Radar Satellite Interferometry (InSAR) instrumentation monitoring in major infrastructure projects

by

Ms Blanca Payas

Date:	Monday, 19 November 2018
Time:	6:30pm Reception
	7:00pm Seminar
Venue:	**LT1**
	Faculty of Engineering
	National University of Singapore

SYNOPSIS

One of the challenges in urban tunneling projects is to guarantee that the infrastructure assets crossing or adjacent to the tunnel alignment and other new build elements are not affected by the construction activity. Radar Satellite Interferometry (InSAR) is a non-invasive surveying technique which provides millimetric deformation measurements of terrain structures over wide areas without any need to access site. This technique allows a comprehensive and periodic vision, with the same accuracy as manual levelling in cities for a fraction of the cost of traditional systems. The evening talk will discuss about the deployment of this technique in the following case studies:

Case 1: Eole railway tunnels projects, Paris, FR
Line E extension of the RER (urban train) network which is 55km to the west, including 8km tunnel from Haussmann Saint-Lazare to Mantes-la-Jolie train stations. 47 km of existing rail lines will be redeveloped and three new stations at Porte Maillot, La Défense-CNIT, and Nanterre-la-Folie. 18,000-square-metre train stations 20 metres underground, just below the city including iconic and sensitive CNIT building were built. InSAR system was deployed for monitoring this critical design is working as predicted with millimetric accuracy.

Case 2: Thames Tideway sewer tunnel project, London, GB
The Thames Tideway Tunnel is an under-construction 25 km tunnel running mostly under the tidal section of the River Thames through central London, which will provide capture, storage and conveyance of almost all the combined raw sewage and rainwater discharges that currently overflow into the river. One part of the project runs under the City of London or under some of the main London Bridges. InSAR provides a continuous source of information from before the start of the project, on how all those surface assets are behaving due to the tunnel excavations providing a platform for the risk of damage, and potentially reducing the cost of the monitoring budget.

Case 3 : Crossrail railway tunnels projects, London, GB

Crossrail is a 118-km railway line under development in London and the home counties of Berkshire, Buckinghamshire and Essex. Its main feature is 21 km of new twin tunnels below the city. These tunnels run from Paddington to Stratford and Canary Wharf in the east. InSAR was pivotal on several steps of the project, from confirming the real Zone of Influence due to the tunnel and station works (dewatering and compensation grouting included), optimising monitoring budget by reducing the active monitoring scope through more traditional techniques, and allowing the client to have a platform of data in order to be able to cover ground and structural behaviour from the beginning of the works until the handover of the completed assets.

THE SPEAKER

Ms Blanca Payas has a Combined scientific-business-academic background with a Degree in Physical Geography (UB-Barcelona), a MSc in Remote Sensing (Dundee-UK) and a Degree in Business Management (ESADE-Barcelona). She has more than 20 years' experience in monitoring and satellite applications in different sectors, such as: Civil Engineering, Oil & Gas, Mining, Natural Hazards & Disaster Risk Reduction. Ms Blanca has joined Sixense Group in Barcelona in 2017 to develop and run the satellite activities of the group worldwide.

LOCATION MAP
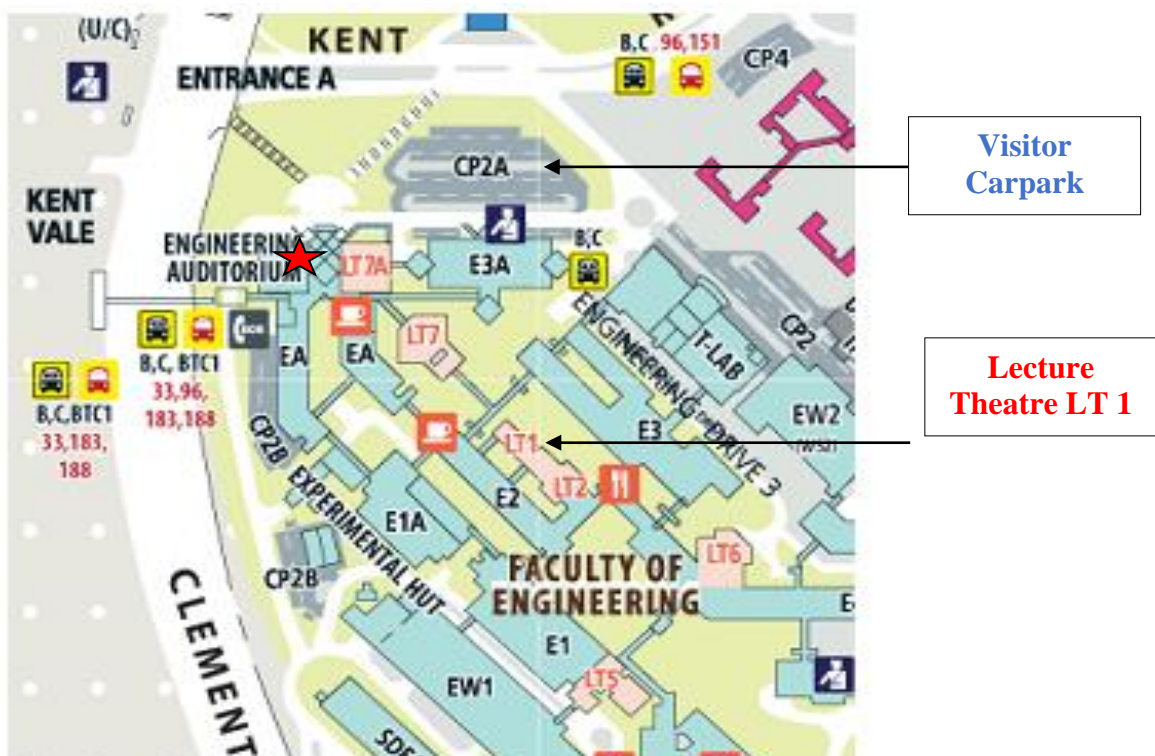
No pre-registration is required.