The Ninth Kwang-Hua Forum

Innovations and Implementations in Earthquake Engineering Research: Engineering Resilience

December 10-12, 2021

Shanghai, China

Hosted by

College of Civil Engineering, Tongji University

State Key Laboratory of Disaster Reduction in Civil Engineering

International Joint Research Laboratory of Earthquake Engineering

Earthquake Resiliency Committee, Seismological Society of China

Shanghai Engineering Research Center for Resilient Cities and Intelligent Disaster Mitigation

Sponsored by

State Key Laboratory of Disaster Reduction in Civil Engineering

International Joint Research Laboratory of Earthquake Engineering

Tongji University

Tongji Architectural Design (Group) Co., Ltd.

Shanghai Evolution Building Shift Engineering Co., Ltd.

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Contents

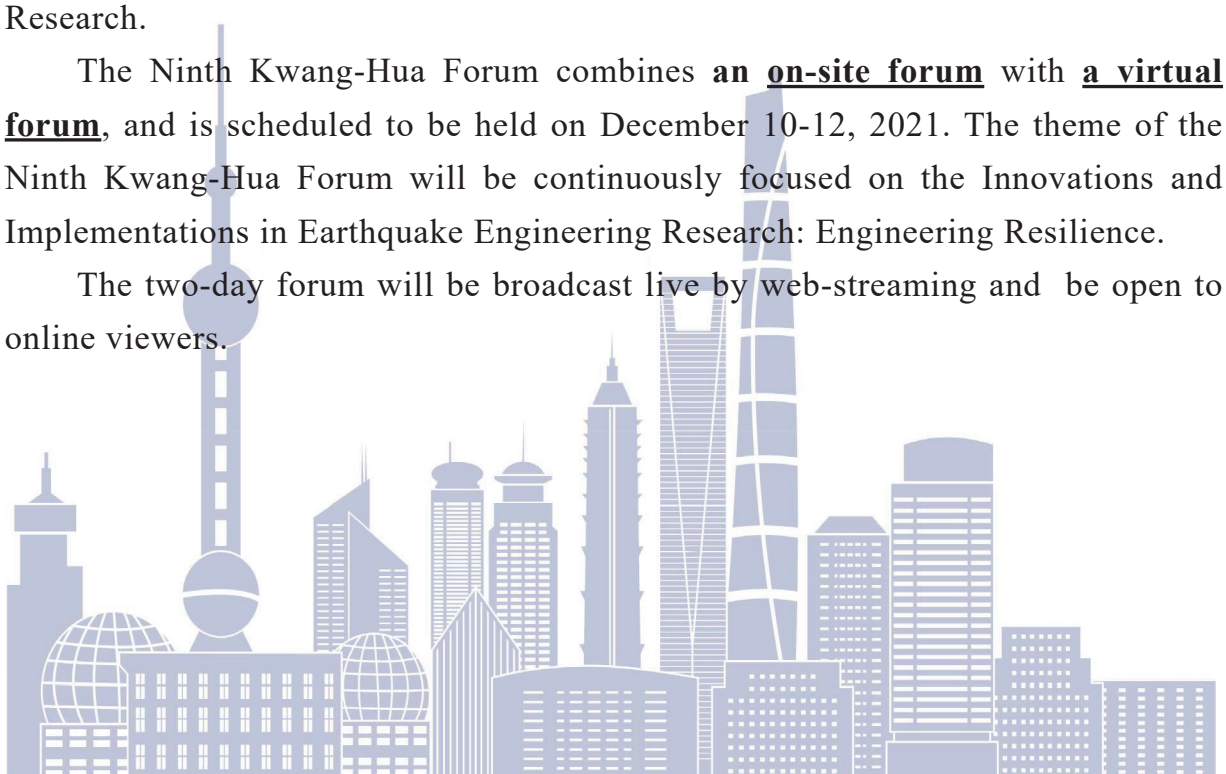
Introduction

Since 2008, eight Kwang-Hua Forums have been successfully held at Tongji University. The objective of the forum is to provide a platform for experts around the world to present and exchange recent progress and implementation of earthquake engineering research. The forum also aims to promote international collaboration on how to achieve practical implementation of earthquake engineering research through planning, design, construction and maintenance.

The themes of the forums have been carefully selected to match the state-of-the-art earthquake engineering research around the world. The first Kwang-Hua Forum was held in October 2008. The theme was focused on the 8-magnitude Wenchuan earthquake which hit southwest of China in May 2008. Detailed earthquake effect and post-earthquake reconstruction were discussed in this forum. The second Kwang-Hua Forum was held in October 2009, of which the theme was focused on Performance-based Design Theory and Code Development for Civil and Structural Engineering. In October 2010, the third Kwang-Hua Forum was held with the focus on Sustainable Civil Engineering. The fourth Kwang-Hua Forum was held in conjunction with the grand opening symposium of Tongji Multi-Functional Shaking Table Array in December 2011. The fifth, sixth, seventh and eighth Kwang-Hua Forums were held in December 2012, 2014, 2016 and 2018 with the focus on the Innovations and Implementations in Earthquake Engineering Research.

The Ninth Kwang-Hua Forum combines **an on-site forum** with **a virtual forum**, and is scheduled to be held on December 10-12, 2021. The theme of the Ninth Kwang-Hua Forum will be continuously focused on the Innovations and Implementations in Earthquake Engineering Research: Engineering Resilience.

The two-day forum will be broadcast live by web-streaming and be open to online viewers.



Invited Participants

Fulin Zhou

Member of the Chinese Academy of Engineering, Guangzhou University, China

Jinping Ou

Member of the Chinese Academy of Engineering, Harbin Institute of Technology, China

Xiuli Du

Member of the Chinese Academy of Engineering, Beijing University of Technology, China

Ian Buckle

Professor, University of Nevada Reno, USA

Junwu Dai

Professor, Institute of Engineering Mechanics, CEA, China

Rajesh Dhakal

Professor, University of Canterbury, New Zealand

Yoshiaki Goto

Professor, Nagoya Institute of Technology, Japan

Hong Hao

Professor, Curtin University, Australia

Kohju Ikago

Professor, Tohoku University, Japan

Kazuhiko Kasai

Professor, Tokyo Institute of Technology, Japan

Sashi K. Kunnath

Professor, University of California at Davis, USA

Guoqiang Li

Professor, Tongji University, China

Hongnan Li

Professor, Dalian University of Technology, China

Jianzhong Li

Professor, Tongji University, China

Paolo Negro

Professor, Joint Research Centre - European Commission, Italy

Camillo Nuti

Professor, University RomaTre, Italy

Kyriazis Pitilakis

Professor, Aristotle University, Greece

Yongjiu Shi

Professor, Tsinghua University, China

Junho Song

Professor, Seoul National University, Korea

Billie F. Spencer

Foreign Member of the Chinese Academy of Engineering, University of Illinois at Urbana-Champaign, USA

Fabio Taucer

Senior Expert, Joint Research Centre - European Commission, Italy

Tamon Ueda

Professor, Shenzhen University, China

Carlos Ventura

Professor, The University of British Columbia, Canada

Lanmin Wang

Lanzhou Institute of Seismology, CEA, China

Ying Zhou

Professor, Tongji University, China

Songye Zhu

Professor, Hong Kong Polytechnic University, China

Scientific Committee

Xilin Lu (China, Chair)
Billie F. Spencer (USA, Vice Chair)
Kazuhiko Kasai (Japan, Vice Chair)
Kyriazis Pitilakis (Greece,Vice Chair)

Ian Buckle (USA)
Oreste S. Bursi (Italy)
Dimitri E. Beskos (Greece)
Gian M. Calvi (Italy)
Wanlin Cao (China)
Kuo-Chun Chang (Chinese Taipei)
Houqun Chen (China)
Anil K. Chopra (USA)
Junzhi Cui (China)
Gregory G. Deierlein (USA)
Juan Carlos de la Llera (Chile)
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Kenneth Elwood (New Zealand)
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Boris Jeremic (USA)
Huanjun Jiang (China)
Toshimi Kabeyasawa (Japan)
Ahsan Kareem (USA)
Tetsuo Kubo (Japan)
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Khalid Mosalam (USA)
Masayoshi Nakashima (Japan)
Satish Nagarajaiah (USA)
Jinping Ou (China)
Peng Pan (China)
Alberto Pavese (Italy)
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Qingxuan Shi (China)
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Keh-Chyuan Tsai (Chinese Taipei)
Tamon Ueda (Japan/China)
Shigeki Unjoh (Japan)
John W. van de Lindt (USA)
Carlos Ventura (Canada)
Akira Wada (Japan)
Tao Wang (China)
Andrew S. Whittaker (USA)
Yan Xiao (USA/China)
Lili Xie (China)
Feng Xiong (China)
Youlin Xu (China)
Zhaodong Xu (China)
Weichen Xue (China)
Tony Yang (Canada)
Yeong-Bin Yang (China)
Jihong Ye (China)
Changhai Zhai (China)
Xigang Zhang (China)
Xin Zhang (China)
Fulin Zhou (China)
Ying Zhou (China)
Songye Zhu (China)

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Kequan Yu
Bin Zhao
Zhiguang Zhou

Friday, December 10

12:00–22:00	Registration	Main Lobby, Kingswell Hotel-Tongji
18:00–21:00	Buffet	1F, Kingswell Hotel-Tongji

Saturday, December 11

08:30–09:00	Opening Ceremony	Lecture Hall, 1F, Office Building, TJAD
09:00–10:30	Plenary Session 1	Lecture Hall, 1F, Office Building, TJAD
	Coffee Break	1F, Office Building, TJAD
10:30–12:00	Plenary Session 2	Lecture Hall, 1F, Office Building, TJAD
12:00–13:30	Lunch	
13:30–15:30	Plenary Session 3	Lecture Hall, 1F, Office Building, TJAD
	Coffee Break	1F, Office Building, TJAD
15:30–17:30	Plenary Session 4	Lecture Hall, 1F, Office Building, TJAD

Sunday, December 12

09:00–10:30	Plenary Session 5	Lecture Hall, 1F, Office Building, TJAD
	Coffee Break	1F, Office Building, TJAD
10:30–12:00	Plenary Session 6	Lecture Hall, 1F, Office Building, TJAD
12:00–13:30	Lunch	
13:30–15:30	Plenary Session 7	Lecture Hall, 1F, Office Building, TJAD
	Coffee Break	1F, Office Building, TJAD
15:30–17:30	Free Discussion	Lecture Hall, 1F, Office Building, TJAD

Detailed Program

Friday, December 10

12:00–22:00 **Registration**
Main Lobby, Kingswell Hotel–Tongji

18:00–21:00 **Buffet**
1F, Kingswell Hotel–Tongji

Saturday, December 11

08:30–09:00	**Opening Ceremony** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Ying Zhou (Tongji University, China)
08:30-08:40	**Welcome Address** Xianglin Gu (Vice President, Tongji University, China)
08:40-08:50	**Introduction of the Kwang–Hua Forums** Xilin Lu (Tongji University, China)
08:50-09:00	**Group Photo**
09:00–10:30	**Plenary Session 1** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Jinping Ou (Harbin Institute of Technology, China)
09:00-09:30	Recent Progress on Seismic Isolation, Energy Dissipation and Vibration Control in China Fulin Zhou (Guangzhou University, China)
09:30-10:00	Topology Optimization of Structures Subjected to Stochastic Excitation, Including Robustness Considerations Billie F. Spencer (University of Illinois at Urbana-Champaign, USA)
10:00-10:30	Bending Shear Beam Modeling for Fast Analysis of Super-tall Buildings with or without Dampers Kazuhiko Kasai (Tokyo Institute of Technology, Japan)
	Coffee Break **1F, Office Building, TJAD**

10:30–12:00	**Plenary Session 2** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Guoqiang Li (Tongji University, China)
10:30-11:00	Introduction of an Innovative Column-in-column System for Vibration Control of Structures Subjected to Earthquake Ground Excitation Hong Hao (Curtin University, Australia)
11:00-11:30	Studies and Implementations of Vibration Damper Techniques for Infrastructures Hongnan Li (Dalian University of Technology, China)
11:30-12:00	Seismic Performance of Multi-CFT Column Piers with Shear Dampers in Continuous Elevated Girder Bridges Yoshiaki Goto (Nagoya Institute of Technology, Japan)
12:00–13:30	**Lunch**
13:30–15:30	**Plenary Session 3** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Ying Zhou (Tongji University, China)
13:30-14:00	Structural Interventions for Sustainability Tamon Ueda (Shenzhen University, China)
14:00-14:30	The Mechanism and Risk Assessments of Liquefaction-induced Seismic Landslides Lanmin Wang (Lanzhou Institute of Seismology, CEA, China)
14:30-15:00	Seismic Reliability Analysis of Infrastructure Systems Consisting of Correlated Components Junho Song (Seoul National University, Korea)
15:00-15:30	Extend the Life of Existing Bridge Piers in Seismic Areas under Chloride Ingress with the Use of Ultra High Performance Fiber Reinforced Concrete (UHPFRC) Camillo Nuti (University RomaTre, Italy)
	Coffee Break **1F, Office Building, TJAD**

15:30–17:30	**Plenary Session 4** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Xilin Lu (Tongji University, China)
15:30-16:00	Structural Dampers for Seismic Disaster Mitigation of Buildings Guoqiang Li (Tongji University, China)
16:00-16:30	Combined Seismic and Environmental Renovation of Existing Buildings and the New European Bauhaus Initiative Paolo Negro (Joint Research Centre - European Commission, Italy)
16:30-17:00	Seismic Analysis of Ancient Greek Temples: Can Parthenon and Acropolis Survive in a Very Low Probability Earthquake? Kyriazis Pitilakis (Aristotle University, Greece)
17:00-17:30	Transnational Access to Earthquake Engineering Research Infrastructures in Europe Fabio Taucer, Georgios Tsionis, Artur Pinto (Joint Research Centre - European Commission, Italy)

Sunday, December 12

09:00–10:30	**Plenary Session 5** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Jianzhong Li (Tongji University, China)
09:00-09:30	Development of Damage-Based Capacity Limit States for Post-Earthquake Assessment of Bridge Columns Sashi K. Kunnath (University of California at Davis, USA)
09:30-10:00	Seismic Structural Health Monitoring - From Theory to Practice Carlos Ventura (The University of British Columbia, Canada)
10:00-10:30	Physical Realization of Rate-independent Linear Damping for the Seismic Protection of Low-Frequency Structures Kohju Ikago (Tohoku University, Japan)
	Coffee Break **1F, Office Building, TJAD**

10:30–12:00	**Plenary Session 6** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Huanjun Jiang (Tongji University, China)
10:30-11:00	Towards Safer Coastal Bridges Subject to Extreme Hazards Ian Buckle, Denis Istrati (University of Nevada Reno, USA)
11:00-11:30	Quasi-static and Dynamic Test on Seismic Behavior of Precast Self-centering Bridge Piers Jianzhong Li (Tongji University, China)
11:30-12:00	Earthquake Response Amplification Characteristics of Non-structural Components in Buildings Junwu Dai (Institute of Engineering Mechanics, CEA, China)
12:00–13:30	**Lunch**
13:30–15:30	**Plenary Session 7** **Lecture Hall, 1F, Office Building, TJAD**
Chair:	Bin Zhao (Tongji University, China)
13:30-14:00	Applying High Performance Steel in Buildings Yongjiu Shi (Tsinghua University, China)
14:00-14:30	The Nexus between Structural Vibration Control and Energy Harvesting Techniques Songye Zhu (Hong Kong Polytechnic University, China)
14:30-15:00	Lateral Instability of Ductile RC Structural Walls: State-of-the-art Rajesh Dhakal (University of Canterbury, New Zealand)
15:00-15:30	A Low-prestressed Self-centering Energy Dissipative Brace: Concept, Experiment and Design Ying Zhou (Tongji University, China)
	Coffee Break **1F, Office Building, TJAD**

15:30–17:30 **Free Discussion**
Lecture Hall, 1F, Office Building, TJAD

Chair: Hong Hao (Curtin University, Australia)
Ying Zhou (Tongji University, China)
Recorder: Richard Henry (University of Auckland, New Zealand)
Mario Aguaguina (Tongji University, China)

Conference Venue

1F, Office Building, Tongji Architectural Design (Group) Co., Ltd. (TJAD)
No.1230 Siping Road, Yangpu District, Shanghai
Tel: +86-21-65987788
同济大学建筑设计研究院（集团）有限公司 办公楼一楼
上海市杨浦区四平路1230号

Live Forum

Live Link:
https://wx.vzan.com/live/tvchat-995977208?v=637732735224238099

Scan the QR code to watch:

Contact

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Kingswell Hotel-Tongji

http://www.kingswelltongji.com/home.html

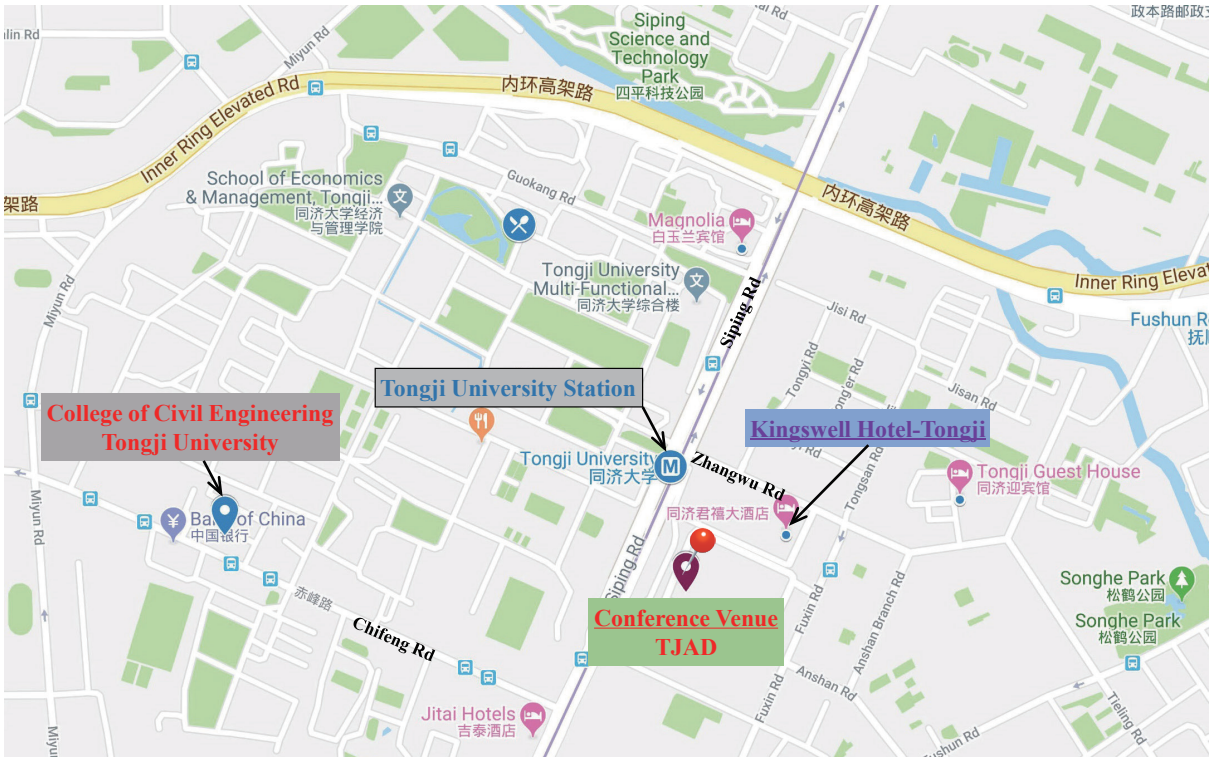
No. 50 Zhangwu Road, Yangpu District, Shanghai

Tel: +86-21-33626868

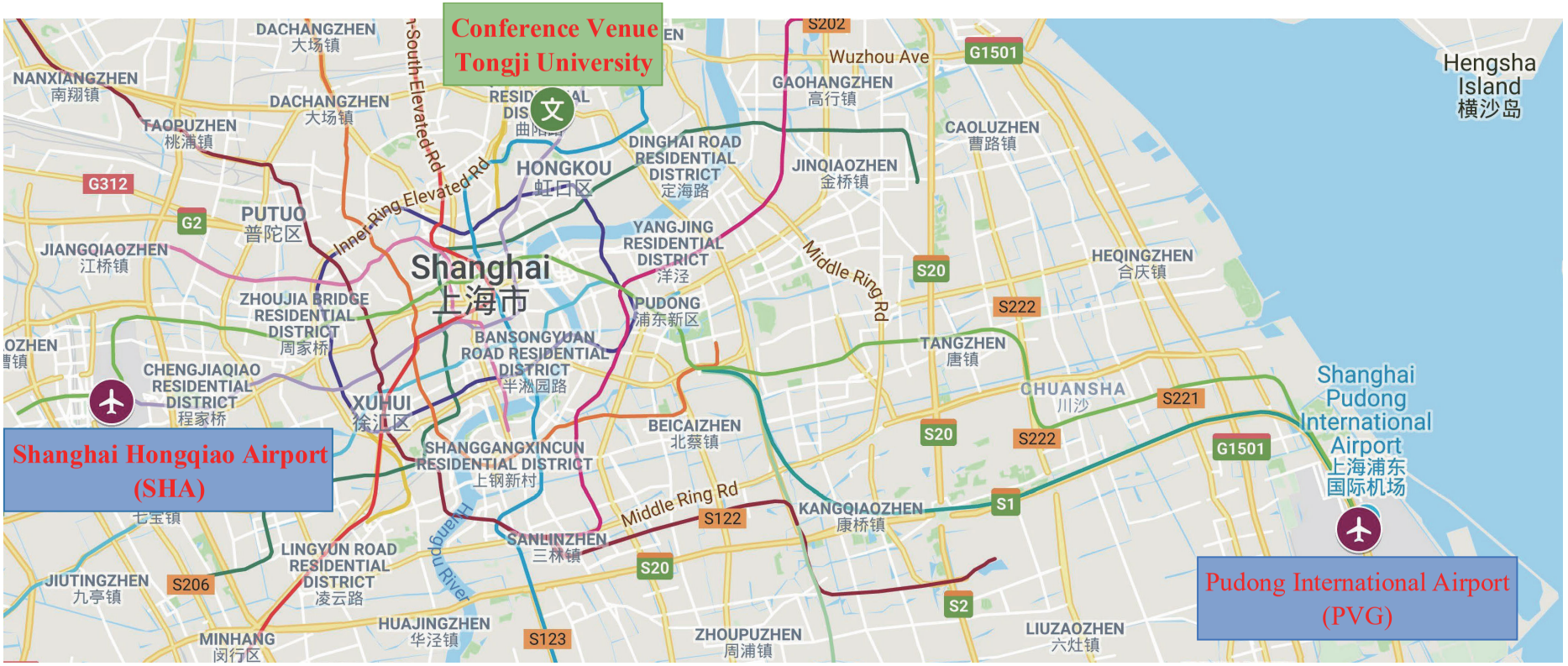
同济君禧大酒店

上海市杨浦区彰武路50号

Local Map



The nearest station to the conference venue is Tongji University of Line 10. Please take Exit 2 to the conference venue (5-minute walk) and Kingswell Hotel-Tongji (3-minute walk).



Taxi: From PVG to the conference venue, it would cost about RMB 180 and takes about 60 minutes.
From SHA to the conference venue, it would cost about RMB 120 and takes about 50 minutes.

Metro: Take Line 2 at the station of Pudong International Airport; interchange the train at the station of Guanglan Road; and interchange for Line 10 at the station of East Nanjing Road; you need to take off at the station of Tongji University and then walk to the registration hotels.
Take Line 10 at the station of Hongqiao Airport; take off at the station of Tongji University, and then walk to the registration hotels.

Shanghai Metro

Access to Tongji University:

PVG — Line 2, 8 stations — Guanglan Rd. — Line 2, 9 stations — East Nanjing Rd. — Line 10, 6 stations — Tongji University

85 minutes
¥ 7

SHA — Line 10, 20 stations — Tongji University

50 minutes
¥ 5

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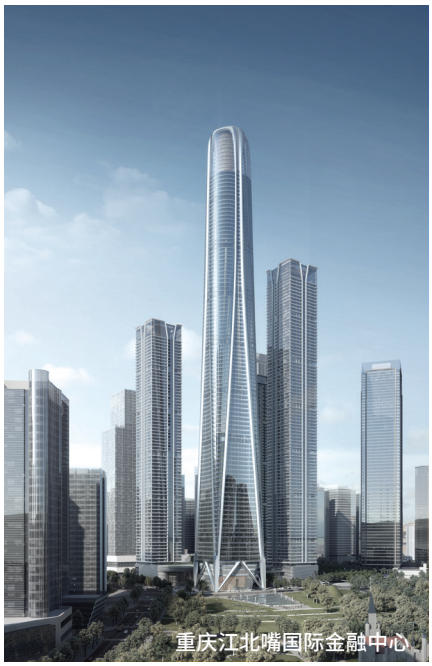
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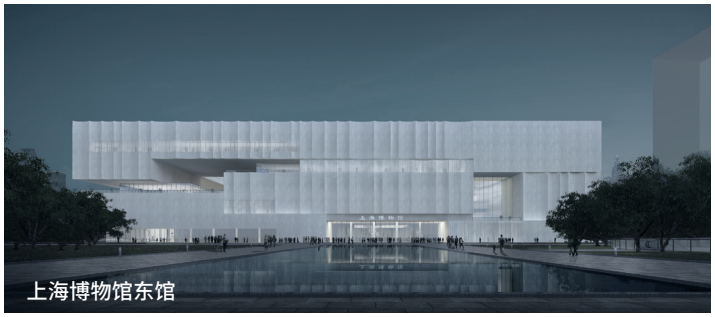
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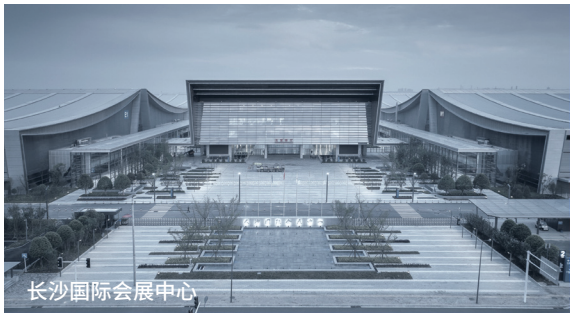
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Shanghai Evolution Building Shift Engineering Co., Ltd.

Shanghai Evolution Building Shift Engineering Co., Ltd has been awarded the titles of “Specialized, Meticulous, Featured and Innovative” enterprise, Shanghai Science and Technology Little Giant Cultivation Enterprise, Pilot Enterprise in Patent Operation, and National Enterprise with Good Credits in Honoring Contracts. The company is a specialized company engaging in building shifting projects, with the qualifications of construction works including building moving engineering, rectification, lift-up, structure reinforcement, conservation and rehabilitation of ancient architecture and relics; The company always focus on offering professional one-stop solutions and all-around technical services involving projects counseling, demonstration, design, construction and monitoring for customers.

Over the last twenty years, the company has accomplished hundreds of various building moving engineering and bridge lifting projects, including the most representative ones such as the moving and lifting engineering of Shanghai Concert Hall, the translation of ancient camphor tree in Sanmen, Zhejiang Province, the moving engineering of Wuzhong Hotel in Ningxia Hui Autonomous Region, the lifting engineering of Second Ring Road Bridge in Chengdu, Sichuan Province and Xianyue Road Bridge in Xiamen, Fujian Province, the active underpinning engineering of Shanghai Dongjiadu God Hall, the translation and lifting engineering of Jade Buddha Temple main hall in Shanghai, the translation and rotation engineering of Houxi Station main station room in Xiamen, Fujian Province, the rotation and shifting engineering of Qishuiwan Tourism Resort in Hainan Province, the overall lifting engineering of the South Building of Huadong Hospital in Shanghai, the underpinning and lifting engineering in Huangpu District 106, Shanghai. The success of those projects not only fills diverse gaps in the field of domestic translation engineering, but always take the lead in bettering the domestic records of lifting height in bridge lifting projects. Many domestic and foreign media, including China Central Television(CCTV), Tencent News, Xinhuanet, CNN, have reported on the company’s representative projects.

Shanghai Evolution Building Shift Engineering Company, who has a strong technical background, equipped by the domestic most up-to-date computer control system and hydraulic devices in moving engineering. The company has independently developed alternate walking equipment and new technologies for alternate jacking and active underpinning that can achieve precise rotary jacking, providing an effective solution to the current core technical problems in urban renewal.The Company has won more than 70 various honors, holds 50 different types of patents, 24 scientific research achievements at provincial and ministerial level, 10 of which have won the awards for science and technology at provincial level, 1 of which has won the Guinness World Record, and is the editor and compiler member for 15 specifications and monographs.

The moving and lifting engineering of Shanghai Concert Hall，covers an area of 1,300 square meters, weighs 5650 tons, has a translation distance of 66.46 meters, and a lifting height of 3.38 meters. The PLC synchronous computer control system in the moving and lifting engineering of Shanghai Concert Hall is applied in the translation and lifting engineering for the first time, creating a milestone in the translation and lifting

The translation and rotation engineering of Houxi Station main station room in Xiamen，the moving building area are 21764 square meters, the total weight are 32,000 tons, and the longest arc of the building's rotation and translation are 288.24 meters. The translation and rotation engineering of Houxi Station main station room in Xiamen has won the Guinness World Record of "the longest arc length of the entire building's rotational movement".

The overall lifting engineering of the South Building of Huadong Hospital in Shanghai，the construction area are 10702 square meters, weighs 25000 tons, and has a lifting height of 1.2 meters. The overall lifting engineering of the South Building of Huadong Hospital in Shanghai is now the largest cultural relic building lifting and seismic isolation reconstruction engineering in the country.

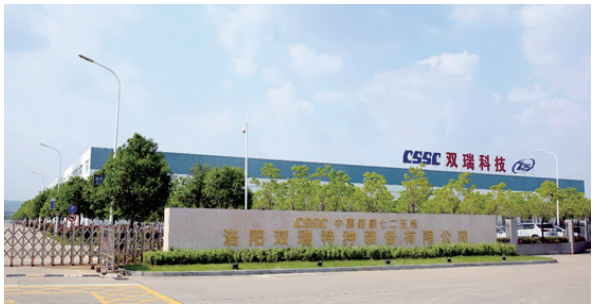
The lifting engineering of Yihe Bridge, Beijing Road, in Linyi，has a total length of 1210.72 meters, a lifting height of 3.1 meters, and a lifting area of 2680 square meters. The lifting engineering of Yihe Bridge in Shangdong province is the lifting and reconstruction engineering of single bridge with the largest synchronous lifting area and longest length in China.

Sponsors

Luoyang Sunrui Special Equipment Co., Ltd.

Established in 2005, Luoyang Sunrui Special Equipment Co., Ltd is a holding subsidiary of Luoyang Ship Material Research Institute from CSSC Group. Its headquarters are in Luoyang, Henan province, China. In 2021, after the mergers with Wuhan Hirun Engineering Equipment Co., Ltd of WMMP from CSSC Group, Luoyang Sunrui sets up Wuhan branch and expands its capabilities in Bridge Construction Safty Equipment from company's 5 major fields, other 4 fields are Pipeline Safety Equipment, Energy-efficient Equipment, High-strength Anti-corrosion Special Material Products, Clean Energy Storage & Transportation Equipment. Following the guideline of "technology-based, innovative leaps, civil-military integration and achieving stronger industry" from CSSC Luoyang Ship Material Research Institute, the company provide customers with highly reliable products and integrated solutions. With human-oriented concept of "achieving success and enjoying life for employees", it has formed a high-tech product industrial base with perfect combination of research, production and test system of special materials and products. Its products have been wwidely used in transportation, shipping, petrochemical industry, mettallurgy, electric power and other industries, and have been exported to Europe, the USA and other countries and regions.

The company has a title of National-Level Enterprise Technology Center and a title of National Torch Plan Key High-Tech Enterprise, and it owns 5 provincial engineering laboratories. For Bridge Construction Safty Equipment, it has national production license for industrial products, CRCC railway product certificate, CE certificate and has undertaken a number of national issues and "863" projects. The company has an advanced bearing & anti-seismic device testing platform with CNAS certificate and formed extensive cooperation with research institutions and universities.



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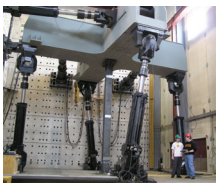
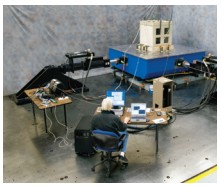


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