - 3:50pm** **Numerical simulations and experimental validations on aerodynamic effect of wind barriers on train-bridge system**  
L. Zhou, X.H. He, Haiquan Jing (National Engineering Laboratory for High Speed Railway Construction; Central South University; Joint International Research Laboratory of Key Technology for Rail Traffic Safety, China)
- 3:50pm - 4:05pm** **Control of flow past a circular cylinder by using active jets**  
D.L. Gao, W.L. Chen, G.B. Chen, H. Li (Harbin Institute of Technology, China)
- 4:05pm - 4:20pm** **Experimental investigation of flows around a circular cylinder controlled by steady suction**  
C.R. Zheng (Harbin Institute of Technology, China), C.C. Liu (China Overseas Property Group Co. Ltd, China), M. Khan, W.L. Chen (Harbin Institute of Technology, China)
- 4:20pm - 4:35pm** **Control of wind-induced vibration of a solar tower by tuned mass damper**  
M. Liu, S.Y. Li (Hunan University, China), H.X. Li (Northwest Electric Power Design Institute Co. Ltd, China), Z.Q. Cheng (Hunan University, China)
- 4:35pm - 4:50pm** **Wake control of a bridge model based on periodic-wake-instability at low Reynolds number**  
H.F. Zhang, D.B. Xin (Northeast Forestry University, China), Ou J.P. (Harbin Institute of Technology, China)
- 4:50pm - 5:05pm** **Monitoring-based identification and modeling of soil-structure interaction using shaking table testing**  
N. Gong, K.R. Ruan, C.J. Zhang, P.Z. Li (Tongji University, China)
- 5:05pm - 5:20pm** **Deep learning based semantic segmentation for cracking damage detection**  
Y. Wang, J.Y. Fu, J.S. Yang, Z.H. Zhu (Central South University, China)
- 5:20pm - 5:35pm** **Automated bridge component recognition using video data**  
Y. Narazaki, V. Hoskere, T. A. Hoang, B. F. Spencer (University of Illinois at Urbana-Champaign, USA)
- 5:35pm - 5:50pm** **Observability and identification of damage-healing hysteretic model**  
X. Shi, M.N. Chatzis (University of Oxford, UK), S.P. Triantafyllou (University of Nottingham, UK), M.S. Williams (University of Oxford, UK)
- 5:50pm - 6:05pm** **SHM-aided seismic performance evaluation for high-rise buildings**  
R.P. Hu, Y.L. Xu (The Hong Kong Polytechnic University, China)
- 6:05pm - 6:20pm** **Post-earthquake seismic capacity estimation using displacement and acceleration measurement**  
T. Y. Hsu (National Taiwan University of Science and Technology, Taiwan, China), S. Y. Hsiao (National Center for Research on Earthquake Engineering, Taiwan, China)
- 6:20pm - 6:35pm** **Data-driven damage tracking and evaluation of earthquake-excited nonlinear structures**  
H.Q. Zhang, B.Z. Cai, Y.T. Ouyang, J.Z. Shan (Tongji University, China)
- 6:35pm - 6:50pm** **Extracting damage indicator features from videos via phase-based motion estimation and video magnification**  
A. Sarrafi, Z. Mao (University of Massachusetts Lowell, USA)
- 6:50pm - 7:05pm** **Computer vision-based structural displacement measurement using an Unmanned Aerial System (UAS)**  
H. Yoon (Michigan Technological University, USA), J. Shin, B. Spencer (University of Illinois at Urbana-Champaign, USA)
- 7:05pm - 7:20pm** **Impact characteristics computation for simply-supported viscoelastically-connected double-beam under moving harmonic loads**  
Y.C. Wang, Z. Sun (Tongji University, China)

## Coffee break

**3:35pm - 3:50pm**

### Concurrent Sessions 3 (Shangri-La Hotel)

Session 3.9 - Room: Function Room 33

SS35(1): Innovative Developments in Structural System Identification

Chairs: Satish Nagarajah, Ying Lei

**1:30pm - 1:50pm** Invited paper: Identification of nonlinear oscillators with multiple analytical mode decompositions

H. Ou, T. Li, G.D. Chen (Missouri University of Science and Technology, USA)

**1:50pm - 2:05pm** An entropy-based structural health monitoring system for multi-bay three-dimensional structures

T.K. Lin, A.G. Lainez, Y.H. Chien (National Chiao Tung University, Taiwan, China)

**2:05pm - 2:20pm** Structural damage detection based on crack damage function and equivalent damage factor vector

Z.P. Chen, L. Yu (Jinan University, China)

**2:20pm - 2:35pm** Identification of time-varying structural parameters with partial measurements by synthesis of wavelet multiresolution analysis and Kalman filter

S. Chen, Y. Lei (Xiamen University, China)

Session 3.10 - Room: Function Room 34

SS33(2): Strain-Based Structural Health Monitoring: New Developments and Applications

Chairs: Jian Li; Hao Wang

Invited paper: Analysis of structural strain responses of a long-span cable-stayed bridge using SHM data

H. Wang, J.X. Mao (Southeast University, China), J. Li (University of Kansas, USA), Q.X. Zhu, Y.Q. Gao (Southeast University, China)

Assessment of bridge condition based on strain data under vehicle loads

Z. Sun (Jiangsu Transportation Institute, China)

BOTDA based full length strain monitoring of an offshore wind turbine monopile

J.L. Xu, Y.K. Dong, H. Li (Harbin Institute of Technology, China)

Stress statistic analysis and fatigue life estimating of short suspender on operating arch bridge

J.Y. Lei, Q.S. Xiao, Z.H. Wang, W. Shi (Xiamen University, China)

Session 3.11 - Room: Chairman Room

SS29(1): Innovative Technologies for System Integration, SHM Application, and Structural Performance Assessment

Chairs: Ying Xu; Zhenhua Nie

Invited paper: Structural multi-scale model updating based on the Kriging approximate surrogate model and NSGA-II

W. Lu, Y. Cui (Harbin Institute of Technology, China), J. Teng (Harbin Institute of Technology, China; Fujian University of Technology, China)

Vibration-based structural damage detection by deep learning method on a small steel bridge structure

Y.Q. Zhang, Y. Miyamori, S. Mikami, T. Saito (Kitami Institute of Technology, Japan)

Structural damage detection of simple beam subjected to a moving load using Deep Learning

Y.X. Wang (Jinan University, China), Z.H. Nie (Dongguan University of Technology, China), H.W. Ma (Qinghai University, China), X.R. Ma

Bridge structural damage detection by phase space method using two sensor measured responses

Z.H. Nie, H.M. Pang (Jinan University, China), H.W. Ma (Jinan University, China; Dongguan University of Technology, China)

Session 3.12 - Room: Function Room 35

SS23(3): Vehicle-Bridge Interaction and Its Applications in Bridge-Weigh-in-Motion (BWIM), Damage Detection, and Bridge Management

Chairs: Steve C.S. Cai; Xuan Kong

Bridge scour detection using dynamic responses of vehicles and structures

X. Kong (Hunan University, China), C.S. Cai, J.X. Hu (Louisiana State University, USA)

Vibration suppression of a highway bridge-traffic coupled system using multiple pounding tuned mass dampers

X.F. Yin (Changsha University of Science & Technology, China), G. Song (University of Houston, USA), Y. Liu (Changsha University of Science & Technology, China)

Development of solid vehicle-bridge interaction analysis system based on model updating

W.S. Han, Q. Xie (Chang'an University, China)

Fatigue design based on AASHTO Code and vehicle-bridge vibration

W. Wang, L. Deng (Hunan University, China)

<b>2:35pm - 2:50pm</b>	An UKF-UI for the identification of nonlinear structural systems and unknown input <u>X. Y. Li, D.D. Xia, Y. Lei</u> (Xiamen University, China)	Dynamic performance of a long-span triple-tower suspension bridge subjected to vessel collision <u>R.J. Liang, H. Wang, T.Y. Tao</u> (Southeast University, China)	Vibration based structural damage detection with residual network <u>Y.Z. Liu</u> (Jinan University, China), <u>H.W. Ma</u> (Dongguan University of Technology, China)	Dynamic performance of concrete girder bridges strengthened with external prestressing tendons under moving vehicles <u>Y. Li, Z. Li, T.T. Yang, K.Y. Lu</u> (Harbin Institute of Technology, China)
<b>2:50pm - 3:05pm</b>	An importance sampling method for reliability analysis based on optimal Latin hypercube sampling <u>W. Zhao, P. Liu, H.M. Zou</u> (Jinan University, China)	Analysis of the influence of solar temperature difference on the strain of a super high-rise building during construction <u>F. Gao, P. Chen, S. Weng, H.P. Zhu</u> (Huazhong University of Science and Technology, China)	Damage evaluation for RC buildings using seismic response data <u>H.R. Pan, K. Kusunoki</u> (The University of Tokyo, Japan), <u>Y. Hattori</u> (Shimizu Corporation, Japan)	
<b>3:05pm - 3:20pm</b>	Monitoring-based probabilistic modeling of wind properties: model selection and parameter inference <u>L. Yuan, X.W. Ye, P.S. Xi</u> (Zhejiang University, China)	Stress monitoring of large span space structure during construction <u>L. Ren, H.N. Li, T.H. Yi, J.J. Wang</u> (Dalian University of Technology, China)	Damage simulation of cable of long-span concrete cable-stayed bridge <u>Z.W. Zhou, B. Wen, L.Y. Huang, L. Zhao, C.F. Wan</u> (Southeast University, China)	
<b>3:20pm - 3:35pm</b>	Sensitivity-free damage identification of tall buildings by incomplete modal data and sparse regularization <u>L. Wang, Z.R. Lu</u> (Sun Yat-sen University, China)	VCS-based substructure identification for shear structure <u>D.Y. Zhang</u> (Harbin Institute of Technology, China)	Damage detection at web/ flange junction of welded I-section steel beam based on impact-optic technique <u>Y. Xu, L. Niu, M. Xie</u> (Harbin Institute of Technology, China)	

**3:35pm - 3:50pm** **Coffee break**

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**Concurrent Sessions 3 (Shangri-La Hotel)**

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**Session 3.13 - Room: Function Room 26** **Session 3.14 - Room: Function Room 36** **Session 3.15 - Room: Function Room 37**

<b>SS31(2): Application of Structural Health Monitoring Techniques</b>	<b>SS00(1): Passive and TMD Control of Structures</b>	<b>SS39(1): Bridge Structural Automatic Monitoring and Intelligent Construction of High-speed Railway</b>
Chairs: Shunchen Song; Yufeng Zhang	Chairs: Ying Zhou; Xugang Hua	Chairs: Wei Su; Xinxin Zhao

- 1:30pm - 1:50pm** **Invited Paper: Research on the Fast Condition Assessment Method of Bridge Based on the Simple Monitoring System**  
Y.F. Zhang, Y.C. Xu (JSTI, China)
- 1:50pm - 2:05pm** **An effective use of measurements under main shock of earthquake to predict structural dynamic properties under aftershocks**  
Y. Ikeda (Kyoto University, Japan)
- 2:05pm - 2:20pm** **Wave method for structural health monitoring: variation of vertical wave velocities in 16 buildings as a function of structural type and building material**  
M. Rahmani (California State University, USA), M.I. Todorovska (Tianjin University, China; University of Southern California, USA), J.R. Grabinski (California State University, USA)
- 2:20pm - 2:35pm** **Dispersion curve estimation via laser ultrasound-generated variance map**  
S.Y. Chong, M. Todd (University of California, San Diego, USA)
- 2:35pm - 2:50pm** **A novel method for crack monitoring of concrete structures**  
X.X. Li, B.N. Zhang, C. Tu, Y.Y. Zhao, W. Tang (Chongqing Jiaotong University, China)
- 2:50pm - 3:05pm** **Examination of the temperature dependency of natural frequencies of buildings using long-term ambient noise**  
X. Wang, T. Hatakeyama, M. Motosaka, S. Ohno (Tohoku University, Japan)
- Comparison of optimal damper distributions in shear frames in terms of soil conditions**  
E. Aydin, O. Sivrikaya (Nigde Omer Halisdemir University, Turkey), B. Ozturk (Hacettepe University, Turkey)
- Seismic control of a 3-stories frame by a single-side pounding tuned mass damper (SS-PTMD)**  
W.X. Wang, X.Y. Wang, X.G. Hua (Hunan University, China), G.B. Song (University of Houston, USA), Q. Wen, Z.Q. Chen (Hunan University, China)
- Optimum design of multiple tuned mass dampers for vibration control of asymmetric buildings**  
C.C. Lin, G.L. Lin, J.Y. Jian (National Chung Hsing University, Taiwan, China)
- Preliminary research on TMD parameters for swing vibration control of suspended structures**  
C.W. Zhang, H. Wang, D.S. Liu (Qingdao University of Technology, China)
- Semi-active tuned mass damper with phase control for structural vibration mitigation**  
L.L. Chung (National Center for Research on Earthquake Engineering, Taiwan, China), Y.A. Lai (National Taiwan University, Taiwan, China), C.S.W. Yang (Institute of Georgia Technology, USA)
- A practical displacement-based design method for viscoelastic dampers attached to high-rise structures**  
S.M. Gong, Y. Zhou (Tongji University, China)
- Invited paper: Intelligent settlement monitoring system of high-speed railway bridge**  
Y. Zhuo, J.S. Gu, X. Wang (China Railway Design Corporation, China)
- Research on key technologies of PHM system for railway bridges**  
Y.J. Pan (Railway Engineering Research Institute, China)
- Analysis of existed railway bridge foundation deformation influenced by foundation pit excavation**  
F. Wang (China Railway Design Corporation, China)
- Application of BIM technology in the bridge of Beijing to Shenyang passenger dedicated line**  
S.F. Song, S.M. Liu, S.P. Zhang (China Railway Design Corporation, China)
- A simplified calculation for effects of adjacent ground load on vertical displacement of pile foundation**  
F.Z. Meng, Y. Zhuo (China Railway Design Corporation, China)
- Application and consideration of BIM technology in railway bridges**  
W. Su (China Railway Design Corporation, China)

**3:05pm - 3:20pm** Stress field monitoring of multi-strand tendon anchorage using impedance response via PZT interface  
 N.L. Dang, T.C. Huynh, W.B. Na, J.T. Kim (Pukyong National University, Korea)

Design of viscous dampers based on minimization of first floor interstorey drift monitoring system for long trunk high speed railway  
 B. Ozturk, H. Cetin (Nigde Omer Halisdemir University, Turkey), E. Aydin (Hacettepe University, Turkey)

Research of automatic settlement monitoring system for long trunk high speed railway  
 X. Wang (China Railway Design Corporation, China)

**3:20pm - 3:35pm** Multi-scale structural damage identification based on generalized extended Kalman filter under unknown inputs (GEKF-UI) and substructure approach  
 J.S. Huang, J.J. Zhu, N. Yang, Y. Lei (Xiamen University, China)

Autonomous modal identification of Xiangtan railway bridge based on structural health monitoring  
 H. Wang, J.X. Mao, Q.X. Zhu (Southeast University, China), S.T. Hu, X.X. Zhao (China Academy of Railway Sciences, China)

**3:35pm - 3:50pm**

Coffee break

### Concurrent Sessions 4 (Shangri-La Hotel)

**Session 4.1 - Room: Function Room 22**  
 SS06(3): Seismic Isolation in Civil Engineering  
 SS03(4): Application, Research and Design on Structural Control in Japan

**Session 4.2 - Room: Function Room 24**  
 SS04(4): New Development of Smart Devices for Structural Control

**Session 4.3 - Room: China Hall 2**  
 SS04(5): New Development of Smart Devices for Structural Control

**Session 4.4 - Room: Function Room 31**  
 SS11: Development and Applications of Hybrid Testing Methods

**3:50pm - 4:10pm** A study of mechanical and thermal interaction behavior of lead rubber bearing  
 M. Yukawa (Obayashi Corporation, Japan), T. Furuhashi (Nihon University, Japan), S. Inaba, Y. Takeuchi, K. En (Obayashi Corporation, Japan)

Chairs: Ping Tan; Takeshi Furuhashi  
 Invited paper: Modelling the hysteretic behaviour of a fluid inerter for use as a parallel-viscous-inerter-damper device  
 P. Deastra, D.J. Wagg, N.D. Sims (University of Sheffield, UK)

Chairs: Jianchun Li; Jian Li  
 Invited paper: Design of hybrid multi-actuation schemes for vibration control of adjacent twin structures  
 B. Wu (Wuhan University of Technology, China) X.Z. Ning, G.S. Xu, Z. Wang, Z. Mei (Harbin Institute of Technology, China), G. Yang (Wuhan University of Technology, China)

Chairs: Xuejun Yin; Songye Zhu  
 Invited paper: Online numerical simulation for hybrid testing with incomplete boundary conditions  
 B. Wu (Wuhan University of Technology, China) X.Z. Ning, G.S. Xu, Z. Wang, Z. Mei (Harbin Institute of Technology, China), G. Yang (Wuhan University of Technology, China)

Chairs: Tao Wang; Bin Wu

- 4:10pm - 4:25pm** Analytical and experimental study of sloped sliding-type bearings  
 C.Y. Yang (National Center for Research on Earthquake Engineering, Taiwan, China), C.K. Lin (National Taiwan University, Taiwan, China), S.J. Wang (National Taiwan University of Science and Technology, Taiwan, China) et al.
- 4:25pm - 4:40pm** The sliding pendulum isolators for the Padma Bridge  
 M. Agostino (Wuhan Hiron Engineering Equipment Co. Ltd., China)
- 4:40pm - 4:55pm** A new design response spectrum for isolated structure and synchronous design method  
 W.G. Liu, Y.X. Feng, Q. Zhang (Shanghai University, China), D.M. Feng (Fujita Corp., Japan),
- 4:55pm - 5:10pm** Analysis of amplified vertical accelerations of slabs in a base-isolated RC moment frame  
 T.H. Yu, E.A. Johnson (University of Southern California, USA)
- 5:10pm - 5:25pm** A smart isolator based on magnetorheological elastomer  
 Q. Wang, X.F. Dong, L.Y. Li, J.P. Ou (Dalian University of Technology, China)
- Investigation on story shear ratio resisted by BRBs for RC-BRBF structures**  
 J.L. Bai (Chongqing University, China), S.S. Jin (Chongqing Jiaotong University, China), F. Cheng (Chongqing University, China), J.P. Ou (Harbin Institute of Technology, China)
- Multi-mode control performance of inertial mass damper in stay cable vibration**  
 Z.W. Huang, X.G. Hua, Z.Q. Chen, H.W. Niu (Hunan University, China)
- Jump estimators for lossy wireless structural control**  
 T.H.T. Truong, P. Seiler, L.E. Linderman (University of Minnesota, USA)
- Experimental behavior and analysis of pre-pressed spring self-centering energy dissipation braces**  
 L.H. Xu, X.W. Fan (Beijing Jiaotong University, China), Z.X. Li (Tianjin University, China)
- An adaptive SMART shear key and its mechanical properties for earthquake/tsunami mitigation**  
 X.Z. Yuan, G.D. Chen (Missouri University of Science and Technology, USA)
- Prevention of stroke saturation of inertial actuators used for active vibration control of floor structures**  
 M.W. Ahmadi, W.K. Ao, P. Reynolds (University of Exeter, UK)
- Semi-active isolation of an existing Italian highway bridge using seismic early warning information**  
 I. Nuzzo, N. Caterino (University of Naples Parthenope, Italy), G. Maddaloni (University of Sannio at Benevento, Italy), A. Occhiuzzi (University of Naples Parthenope, Italy)
- Force-displacement hybrid control of experiments on engineering structures with multi-degree-of-freedom**  
 H.M. Zhou, S. Zhu, M. Li, T. Wang (Institute of Engineering Mechanics, CEA, China)
- Element oriented hybrid simulation for frame structures**  
 Y.S. Chen (Institute of Engineering Mechanics, CEA, China), B. Wu (Wuhan University of Technology, China), L.X. Zhang (Institute of Engineering Mechanics, CEA, China)
- H $\infty$  optimization of tuned inerter damper with negative stiffness device subjected to support excitation**  
 K. Ye, Y.X. Zhang, W.N. Shen, R. Fu (Huazhong University of Science and Technology, China)
- Development of self-centering dampers incorporating shape memory alloy ring springs**  
 C. Fang, W. Wang, A. Zhang (Tongji University, China)
- Optimal tuned inerter damper for base-excited structures**  
 W.A. Shen, A. Niyitangamahoro, H.P. Zhu (Huazhong University of Science and Technology, China)
- A loading control method based on control points for structural quasi-static and pseudo-dynamic tests**  
 G. Yang, B. Wu (Wuhan University of Technology, China), Z. Wang, G.S. Xu (Harbin Institute of Technology, China)
- Effect of nonlinear substructure behavior on uncertainty quantification for hybrid simulation**  
 C. Chen, Y.F. Xu (San Francisco State University, USA)
- Real-time hybrid tests of structures with a tuned mass damper using shaking table**  
 M. Ito, H. Fujitani, Y. Mukai, M. Okano, K. Nishikawa (Kobe University, Japan), G. Mosqueda (University of California, San Diego, USA)

**5:25pm – 5:40pm** Active fuzzy control of seismic model structure  
W.J. Zhang, X.F. Liu (Beijing University of Technology, China)

**5:40pm – 5:55pm** Design example of high-rise seismic isolation building of applying the pseudo-mode control  
H. Kuriisu, T. Haijima, H. Kobayashi (Azusa Sekkei Co. Ltd., Japan), T. Furuhashi (Nihon Univ., Japan)

**5:55pm – 6:10pm**

**Test model and loading control method for bi-directional hybrid simulation of a full-scale two-story RC frame with BRBs**  
Q. Y. Tan, P.F. Shi (Harbin Institute of Technology, China), B. Wu (Wuhan University of Technology, China), Z. Wang, J.Y. Sun (Harbin Institute of Technology, China)

**Shape memory alloy wire as crossfies for cable vibration mitigation: effects of temperature**  
H.J. Zhou, X. Yang, X.B. Zhou (Shenzhen University, China), L.M. Sun (Tongji University, China), F. Xing (Shenzhen University, China)

**Assessment of post-earthquake permanent displacement of structures**  
J.H. Huang, S.Y. Zhu (Hong Kong Polytechnic University, China)

**Magnetic properties of reinforcement and corrosion products described by an upgraded monitoring apparatus**  
Z.Li, Z.Q. Jin, X.B. Xu, S.S. Shao (Qingdao University of Technology, China)

**Electromagnetic inertial mass damper for vibration control of cable with sag**  
Z.H. Wang, H. Gao, Y.W. Xu (North China University of Water Resources and Electric Power, China), Z.Q. Chen (Hunan University, China)

## Concurrent Sessions 4 (Shangri-La Hotel)

**Session 4.5 - Room: Function Room 32**

**SS06(2): Seismic Isolation in Civil Engineering**

**Chairs:** Demin Feng, Ying Zhou

**Invited paper: The State of art in seismic isolation and energy dissipation applications in Japan**  
D.M. Feng (Fujita Corp. Japan)

**Session 4.6 - Room: Function Room 27**

**SS08(2): Flow Controls for Wind and Structural Engineering**

**Chairs:** Wenli Chen; Feng Xu

**Invited paper: Control of wind-induced effects of a bridge deck based on passive vortex generators**  
D.B. Xin, H.F. Zhang (Northeast Forestry University, China), J.P. Ou (Harbin Institute of Technology, China)

**Session 4.7 - Room: Function Room 25**

**SS26(2): Monitoring-based Performance Assessment of Infrastructure**

**Chairs:** Jiazeng Shan; Eleni Chatzi

**Invited paper: Wind turbine tower structural heal monitoring and vibration control**  
K.S. Dai, Z. Zhao, Y. Wang, Z.B. Ding, Y.F. Shi, J.Y. Zhao (Tongji University, China)

**Session 4.8 - Room: China Hall 3**

**SS18(2): Computer Vision-based Structural Health Monitoring**

**Chairs:** Xiaowei Ye; Bao-Hua Shan

**Invited paper: Long-term SHM data and meta-data management using informational modeling and virtual reality environments**  
A. Blyth, R. Napolitano, B. Glisic (Princeton University, USA)



- 4:10pm - 4:25pm** Numerical study of the response of a base isolated structure using low-cost devices  
A. Calabrese (California State University Long Beach, USA), M. Spizzuoco, S. Strano, M. Terzo (University of Naples Federico II, Italy)
- 4:25pm - 4:40pm** Analytical and experimental investigations of seismically isolated building using distributed parameter model  
P. Tan (Guangzhou University, China), X. Song (Henan University, China)
- 4:40pm - 4:55pm** Towards broadband seismic isolation systems  
C. Collette, B.L. Ding, G.Y. Zhao, J. Watchi (Université libre de Bruxelles, Belgium)
- 4:55pm - 5:10pm** Study of seismic improvement for girder bridge by poly-urethane-modified polymer bearings  
S.Q. Wang, Y. Yuan, X.C. Feng, H.P. Zhu (Huazhong University of Science and Technology, China)
- 5:10pm - 5:25pm** Optimization, structural deterministic and probabilistic safety analyses of a 3D innovative seismic base isolation system  
V. Kostarev, P. Vasilyev, P. Vasilyev, M. Vaindrakh (CKTI-Vibroseism, Russia)
- 4:10pm - 4:25pm** Aerodynamic characteristics of a high-speed train travel on the bridge  
S.M. Zou, X.H. He, H.Q. Jing, H.F. Wang, Y.F. Zou (Central South University, China)
- 4:25pm - 4:40pm** A comparative study on the wake characteristics of wind turbines sited in atmospheric boundary layer winds with different turbulence levels  
W. Tian (Shanghai Jiao Tong University, China; Iowa State University, USA), H. Hu (Iowa State University, USA)
- 4:40pm - 4:55pm** Feedback control of flutter oscillation of a suspension bridge sectional model by twin-winglet system  
H.L. Chen, K.Li, L. Zhao, Y.J. Ge (Tongji University, China)
- 4:55pm - 5:10pm** On damage localization in wind turbine blades: a critical comparison and assessment of modal-based criteria  
K. Tatsis, V. Derfmanis, E. Chatzi (Institute of Structural Engineering, Switzerland)
- 5:10pm - 5:25pm** Deep learning-based surface crack detection of bridge structures  
T. Jin, X.W. Ye, P. Y. Chen (Zhejiang University, China)
- 5:25pm - 5:40pm** Deep learning models for seismic reliability assessment of buildings  
H. Sun, Z. Chen (University of Pittsburgh, USA)
- 5:40pm - 5:55pm** Energy harvesting from vertical pedestrian-induced vibrations of footbridges  
C. Demartino (Nanjing Tech University, China), C. Maruccio (University of Salerno, Italy), G. Quaranta (Sapienza University of Rome, Italy)
- 5:55pm - 6:10pm** Evaluation of structural integrity using vibrational image measurements  
C.M. Chang, C.C. Yang, J.Y. Chou (National Taiwan University, Taiwan, China)
- 6:10pm - 6:25pm** Reconstruction of 3D images for underwater foundations of bridges based on sonar data  
J.B. Luo, S.F. Jiang, S. Seng, Y.M. Zeng, C.Q. Lai (Fuzhou University, China)
- 6:25pm - 6:40pm** Thickness measurement of water film/rivulets based on grayscale index  
H.Q. Jing, X.H. He (Central South University; National Engineering Laboratory for High Speed Railway Construction, China), X. Zhou (Central South University, China)
- 6:40pm - 6:55pm** Stereovision measurement of 3D displacement of a five-storey RC frame model in a shaking table test  
B.H. Shan, D.G. Lu, X.H. Yu, Z.L. Xue, H. Wang, Y.M. Qiao (Harbin Institute of Technology, China)
- 6:55pm - 7:10pm** Integration of structural control and the identification of structures under unknown excitation  
J.B. Lu, H. Qiu, Y. Lei (Xiamen University, China)
- 7:10pm - 7:25pm** Jet separation delay for an inclined jet-in-ramp  
W.W. Zhou, Y.Z. Liu, D. Peng, X. Wen, W.Z. Wang (Shanghai Jiao Tong University, China), H. Hu (Iowa State University, USA)
- 7:25pm - 7:40pm** Study on flow control for suppressing oscillating wake of a square cylinder by traveling wave wall  
F. Xu, L.Q. Zhang, Y.Q. Xiao, Z.D. Duan, J.P. Ou (Harbin Institute of Technology, China)
- 7:40pm - 7:55pm** 6-DOF displacement field measurement using RGB color and depth information  
S. Lee, J. Lee, S.H. Sim, (Ulsan National Institute of Science and Technology, Korea), J.W. Park (Chung-Ang University, Korea), S.H. Sim (Ulsan National Institute of Science and Technology, Korea)

- 5:25pm - 5:40pm** Study on shaking table test on seismic simulation of isolated high speed railway bridge  
D. Wu, (Guangzhou University, China), X.Q. Zhang (China Academy of Railway Sciences, China)  
Zhang (China Academy of Railway Sciences, China)  
Li, J.H. Wang, Y.Q. Xiao (Harbin Institute of Technology, Shenzhen, China)
- 5:40pm - 5:55pm** Applications of SRIM fluid viscous dampers in Japan  
D.M.Feng Y. Sasaki (Fujita Corp. Japan),  
W.F. Zhu (Shanghai Research Institute of Materials, China)
- 5:55pm - 6:10pm** Dynamic behavior of high-damping rubber bearings under non-proportional plane loading  
S.J. Wang, W.C. Lin (National Center for Research on Earthquake Engineering, Taiwan, China), J.S. Hwang (National Taiwan University of Science and Technology, Taiwan, China)
- Computational modelling the equilibrium atmospheric boundary layer using optimal body force terms within the near-ground zone**  
Y.B. Peng, S.F. Wang (Tongji University, China)  
K. Xiao (Electric Power Research Institute of Guangdong Power Grid Co., Ltd, China),  
Li, J.H. Wang, Y.Q. Xiao (Harbin Institute of Technology, Shenzhen, China)
- Coupled wake flutter causes vortex induced vibrations of a flexible cable**  
D.L. Gao, W.L. Chen, W.H. Yang, Y.W. Huang, H. Li (Harbin Institute of Technology, China)
- Efficient evaluation of value of information for geotechnical preposterior analysis with BUS**  
F.P. Zhang, Z.J. Cao, D.Q. Li (Wuhan University, China)
- Damage detection technology and pipeline test site of urban water supply pipeline**  
Q.F. Hu, B.W. Zhou, E. Wang, C.L. Ning, T. Sun (Tongji University, China)
- Damage localization and quantification of a simply supported beam using quasi-static moving load test**  
W.Y. He, FC. Meng (Hefei University of Technology, China), S. Zhu (The Hong Kong Polytechnic University, China)
- Recent developments in wind turbine structural health monitoring in Northwest of China**  
W.R. Li, X.T. Luan, J.F. Zhang, Y.F. Dong, J. Wei (Lanzhou University of Technology, China)

### Concurrent Sessions 4 (Shangri-La Hotel)

- Session 4.9 - Room: Function Room 33** SS35(2): Innovative Developments in Structural System Identification  
 Chairs: Ling Yu; Jian Zhang
- Session 4.10 - Room: Function Room 34** SS37: Recent Development and Future Trend for Research and Application of Structural Control in China  
 Chairs: Junxian Zhao; Yi Pan
- Session 4.11 - Room: Chairman Room** SS29(2): Innovative Technologies for System Integration, SHM Application, and Structural Performance Assessment  
 Chairs: Chengyin Liu; Wei Zhang
- Session 4.12 - Room: Function Room 35** SS38: Structural Health Monitoring of Long-span Bridges  
 Chairs: Xiaolin Meng; John Owen

**3:50pm - 4:10pm** Invited paper: Vision-based rapid impact testing and identification of footbridge  
Y.D. Tian, J.Zhang (Southeast University, China)

Invited paper: Seismic performance of steel buckling-restrained braced frames with novel sliding gusset connections  
J.X. Zhao, R.B. Chen, Z. Wang (South China University of Technology, China), W. Han (Beijing Brace Damping Engineering Technology Co. Ltd., China)

Invited paper: Free vibration of two cables interconnected by a damper  
H.J. Zhou, X.B. Zhou, G.Z. Yao (Shenzhen University, China), L.M. Sun (Tongji University, China), F. Xing (Shenzhen University, China)

Invited paper: Long-term monitoring and data analysis of GNSS vertical deformation time series of the fourth road bridge tower  
Q.S. Chen (Wuhan University, China; the University of Nottingham, UK), B.X. Ju (Wuhan University, China), X. Meng (the University of Nottingham, UK), W.P. Jiang (Wuhan University, China)

**4:10pm - 4:25pm** Online estimation of dynamic displacements by multi-rate data fusion based on Kalman filter with unknown input  
H. Qiu, Z.C. Wang, N. Yang, Y. Lei (Xiamen University, China)

Viscous inertial mass dampers in the coupled tall buildings for the seismic responses control  
L. Lu, Y. Zhou, X.L. Lu (Tongji University, China), B.F. Spencer, Jr (University of Illinois at Urbana-Champaign, USA), J.Q. Xu (Tongji University, China)

Bottlenecks and breakthroughs of health monitoring  
C. Lu (JSTI Group, China)

Insights from long-term seismic monitoring of a long-span suspension bridge  
D. Siringoringo, Y. Fujino (Yokohama National University, Japan)

**4:25pm - 4:40pm** Parameter identification of a shear-type building based on seismic response with unknown ground motion  
J.P. Yang, L.M. Sun, Y. Xia (State Key Lab of Disaster Reduction of Civil Engineering, Tongji University, China)

Direct design method for damped structure based on seismic capacity margin. I: Methodology  
M.M. Islam (Tongji University, China), L.F. Hao (Guangzhou University, China), R.F. Zhang, S.T. Xue (Tongji University, China)

The effects of SHM system and algorithm characteristics on the value of damage detection information  
L.J. Long, S. Thöns (BAM Federal Institute for Materials Research and Testing, Germany; Technical University of Denmark, Denmark), M. Döhler (BAM Federal Institute for Materials Research and Testing, Germany, France)

GNSS and earth observation for structural health monitoring of long-span bridges – GeoSHM A case study of the Forth Road Bridge  
D.T. Nguyen, X. Meng, J.S. Owen, Y. Xie, P. Psimoulis (University of Nottingham, UK), G. Ye (UbiPOS UK Ltd, UK), B. Valentine, P. Madden (Forth Bridge Unit, Amey Consulting, Edinburgh, UK)

**4:40pm - 4:55pm** Identifying nonlinear characteristics of model-free MR dampers in structures with partial response data  
X.J. Yang, H. Su, L.J. Liu (Xiamen University, China)

Direct design method for damped structure based on seismic capacity margin. II: Application  
W. Liu, L.F. Hao (Guangzhou University, China), P. Tan, R.F. Zhang (Tongji University, China)

Fatigue performance of existing coastal slender bridges under multiple stochastic dynamic loads  
J. Zhu, W. Zhang (University of Connecticut, USA)

Modal frequency analysis of a highway-railway cable-stayed bridge based on high frequency GPS data  
H. Liu, X.J. Dai (China Railway Major Bridge (Nanjing) Bridge and Tunnel Inspect & Retrofit Co. Ltd., China), Q.Z. Zhang, J. Qian (China University of Mining and Technology, China) et al.

- 4:55pm - 5:10pm** Convolutional neural networks based quantitative crack assessment  
 F.T. Ni (Southeast University, China), Z.Q. Chen (University of Missouri-Kansas City, USA), J. Zhang (Southeast University, China)
- 5:10pm - 5:25pm** Moving force identification by using discrete wavelet basis and L1-norm regularization  
 H.L. Liu, L. Yu (Jinan University, China)
- 5:25pm - 5:40pm** Identification of the nonlinear restoring force of model-free structure with partial response data  
 L.J. Liu, H. Su (Xiamen University, China)
- 5:40pm - 5:55pm** Experimental verification of general extended Kalman filter with unknown inputs  
 X.Z. Li, Y. Lei (Xiamen University, China)
- 5:55pm - 6:10pm** Buckling-restrained braces with replaceable fuses: an experimental investigation  
 W. Wang, X. Liu, H. Hou, B. Qu (Shandong University, China)
- Simulation and verification of human fall load**  
 Z.S. Jiang (San Francisco State University, USA), C.Y. Liu, X.X. Su ( Harbin Institute of Technology, China)
- Study on adaptive alarm for health monitoring of heavy haul**  
 H. Cheng, J.W. Zhong (Key Laboratory of Bridge Structure Safety and Health of Hubei Province, China), L.X. Feng (ShenHua Zhungeer Energy Company Ltd., China)
- Building damage and retrofit effectiveness evaluation of a SRC building using vertical array measurements of ambient noises**  
 X. Wang (Tohoku University, Japan), K. Irikura, K. Masaki (Aichi Institute of Technology, Japan)
- Design and Implementation of the New System for Long Bridge Monitoring-from GeoSHM to iSHM**  
 Y. Xie, X. Meng, D.T. Nguyen, J.S. Owen, P. Pismoulis (University of Nottingham, UK), G. Ye (UbiPOS UK Limited, Nottingham, UK), L. Wu (China Railway Bridge (Nanjing) Bridge and Tunnel Inspect & Retrofit Co., Ltd, Nanjing, China) et al.
- Bridge damage detection based on the analysis of deflection influence line**  
 C.Y. Liu, Z. Peng (Harbin Institute of Technology Shenzhen Graduate School, China)
- Monitoring and control of movements in modular expansion joints of long-span bridge**  
 T. Guo, L.Y. Huang, J. Liu (Southeast University, China)
- A folding analysis method of the origami structure for the construction control**  
 T.H. Zhang, M.E. Wu (Tongji University, China), K. Kawaguchi (University of Tokyo, China), K. Kawaguchi (University of Tokyo, China), K. Kawaguchi (University of Tokyo, China), O.E. Ozbulut (University of Virginia, USA), W.Y. Huang (Guangzhou University, China)
- Seismic collapse assessment of steel moment resisting frame with failure considered SMA-based damper**  
 F. Shi, Y. Zhou (Guangzhou University, China), O.E. Ozbulut (University of Virginia, USA), W.Y. Huang (Guangzhou University, China)
- Behaviour of buckling-restrained brace with gapped tendon protections**  
 C.L. Wang, Y. Qing, S.P. Meng (Southeast University, China)
- Seismic collapse assessment of steel moment resisting frame with failure considered SMA-based damper**  
 F. Shi, Y. Zhou (Guangzhou University, China), O.E. Ozbulut (University of Virginia, USA), W.Y. Huang (Guangzhou University, China)
- Study on damage identification of cable slip between layers based on derivatives of eigen-parameters**  
 J.T. Zhong, Q.S. Yan (South China University of Technology, China)

## Concurrent Sessions 4 (Shangri-La Hotel)

Session 4.13 - Room: Function Room 26    Session 4.14 - Room: Function Room 36    Session 4.15 - Room: Function Room 37

**SS31(3): Application of Structural Health Monitoring Techniques**

Chairs: Tianzhi Hao; Yao Jin

**3:50pm – 4:10pm** Invited paper: Real-time geometric parameter identification of moving ships in bridge area using novel computer vision techniques  
Y.P. Guo, S.L. Li, Y. Xu, Z.L. Li, H. Li (Harbin Institute of Technology, China)

**SS00(2): Self-centering Structures**

Chairs: Tong Guo, Chenxi Mao

Invited paper: Development and application of Self-centering concrete structures with friction devices.  
T. Guo, L. L. Song, Z. K. Xu, Y. W. Hao (Southeast University, China)

**SS39(2): Bridge Structural Automatic Monitoring and Intelligent Construction of High-speed Railway**  
**SS31(4): Application of Structural Health Monitoring Techniques**

Chairs: Yi Zhuo; Wei Su

Perspectives for studying deformation processes in large-scale reinforced concrete structures on a special test stand  
I. Shardakov, A. Shestakov, G. Gusev, R. Tsvetkov, V. Yepin, I. Glot (Institute of Continuous Media Mechanics of the Ural Branch of the RAS, Russia)

**4:10pm – 4:25pm** Application of intelligent sensors in cloud network system of structural health monitoring

W.J. Yang (Kingmach Measurement & Monitoring Technology Co. Ltd., China)

The stochastic equivalent linearization of the stationary random process for self-centering systems using a developed flag-shape model

H.M. Zhang, L.M. Quan, X.L. Lu (Tongji University, China)

**4:25pm – 4:40pm** Analysis of the influence of cable force test precision on cable-stayed bridge

L.L. Wang (Guangxi Transportation Research & Consulting Co. Ltd., China)

Research on the elongation measurement and control technology for prestressed automatic tensioning of railway precast beams

H. Di, Y. Zhuo (China Railway Design Corporation, China)

**4:40pm – 4:55pm** Structural health self-monitoring for controlled buildings with active mass dampers

C.C. Chang (National Applied Research Laboratories, Taiwan, China), J.F. Wang (National United University, Taiwan, China), C.C. Lin (National Chung Hsing University, Taiwan, China)

Seismic performance of horizontally assembled self-centering bridge pier under ground motions

P. Zhang, S.C. Li, A.X. Guo, H. Li (Harbin Institute of Technology, China)

Analysis of influence of adjacent railway bridge pier surcharge on settlement of high-speed

J.S. Gu (China Railway Design Corporation, China)

- 4:55pm - 5:10pm** Fatigue performance study for high strength steel wire in cable-stayed bridge using AE monitoring technology  
C.S. Wang, H.P. Si, L. Duan, B. Yao, C. Liu (Chang'an University, China)
- 4:55pm - 5:10pm** Seismic performance of self-centering reinforced concrete frame structures under rare and super-rare earthquakes  
Z.Y. Wang (Harbin Institute of Technology, China), C.X. Mao (Institute of Engineering Mechanics, CAE, China), L.L. Xie, H. Li (Harbin Institute of Technology, China)
- 4:55pm - 5:10pm** Design and construction of railway prestressed concrete continuous segmental bridges  
W. Su, Y.W. Zhou (China Railway Design Corporation, China)
- 5:10pm - 5:25pm** Long-term monitoring and analysis for lateral crawling of curved box-girder bridge  
K. Cheng (Henan Transportation Research Institute Co. Ltd., China), G.B. Tang (Research and Development Center on Bridge Safety Detection & Reinforcement Technology, China) et al.
- 5:10pm - 5:25pm** Seismic collapse capacity evaluation of self-centering concrete frame structure  
Z.Y. Wang (Harbin Institute of Technology, China), C.X. Mao (Institute of Engineering Mechanics, China Earthquake Mechanics, China Earthquake Administration, China), L.L. Xie (Harbin Institute of Technology, China)
- 5:25pm - 5:40pm** On study for damage detection of non-engineered masonry structures micro-tremor measurement of damaged buildings by the 2015 Gorkha Earthquake in Nepal  
M. Takeuchi, H. Hoshino, Y. Mukai (Kobe University, Japan), N. Yamamoto (Nara Women's University, Japan), M. Masui (Kyoto University, Japan) et al.
- 5:25pm - 5:40pm** Swing story-lateral force resisting frame system connected with dampers  
W. Li, P. Xiang, L.J. Jia, M.E. Wu (Tongji University, China)
- 5:40pm - 5:55pm** Investigation of frequency accuracy influence on stay cable tension identification  
T.Z. Hao (Guangxi Transportation Research & Consulting Co. LTD)
- 5:55pm - 6:10pm** BIM modeling tool development for main structure of concrete continuous girder based on CAA  
C.L. Qi (China Railway Design Corporation, China)
- 5:40pm - 5:55pm** Study on the safety threshold of bridge additional deformation in high-speed railways based on dynamic mapping relationship and train-bridge dynamic interaction  
H.Y. Gou, Q.H. Pu (Southwest Jiaotong University, China)
- 5:55pm - 6:10pm** Failure Mechanism and Performance Design of High Speed Railway Bridge  
W. Guo, Z.W. Yu, L.Z. Jiang (Central South University, China)
- 6:30pm - 9:00pm** BBQ  
Location: Garden of the Surf Plaza Resort Hotel  
Boarding: Shuttle bus, Parking Lot of Shangri-La Hotel at the left of Shangri-La Hotel Entrance , 6:30pm

## July 25 (Wednesday)

8:00am - 12:30pm	<p><b>Registration Opens</b>  <b>Registration Desk:</b> Foyer of China Hall, 2nd Floor, Shangri-La Hotel</p>
	<p><b>Keynote Sessions 5 (Chairs: Shirley Dyke &amp; Yiqing Ni, Location: China Hall, Shangri-La Hotel)</b></p>
8:30am - 9:00am	<p><b>Keynote 12 - Application of HHT in Structure Health Monitoring</b>            Professor Norden E. Huang, the First Institute of Oceanography &amp; Qingdao National Marine Science and Technology, China</p>
9:00am - 9:30am	<p><b>Keynote 13 - Nonlinear dynamics-inspired control</b>            Professor Walter Lacarbonara, Sapienza University of Rome, Italy</p>
9:30am - 10:00am	<p><b>Keynote 14 - Control of Human-induced Vibrations: an Integrated Approach to Vibration Serviceability Design</b>            Professor Paul Reynolds, University of Exeter, UK</p>
10:00am - 10:30am	<p><b>Coffee break</b></p>
	<p><b>Keynote Sessions 6 (Chairs: Chung-Bang Yun &amp; Toru Watanabe, Location: China Hall, Shangri-La Hotel)</b></p>
10:30am - 11:00am	<p><b>Keynote 15 - Synthesis of Life-cycle Management and Health Monitoring for Long-span Bridges</b>            Professor Youlin Xu, the Hong Kong Polytechnic University, Hong Kong, China</p>
11:00am - 11:30am	<p><b>Keynote 16 - Bridge Inspection and Condition Assessment Using Unmanned Aerial Vehicles and Deep Learning</b>            Professor Hyung-Jo Jung, Korea Advanced Institute of Science and Technology (KAIST), Korea</p>
11:30am - 12:00pm	<p><b>Conference Closed Ceremony</b>  <b>Chair:</b> Professor Sami F. Masri, IASCM Secretary General, <b>Location:</b> China Hall, Shangri-La Hotel</p>
12:00pm - 1:00pm	<p><b>Lunch</b>  <b>Location:</b> Grand Ballroom, 1st Floor, Shangri-La Hotel</p>
1:15pm-5:00pm	<p><b>Technical Visit</b>  <b>Route:</b> Shandong High-speed Jiaozhou Bay Bridge  <b>Boarding:</b> Shuttle bus, Parking Lot of Shangri-La Hotel at the left of Shangri-La Hotel Entrance, 1:15pm</p>