香港岩土及岩土環境工程專業協會
ASSOCIATION OF GEOTECHNICAL &
GEOENVIRONMENTAL SPECIALISTS (HONG KONG)

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ANNOUNCEMENT

AGS (HK) Technical Seminars

BIM-Integrated Ground Modelling & Voxel Modelling by

Mr. Dennis Wong (Project Geologist, Arup) & Ms. Taurus Yong (Assistant Geologist, Arup)

Topic 1: A BIM-Integrated Ground Modelling Approach for Fast-Paced Infrastructure Project
Topic 2: Voxel Modelling for Regional-scaled Geotechnical Assessment

Date : Thursday, 23 January 2025

Time : 18:30 – 19:30 (Hong Kong Time)

Venue : The webinar will be conducted through Zoom.

Successful applicants will be informed by emails with a Zoom's link to the webinar. Participants should arrange for their own device with a stable network environment to join the webinar.

Enquiry : agshk.org@gmail.com

Fee : Free of charge

Registration : https://www.ags-hk.org/event-details/bim-integrated-ground-modelling-voxel-modelling

Please register by 18:30 on 23 January 2025. Successful applicants will receive webinar details after registration. CPD certificate will be sent to the attendees, who attended more than 80% oßf the webinar time, within 2 weeks after the webinar.

Book Prize : Professionals under 35 years of age are encouraged to submit a Book Prize Report (max. 500 words) on webinars and site visits arranged by AGS (HK).

Contributors to successful Book Prize Reports will be awarded a Book Prize that comprises of a book "Geology of Site Investigation Boreholes in Hong Kong" written by Chris Fletcher, and a coupon of HK$500 for Eslite Spectrum (誠品生活) or equivalent. The successful Book Prize Report will also be published on the AGS (HK) website to showcase your accomplishment.

Prior to report submission, please refer to the "The AGS Book Prize Reports – Assessment Framework"* on the AGS (HK) website. You may submit your Book Prize Report to our assessors by uploading the report file through the AGS (HK) website at https://www.ags-hk.org/book-prize. Should you have any questions, please contact us at agshk@meinhardt.com.hk.

***Link to the AGS Book Prize Reports – Assessment Framework:**
https://www.ags-hk.org/_files/ugd/521a4c_b9449603473248468744 1cf4ed4d0bf9.pdf

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Synopsis:

A BIM-Integrated Ground Modelling Approach for Fast-Paced Infrastructure Project

Traditional 2D approaches using software packages like Surfer and Bentley gINT / holeBASE have limitations. They require manual determination of strata relationships, leading to subjective interpretations and inconsistency across sections. Visualisations are limited, and updates are challenging when new data emerges.

To overcome these challenges, a BIM-integrated 3D ground modelling approach is proposed. Using Seequent Leapfrog, ground data is synthesised to develop a preliminary 3D model. The workflow in the Seequent Leapfrog software allows for dynamic updates, progressively reducing uncertainty and generating a final resultant ground model. It provides a platform for visualising complex stratigraphic sequences, streamlining design procedures, and interpreting site-specific conditions. The 3D model integrates well with other BIM software, promoting communication and benefiting mega-scale projects.

A project will be used as the case study to highlight the benefits of the new modelling approach.

Voxel Modelling for Regional-scaled Geotechnical Assessment

Voxel modelling is a powerful tool for representing multidimensional spatial and temporal data in a 3D volumetric format, enabling high-resolution visualisation and analysis for geotechnical applications. Voxel layers are particularly well-suited for regional-scale geotechnical assessment, as they provide the ability to integrate and interpret complex subsurface information at high resolution. These layers can represent a variety of real-world phenomena, including geological underground models, atmospheric or oceanic data, or even space-time cubes for dynamic processes.

To create a voxel model for geotechnical assessment, the process begins with the borehole data, used to extract geotechnical strata elevations and construct 3D geotechnical surfaces. Voxel values are then assigned based on stratigraphy to create a volumetric model. The voxel volumetric model can then be visualised in GIS environment alongside features like 3D borehole sticks for enhanced interpretation. This methodology leverages open-source tools and data, ensures accessibility and reproducibility, while maintaining high accuracy and flexibility in model development.

By integrating voxel layers with spatial data such as borehole logs, construction plans, or geological maps, engineers gain actionable insights to optimise designs, assess risks, and make informed decisions. This approach offers a cutting-edge, cost-effective solution for geotechnical analyses.

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About the Speakers:

Mr. Dennis Wong is a Chartered Geologist (CGeol) who is well trained in slope engineering, ground modelling, and ground condition assessments for infrastructure and development projects as well as tunnels and caverns, in both Hong Kong and overseas. His extensive background encompasses natural terrain hazard studies, design and supervision of ground investigation works, slope engineering, landslide assessments and analyses. He also has proficiency in rock mechanics and rock mass classification. In addition to his technical pursuits, Dennis is committed to knowledge dissemination and has taken up teaching roles in various educational institutions to nurture future generations of professionals.

Ms. Taurus Yong is an engineering geologist with expertise in ground investigation, ground characterization and geohazard risk assessment. She holds a Bachelor's degree from The Chinese University of Hong Kong (CUHK) and a Master of Science in Applied Geoscience from The University of Hong Kong (HKU). Taurus is a Fellow of the Geological Society of London (FGS) with over 4 years of experience in geotechnical engineering. Taurus has contributed to a variety of large-scale infrastructure projects in Hong Kong and internationally. Her project experience ranges from assessing geological and geotechnical constraints, reviewing ground investigation data, and interpreting soil and rock properties to designing mitigation measures for natural terrain hazards.