

Preface

The 4th International Conference on Civil Engineering and Transportation took place in Kunming, China, December 24-25, 2014. The impact of construction technology and transport infrastructure development is known to be significant on the economy of any country. Therefore, the International Conference on Civil Engineering and Transportation is aspired to promote construction practices and create awareness among different industry professionals. And the main aim of this conference is to bring together academics and other professionals from all over the world, for the presentation and exchange of their thoughts and experiences on concepts, trends and practices in civil engineering and advanced transportation fields. The conference is intended to offer a stimulating environment to encourage discussion and exchange of ideas leading to the advanced construction technology and transportation.

All the papers in the conference proceedings have been undergone the intensive review process performed by the international technical committee, and only accepted papers are included. This volume comprised the selected papers from the subject areas of Structural Engineering; Geotechnical Engineering and Geological Engineering; Bridge Engineering; Earthquake Engineering; Tunnel, Subway and Underground Facilities; Hydraulic Engineering, Water Supply and Drainage Engineering; Coastal Engineering; Surveying Engineering, Cartography and Geographic Information Systems; Ecological Architecture and Energy Consumption, Energy Saving, Heating, Gas Supply, Ventilation and Air Conditioning Works; Disaster Prevention and Mitigation Engineering; Computational Mechanics and Mathematical Modeling; Construction Project Planning and Monitoring; Roads, Railway Engineering and Landscape Design; Transportation Planning, Construction and Operation Organization; Modern Logistics Systems and Supply Chain; Automotive Engineering and Other Vehicle Tools; Intelligent Transportation Theory and Application; Transportation Control and Information Technology; Transportation and Economic Development, and Low Carbon Transportation; Public Transport Planning and Management; Architectural Design and Theory; Building Technology and Science; Urban Planning and Design, Landscape Design; Environmental Engineering and Environmental Protection; Sustainable City and Regional Development; Building Materials, Processing Technology and Applications.

We would like to acknowledge and give special appreciation to our keynote speakers for their valuable contribution, our delegates for being with us and sharing their experiences, and our invitees for participating in this conference. We would also like to extend my appreciation to the steering Committee and the International Scientific Committee for the devotion of their precious time, advice and hard work to prepare for this Conference.

The editors

Conference Organization

Chairman

Prof. Yishan Pan, Liaoning Technical University, China

International Scientific Committee

Prof. J. H. Bungey, University of Liverpool, Liverpool, UK

Prof. K. J. Bathe, Massachusetts Institute of Technology, USA

Prof. Lawrence C. Bank, University of Wisconsin-Madison, USA

Prof. Longsheng Bao, Shenyang Jianzhu University, China

Prof. Xiangdong Zhang, Liaoning Technical University, China

Prof. Chaohe Chen, South China University of Technology, China

Prof. Xianglin Gu, Tongji University, China

Prof. Xiating Feng, Institute of Rock and Soil Mechanics, CAS

Prof. Hongnan Li, Dalian University of Technology, China

Prof. Zhihua Chen, Tianjin University, China

Prof. Jian-Fei Chen, the University of Edinburgh, UK

Prof. Shucaï Li, Shandong University, China

Prof. Lai Wang, Shandong University of Science and Technology

Prof. Xin'gang Zhou, Yantai University, China

Prof. Xuejun Zhou, Shandong Jianzhu University, China

Prof. Feng Fan, Harbin Institute of Technology, China

Prof. Luciano Feo, University of Salerno, Italy

Prof. Han-Bin Ge, Meiju University, Japan

Prof. Haiyan Guo, Ocean University of China

Prof. Zong Woo Geem, iGlobal University, USA

Prof. Linhai Han, Tsinghua University, China

Prof. Yong Huang, Guizhou University, China

Prof. Jiping Hao, Xi'an University of Architecture and Technology, China

Prof. I. E. Harik, University of Kentucky, USA

Prof. David Hui, University of New Orleans, USA

Prof. Tan Kiang Hwee, National University of Singapore

Prof. Tim Ibell, University of Bath, UK

Dr. Tianjian Ji, The University of Manchester, UK

Prof. A. Kaveh, Iran University of Science & Technology, Iran

Prof. Guoqiang Li, Tongji University, China

Prof. Lijuan Li, Guangdong University of Technology, China

Prof. Shucai Li, Shandong University, China

Prof. Zhongxian Li, Tianjin University, China

Prof. Qiusheng Li, Hong Kong City University, Hong Kong

Prof. Kang Seok Lee, Chonnam National University, South Korea

Prof. Marcus M.K. Lee, the University of Southampton, UK

Prof. Zhengliang Li, Chongqing University, China

Prof. Zhengnong Li, Hunan University, China

Prof. Guangfan Li, Hainan University, China

Prof. Xiliang Liu, Tianjin University, China

Prof. Yew-Chaye Loo, Griffith University, Australia

Prof. Yaozhi Luo, Zhejiang University, China

Prof. Ayman Mosallam, Univ of California Irvine, USA

Prof. Aftab Mufti, University of Manitoba, Canada

Prof. Antoine E. Naaman, University of Michigan, USA

Prof. Hamid Ronagh, The University of Queensland, Australia

Prof. R. Sri Ravindra rajah, University of Technology, Australia

Prof. Yongjiu Shi, Tsinghua University, China

Prof. Xingping Shu, Hunan University, China

Prof. Ramiro Sofronie, University of Bucharest, Romania

Prof. M. N. Soutsos, University of Liverpool, Liverpool, UK

Prof. Mark G Stewart, The University of Newcastle, Australia

Prof. Dasui Wang, Shanghai Xiandai Architechural Design(Group) Co.,Ltd.

Prof. B. H. V. Topping, Heriot-Watt University, Edinburgh, UK

Prof. Tamon UEDA, Hokkaido University, Japan
Prof. Guangyue Wang, Shandong University, China
Prof. Lai Wang, Shandong University of Science and Technology, China
Prof. Yan Wang, Qingdao Technological University, China
Prof. Jinfeng Wang, Huaqiao University, China
Prof. Zhi-Shen Wu, Ibaraki University, Japan
Prof. Shi Yan, Shenyang Jianzhu University, China
Dr. Scott T. SMITH, Hong Kong University, Hong Kong
Prof. J-G. Teng, Hong Kong Polytechnic University, Hong Kong
Prof. Xin Zhang, Shandong Jianzhu University, China
Prof. Yigang Zhang, Beijing University of Technology, China
Prof. Xin'gang Zhou, Yantai University, China
Prof. Xuejun Zhou, Shandong Jianzhu University
Prof. Yanpeng Zhu, Lanzhou University of Technology, China
Prof. Chaoying Zou, Harbin Institute of Technology, China
Prof. Jiru Zhang, Wuhan University of Technology, China
Prof. Chuangbin Zhou, Wuhan University, China

Local Organizing Committee

Prof. Xiangdong Zhang, Liaoning Technical University, China
Prof. Bin Zhang, Liaoning Technical University, China