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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AGS (HK) Technical Seminar

Underground Global Navigation Satellite System in Realtime Continuous Monitoring of Utilities Settlement

By

Ir Lo King Yin, Victor 盧敬賢工程師

and Ir Dr Yang Wentao, Owen 楊文韜 博士

Date : 27 March 2025

Time : 18:30 – 19:30 (Hong Kong Time)

Venue : The webinar will be conducted on Zoom platform.

Enquiry : agshk.org@gmail.com

Fee : Free of charge

Registration : Please apply by using the following registration link :

https://www.ags-hk.org/event-details/underground-global-navigation-satellite-system-in-realtime-continuous-monitoring-of-utilities-settlement

Please register by 27 March 2025 at 18:30. Successful applicants will receive webinar details after registration. CPD certificate will be sent to the attendees, who attended more than 80% of the webinar time, within 2 weeks after the webinar.

(The successful applicants for the seminar will be informed by email.)

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:

By the 2020s, the completion and global operation of the BeiDou Navigation Satellite System (BDS) marked a significant milestone. With the inclusion of the BDS in the Global Navigation Satellite System (GNSS), the number of satellites available for positioning significantly increased. This expansion has resulted in the advancement of real-time precise monitoring capabilities for deformation monitoring in engineering survey, particularly in areas where satellite signal obstruction is prominent. Such areas include high-rise buildings, canyons, slopes, or regions even with dense vegetation or structures.
The speakers will share their insights on using GNSS technology to real time continue monitor underground utilities equipped with GNSS devices installed below the ground, achieving real-time continuous monitoring with 2 mm accuracy. A case study will be presented, highlighting the application of GNSS high-resolution data for risk reduction and maintenance monitoring.
The use of GNSS in continuous monitoring of underground utilities settlement (U-GNSS) won the Silver Award in Geneva Internation Innovation Competition 2024.

About the Speakers:

Ir LO King Yin, Victor
BSc.(CVL), Dip(Management Studies), FHKIE, FHKCI, FHKICA, RPE(CVL), NEC4 DBO:SM, NEC4 TSC:SM, FQME(Certification), SE(INM-CT), SE(NM-CT), 正高級工程師 **(**土木建築**)**

Victor is an experienced civil engineer with in-depth knowledge in water supply engineering. He had worked in the Water Supply Department and Electrical & Mechanical Services Department for nearly 40 years. His professional interest including network management, leakage management dam engineering. During his post to work in the Development Bureau for managing the reconstruction works after the Sichuan Wenchuan earthquake in 2009, he had promoted the use of seismic isolation in the reconstruction projects such as schools, hospitals and bridges. After his retirement from the Hong Kong SAR government, he continue to work as consultant to the Hong Kong District Cooling Limited.

He has devoted himself in serving professional institutions including the HKIE, HKCI, HKICA and HKIWSS for years. He had been the Council member, the past Chairman of the Civil Division and Civil Discipline Advisory Panel in the HKIE. In HKICA and HKIWSS, he is now serving the Chairman of the CPD Committee to develop the needs for the members in continuing professional education. Since 2022, he is appointed as a member in the Engineer Registration Board. He had published 11 papers and was invited to deliver talks on his expert subjects from time to time.

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Ir Dr YANG Wentao, Owen
BSc., PhD, MHKIE

Owen is a recognized expert in Global Navigation Satellite System (GNSS) technology, boasting over ten years of research experience at Hong Kong Polytechnic University. His work primarily focuses on developing mathematical models for GNSS data processing. Notably, Owen invented a system that utilizes underground GNSS technology by installing devices beneath the road. This innovation enables continuous automated monitoring of surface and underground utility subsidence. During his tenure, he also created a GNSS-based monitoring platform and designed GNSS hardware, resulting in a fully automated real-time monitoring solution.

This solution has been successfully applied in numerous significant monitoring projects, including the subsidence monitoring of the third runway reclamation project at Hong Kong Airport, the monitoring of land reclamation in Tung Chung New Town, and the dynamic and static load monitoring of the Second Penang Bridge in Malaysia. Overall, Owen's expertise has been instrumental in over 100 projects across Hong Kong, mainland China, Taiwan, and South Korea, where his GNSS-based monitoring solution has been extensively utilized.