



THE HONG KONG  
POLYTECHNIC UNIVERSITY  
香港理工大學



DEPARTMENT OF  
CIVIL AND ENVIRONMENTAL ENGINEERING  
土木及環境工程學系

CEE



National Rail Transit Electrification and Automation  
Engineering Technology Research Center  
(Hong Kong Branch)  
國家軌道交通電氣化與自動化工程技術研究中心  
(香港分中心)



## Seminar on Automation and Informatics in Civil Engineering

Prof. Genda Chen

*Missouri University of Science and Technology, USA*

### ABSTRACT

Recent developments in robotic technology and measurement science can potentially revolutionize the way and process that civil infrastructures are constructed and preserved. In this grand yet challenging transition era, automation and informatics are two emerging concepts that will generate a wide range and long list of innovations in civil engineering. In this presentation, new developments and potential applications of nondestructive evaluations, sensing systems, imaging systems, data analytics, climbing robots, unmanned aerial vehicles (UAV), and 3D printing technologies will be introduced and reviewed. For new construction, how 3D printing of concrete and UAV can change the construction industry of civil infrastructures will be discussed. For preservation of existing infrastructures, how sensing and imaging systems and robots can be integrated into the current practice of visual inspection in a systematic framework, thus transforming the current ad-hoc approach to a data-driven management of bridges, will be discussed. Throughout this presentation, the example research activities that are on-going under the auspices of the five-year INSpecting and Preserving Infrastructure through Robotic Exploration (INSPIRE) University Transportation Center led by Missouri University of Science and Technology will be used to illustrate the emerging roles in civil engineering.

Date:

21 December 2018 (Friday)

Time:

10:30am-12:00pm

Venue:

Room V302, Innovation Tower, Block V, PolyU

### SPEAKER'S BIOGRAPHY

Dr. Genda Chen is Professor and Abbett Distinguished Chair in Civil Engineering, Director of INSPIRE University Transportation Center, Director of System and Process Assessment Research Laboratory, and Associate Director of Mid-America Transportation Center at Missouri University of Science and Technology (Missouri S&T). Dr. Chen received his Ph.D. degree from State University of New York at Buffalo in 1992 and joined Missouri S&T (then University of Missouri-Rolla) in 1996 after over three years of bridge design, inspection, and construction practices with Steinman Consulting Engineers in New York City. He was granted three patents and authored over 350 publications in structural health monitoring, smart structures, interface mechanics and deterioration, bridge engineering, and multi-hazard effects. He received the 1998 National Science Foundation CAREER Award, the 2004 Academy of Civil Engineers Faculty Achievement Award, and the 2009, 2011, and 2013 Missouri S&T Faculty Research Awards. He is Chair of the 9<sup>th</sup> International Conference on Structural Health Monitoring of Intelligent Infrastructure in 2019, Editor of Intelligent Sensors, Associate Editor of the Journal of Civil Structural Health Monitoring, Editorial Member of Advances in Structural Engineering, and Vice President of the U.S. Panel on Structural Control and Monitoring. He was elected to American Society of Civil Engineers (ASCE) Fellow in 2007 and Structural Engineering Institute (SEI) Fellow in 2013. In 2016, he was nominated and inducted into the Academy of Civil Engineers at Missouri S&T and became an honorary member of Chi Epsilon.

\*\*\* All Interested Are Welcome \*\*\*

For further information, please contact Miss Autumn Lin at Tel. 3400 8535.  
Certificates of attendance will be provided to participants if they attend the whole lecture.