



Malaysian Geotechnical Society

WEBINAR ON STATE-OF-THE-ART INSTRUMENTATION OF SLOPES AND RETAINING STRUCTURES WITH FIBRE OPTIC SENSORS

23rd June 2021 (Wednesday) 5.00 pm – 7.00 pm

BEM Approved CPD Hours: 2 Ref. No.: IEM20/PP/016/T(w)



SPEAKER:
IR. DR. HISHAM MOHAMAD

Registration Fee:
MGS / IEM / GeoSS Members: FREE
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SYNOPSIS

In recent years, several fibre optic sensors (FOSs) have been proposed for measurement of strains in geotechnical applications, including landslide monitoring. Efforts have been made in the last ten years or more to correlate between the dynamics of landslides and the strain measured by optical fibre sensors. The embedded FOS can be in the form of inclinometer tube, extensometer, geo-textiles, soil nails, ground anchors, and many more. Distributed Optical Fibre Strain Sensing (DOFSS) technology on the basis of Brillouin Optical Time Domain Reflectometry/ Analysis (BOTDR or BOTDA) offers new possibilities of detecting deformation of large ground mass and able to pinpoint accurately the location of ground slip (the boundary of failure zones of a certain landslide). The sensor is capable of measuring strains along a standard telecommunication optical cable of up to 50 km long with an accuracy of 10 microstrain. Because of the sensing system's capability of measuring continuous strain profiles and its geometric adaptability in that it can be configured to many shapes, the sensor can be either embedded in the ground in the form of borehole inclinometer, or on the slope surface as ground wire extensometer. An overview of BOTDR/A measuring techniques developed for slope monitoring and earth retaining structure is presented through recent studies reported by various researchers worldwide. This talk critically assesses the suitability of deploying such technology, particularly factors concerning to installation layout, sensor protection, temperature compensation, cost, and data interpretation.

KEYWORDS: Fibre Optic Sensors, Slopes, Retaining Walls, Inclinometer, Strain gauges

SPEAKER'S PROFILE

Ir. Dr. Hisham Mohamad is an Associate Professor at Civil & Environmental Engineering Department, Universiti Teknologi PETRONAS. He holds a PhD degree from University of Cambridge, a Masters degree from Imperial College London, Bachelor degree from Universiti Teknologi Malaysia. Hisham specializes in the area of Geotechnical Engineering and an expert in fibre-optic distributed sensing. Some of his notable involvements of construction monitoring projects using innovative fibre-optic sensing include monitoring tunnel deformation at London King's Cross and Singapore's Mass Rapid Transport (MRT) Circle Line. In 2013, Hisham joined Geotechnics Division, Ministry of Mobility and Public Works in Belgium for a year and was involved in monitoring ground excavation and construction project of the world's largest shipping lock in Antwerp. Hisham is a Professional Engineer registered with Board of Engineers Malaysia and had served as technical committee member in various learned societies locally and abroad. He has published and co-authored over forty technical papers in leading international journals and proceedings. His patented invention of "Smart-Geopipe" was awarded as Best Invention and Gold Awards by Malaysian Road Conference & iENA 2018 and Malaysian Technology Expo 2019.

Ir. Liew Shaw Shong
President
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