Chung-Yue Wang

cywang@cc.ncu.edu.tw



Chung-Yue Wang is a professor in the Department of Civil Engineering at the National Central University. He is also the Director of the Institute of Bridge Engineering of the China Engineering Consultants, Inc. He received his Ph.D. degree in Aerospace Engineering & Engineering Mechanics from the University of Texas at Austin. He had been Postdoctoral Research Associate of the National Center for

Composite Material Research at UI Urbana-Champaign. He had also been a visiting professor at Stanford UC Berkeley and University of Texas at Austin, respectively. He was the Director of Center for the Bridge Engineering Research of the National Central University, Taiwan, during 2005-2009. Dr. Wang research interests include nondestructive testing, structural health monitoring, computational mechanics of discontinuous deformable system, impact dynamics.

Chung-Yue Wang

cywang@cc.ncu.edu.tw

Professor Department of Civil Engineering National Central University Chungli 32001, Taiwan

An Integrated Risk Assessment on Bridges

The comprehensive and quantitative risk assessment of bridges under the mega-hazards should include structural, hydrologic, metrological, geotechnical, geophysical, numerical and experimental investigations. An information platform that archives all the fundamental and historical data related to the lifeline infrastructures to be evaluated is the core of the whole risk assessment and management. However, some data for the risk analysis were not collected or invalid due to the environmental effects and then the nondestructive testing (NDT) techniques can be used to identify the current conditions of the structure and its analysis domain. These data will be used to establish the risk analysis model. Since the ultimate and failure states of the structures under natural hazards are expected to be predicted for the risk assessment, advanced simulation techniques are required to handle the complicated behaviors like the fluid-structural interaction, multi-bodies dynamics, large deformation and collapse of structures. Hence, an integrated risk assessment mechanism including data management, NDT and 3D nonlinear, dynamic computation analysis should be established to provide a comprehensive and effective assessment.



Fig. 1 Collapse of the Shuang-Yuan Bridge of Taiwan during Typhoon Morakat in the August of 2009



Fig. 2 Simulation of local scouring at a pier.



Fig. 3 Detection of the foundation size by resistivity image profile (RIP)