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Department of Civil and Environmental Engineering

Developing an AI-Based Mobile App for Aiding Rock Core Logging

by

Associate Prof Louis Wong

Director of the MSc in Applied Geosciences program
Department of Earth Sciences in the University of Hong Kong

Host: Associate Prof Darren Chian Siau Chen

Date: 26 May 2023, Friday
Time: 4.00 pm – 5.00 pm
Venue: E1-06-05
National University of Singapore
College of Design and Engineering
3 Engineering Drive 2
Singapore 117578

Scan code to register

Seats are limited. Please register early. All are welcome and admission is free

Abstract

Digital technologies have the potential to greatly enhance geotechnical work, revolutionizing the field by increasing efficiency and capabilities. Geologists and other geotechnical professionals often spend considerable time logging rock cores and producing ground investigation records, which are essential for engineering geological modeling and geotechnical engineering practices. By utilizing advancements in computer vision-based AI technology and the widespread use of smart mobile devices, an ongoing project aims to develop a mobile app to streamline the process of rock core logging. Using users' uploaded core box photographs, the app can classify fresh and weathered igneous rocks and automatically identify fractures in rock cores, enabling the calculation of common fracture indices. This information is crucial for predicting the state of rock fractures. This presentation will introduce the AI approach, computation algorithms, assumptions, and limitations of the project, with the hope of inspiring practitioners, researchers, and students to think about the future of geotechnical engineering.

Speaker's Biography

Dr. Louis Wong is an Associate Professor and Director of the MSc in Applied Geosciences program at the Department of Earth Sciences in the University of Hong Kong (HKU). Holding a PhD from MIT and a BSc from HKU, he has amassed invaluable experience working on diverse slope engineering and underground construction projects across Hong Kong, Singapore, and the United States. Dr. Wong has authored over 180 journal articles and conference publications in engineering geology, rock mechanics, and underground engineering. He belongs to

the top 1% of researchers worldwide based on citations in his field. In addition to receiving numerous awards and presenting keynote lectures at international conferences, he was honored with the prestigious Richard Wolters' Prize (2014) by the International Association of Engineering Geology and the Environment. Dr. Wong has been the Editor-in-Chief of the Bulletin of Engineering Geology and the Environment (BOEG) since 2018. His current research interest lies in developing predictive models for thermo-hydro-mechanical (THM) coupling processes in geomechanics, and leveraging AI technologies to enhance geological and geotechnical industry practices.

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Map of Seminar Room E1-06-05, 3 Engineering Drive 2, Singapore 117578