

# REDRAWING THE BOUNDARIES OF “SIMILAR” SITES

Speaker

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## Abstract

One important challenge in data-driven site characterization (DDSC) is the “site recognition challenge”. It shares some similarities with the facial recognition challenge. The purpose of recognizing “similar” sites is to allow a target site data to be augmented by relevant data collected elsewhere to improve decision making at the target site. This is already widely adopted in geotechnical engineering practice. The key difference is that “similar” sites are identified based on judgment. The problem with judgment is that it is restricted to local/regional data that an engineer is familiar with arising from prior experience working under similar ground conditions. It is impractical to exercise judgment on big data, say to process a trillion soil records. Judgment is arguably less applicable to ground conditions outside of an engineer’s experience base.

The tailored clustering has been shown to be more effective than classical clustering (reference solution) in identifying “similar” sites from big indirect data (BID). However, all DDSC methods face a fundamental limitation: their reliance on geotechnical project boundaries as the primary site definition. This definition is purely based on land use - it is evident that project boundaries are not related to any subsurface conditions such as geology or geotechnical properties. This lecture shows that it is possible to redraw the boundaries of “similar” sites based on geology/geotechnical data so that decision making at a target site is optimized. The concept of a data-driven demarcated site is novel and may open new research possibilities for DDSC.

## Biography

PHOON Kok-Kwang is President, Singapore University of Technology and Design (SUTD), as well as Cheng Tsang Man Chair Professor. Concurrently, he is serving as the Deputy Executive Chair (Research) of AI Singapore and a member of the Committee of Government Scientific Advisors. He has also served as the Deputy Chief Scientific Advisor (DCSA) to the National Research Foundation, Prime Minister’s Office, Singapore. He has been elected to serve on the board of the International Council of Academies of Engineering and Technological Sciences (CAETS), 2026-2027.

Prof Phoon is a world leader in the development of reliability and data-centric geotechnics. He was bestowed the ASCE Norman Medal twice in 2005 and 2020, the Humboldt Research Award in 2017, the Harry Poulos Award in 2023, and the Alfredo Ang Award in 2024 among other accolades. Prof Phoon is the Founding Editor of Georisk and Founding Editor-in-chief of Geodata and AI.



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

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