

Special Session Proposal for 3ECEES

Title: Geotechnical Seismic Isolation (GSI)

Description:

Base isolation is a low-damage seismic design technology that can enhance the resilience of buildings and bridges. Geotechnical seismic isolation (GSI) is an emerging class of base isolation techniques that has attracted global interest in the past decade. It comes to a stage when a more systematic and collaborative global effort is required to take this technology to another level. This is one of the motivations behind this proposal of a special session at the prestigious conference of 3ECEES. There is also an ongoing special issue on GSI in the *Bulletin of Earthquake Engineering*, co-edited by Prof. Hing-Ho Tsang and Prof. Kyriazis Pitilakis.

GSI is comparable with the structural techniques of base isolation, aiming at transmitting less seismic energy to structures. Various reputable groups from all around the world (Europe in particular) have proposed different schemes of GSI based on the use of different materials (e.g. rubber–soil mixture, polyurethane, PVC, etc), which allow decreasing the seismic demand through dynamic soil-structure interaction, rocking or sliding between the structure and the foundation soil or soil improvement. Enabled by the recent advancement of relevant research techniques, such as analytical modelling, laboratory tests (e.g. resonant column, cyclic triaxial or shaking tables tests), or large-scale field testing of dynamic soil-structure interaction (e.g. the EuroSeistest-EuroProteas model structure), it is timely to exchange research ideas and consolidate the development of GSI.

Name and Affiliation of Conveners:

Prof. Eng. Lorella Montrasio PhD, University of Parma, Italy

Prof. Hing-Ho Tsang, PhD, CPEng, Swinburne University of Technology, Melbourne, Australia

Biography of Lorella Montrasio

Lorella Montrasio is a professor in Geotechnical Engineering at the University of Parma (Italy). She has thirty years of experience in soil behaviour, from both static and dynamic points of view. For about 10 years, she has been involved in Geotechnical Earthquake Engineering on the GSI topic based on polyurethane injections, particularly useful for the seismic protection of existing buildings belonging to the historical heritage; for this research theme, she has received both public and private fellowships. The prominent results have been published in reputable journals, as well as proceedings of international conferences. Generally, she has published over 120 journal and conference papers (1138 citations and h-index=16 from Scopus records).

She is an expert member of the Italian Superior Council of Public Works, where she has taken part in the development of the Italian Building Code, as well as several important guidelines for the seismic retrofit of existing buildings, for the preservation of existing bridges and existing tunnels; moreover, she has participated over 70 commissions for the judgment of public projects. She is a member of the Presidency Committee for the Italian Geotechnical Association and Italian representative in the Technical Committees TC 205 (Safety and Serviceability in Geotechnical Design) and TC 208 (Slope Stability in Engineering Practice) of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).

Biography of Hing-Ho Tsang

Hing-Ho is the first who proposed the GSI concept and has published a number of commonly referenced articles on the topic (e.g. 227 citations to the seminal paper he solely authored in 2008, and 35 citations to a recent one published with Kyriazis Pitilakis in 2019). Also, he reviewed many articles on GSI for various reputable journals. He serves as the lead guest editor of a special issue on GSI for the *Bulletin*

of Earthquake Engineering. He has published over 200 research articles including 50 papers in Q1 journals. He is ranked as “Top 1% of Scientists in the World” for Career-long Impact in Civil Engineering, based on the latest “Science-wide Author Databases of Standardized Citation Indicators” developed by Elsevier and Stanford University.

His research works have been recognized by a dozen international awards and university prizes or fellowships. He was a Visiting Professor at Karlsruhe Institute of Technology, Germany, in 2013 and 2016. He also serves in advisory roles to governments, industry and professional bodies, developing seismic design standards and guidelines globally, including Australia, China, Hong Kong and Malaysia. Meanwhile, he is currently the Director (Partnerships) and an Executive of the School of Engineering at Swinburne University of Technology in Melbourne, Australia (world’s top 100 in civil engineering). He convened a network of over 40 earthquake engineering researchers from five universities across the Greater Melbourne region.