

LEVERAGING DATA AND MACHINE LEARNING IN GEOTECHNICAL AND INFRASTRUCTURE APPLICATIONS

Speaker

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Abstract

This seminar presents insights into leveraging data and applying machine learning in geotechnical engineering and infrastructure, highlighting four key areas of ongoing research: (i) tunneling, (ii) pipelines, (iii) landslides, and (iv) soil mechanics. First, it explores the development of intelligent systems for tunneling, focusing on the use of machine learning to analyze tunnel boring machine (TBM) data for real-time ground condition inference and risk-informed decision-making. Second, it introduces a data-driven, evidence-based framework for assessing pipeline conditions, aimed at improving repair and replacement strategies for aging underground utility networks. Third, it examines the application of geostatistical methods and machine learning for spatial modeling in landslide susceptibility assessment, demonstrating how geospatial data can be leveraged to enable more accurate and scalable hazard prediction. Finally, it briefly presents an effort to develop a next-generation soil constitutive model that relies solely on simple soil properties obtained from disturbed soil testing.

Biography

Prof. Reini Wirahadikusumah is a professor of Infrastructure Engineering and Management at the Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung (ITB). She served as Rector of ITB from 2020 to 2025, becoming the first woman to lead the university since its founding in 1920. Prof. Reini earned her Ph.D. in Civil Engineering from Purdue University, USA, and her research focuses on infrastructure systems and disaster management. In this seminar, she will provide a brief introduction to ITB, one of Indonesia's leading institutions in science, engineering, and technology.

Dr. Dayu Apoji is an Assistant Professor at the Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung (ITB). Before joining ITB, he was a Postdoctoral Researcher at the Center for Smart Infrastructure, University of California, Berkeley, USA. He also previously worked as a consulting engineer at AECOM in Singapore. Dr. Dayu holds a Ph.D. in Civil and Environmental Engineering from UC Berkeley and an M.Sc. from Imperial College London, UK. His research focuses on data and computing for geohazard analysis and geotechnical infrastructure applications. In this seminar, he will share insights from his past and ongoing research titled 'Leveraging Data and Machine Learning in Geotechnical and Infrastructure Applications.'



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10:30 am - 12:00noon



Civil Engineering
Conference Room
Room 3574 (Lift 27/28)

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