THE UNIVERSITY OF HONG KONG

DEPARTMENT OF CIVIL ENGINEERING

SEMINAR

Nonlinear Stochastic Dynamic Analysis Method for Slope Behavior under Earthquake Excitation

Professor HUANG Yu
Tongji University
China

Date: April 10, 2024 (Wednesday)
Time: 10:00 a.m. – 11:00 a.m.
Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

Abstract

Slope disasters triggered by earthquakes have resulted in significant human casualties and extensive economic losses. In order to address these challenges, our research focuses on key scientific issues and essential technologies in the seismic design and assessment of slopes. Our work begins by establishing an intensity-frequency non-stationary random earthquake model, enabling a comprehensive probabilistic representation of earthquake randomness. We introduce the concept of stochastic dynamic systems and propose a nonlinear stochastic dynamic analysis method for slope engineering based on the evolution of probability density. Additionally, we investigate the impact of nonlinear spatial variability in rock and soil masses, elucidating the laws governing probability density transport and propagation in slope engineering. Through large-scale seismic shaking table model tests, we unveil the dynamic coupling mechanism between randomness and the nonlinear response of rock and soil in complex slope systems. Furthermore, we leverage artificial intelligence methods to explore the prediction of nonlinear seismic dynamic responses in slopes.

About the Speaker

Professor Huang Yu is a Distinguished Professor at Tongji University. With a distinguished career, Huang Yu has been recognized with numerous prestigious awards and honors, including the National Science Fund for Distinguished Young Scholars, the Yangtze River Scholar Distinguished Professorship from the Ministry of Education, and the State Council Special Government Allowance. He has also been the recipient of notable accolades such as the Huang Jiqing Youth Geological Science and Technology Award, the Gu Dezhen Youth Science and Technology Award, the Baosteel Outstanding Teacher Award, and the International Geology Disaster and Disaster Reduction Association Scientific Achievement Award. Huang Yu's research has been widely acknowledged, with over 180 SCI papers and 5 monographs published. He has also obtained more than 20 national invention patents and 6 software copyrights. His exceptional work has been recognized with prestigious awards, including the first prize of the Science and Technology Progress Award of the Ministry of Education and the first prize of the Shanghai Natural Science Award, among others.

- ALL ARE WELCOME -

JY/plt