

Fourth Lecture by



Prof. Sebastiano Foti

Politecnico di Torino, Italy



1st Webinar Series on GEOTECHNICAL EARTHQUAKE ENGINEERING (November 2021 to October 2022)

Organized under

Prof. Shamsheer Prakash Chair, IIT Roorkee

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Stochastic Analysis of Seismic Ground Response

Date & Time

March 24, 2022

02.30 PM (GMT+5.30)

For more details



<https://iitr.ac.in/geewebinars/>



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Abstract

Ground response analyses (GRAs) represent a key element for the non-ergodic (site-specific) evaluation of the seismic hazard. Definition of input parameters for the numerical models requires an accurate and comprehensive site characterization. In the recent past, several collaborative benchmark exercises have shown the existence of a certain level of “uncompressible uncertainty” in laboratory and in situ tests that need to be considered. Within this context, geostatistical models are helpful in quantifying the influence of such uncertainties. Specifically, as the stratigraphic amplification is strongly sensitive to the shear wave velocity profile, the first part of the webinar will be devoted to present a recent geostatistical model focusing on this parameter. This model provides an efficient and effective tool for the generation of stochastic, but realistic soil profiles. Two applications of the proposed geostatistical model will be then presented. Firstly, an example of site-specific analysis to evaluate the impact of uncertainties in the geotechnical site characterization on the computed seismic hazard, taken from the experience of the microzonation project in central Italy in the aftermaths of the 2016 seismic sequence.

The last section of the webinar will introduce a stochastic database of ground response analyses and its applications: the verification of the new classification scheme proposed in the draft of the second generation of the structural Eurocodes (specifically in Eurocode 8 – part 1); and a systematic comparative analysis between non-linear and equivalent linear approaches.

About the Speaker

Sebastiano Foti is a Professor in Geotechnical Engineering and Vice-Rector for Education at Politecnico di Torino, where he also received his PhD degree. He has been chair for the Civil Engineering program from 2015 to 2018. He is a member of the Technical Committees TC 203: Earthquakes and a past core member of TC 102: In situ tests of ISSMGE. He has been a member of the Project Team for drafting the new version of Eurocode 7 - Geotechnical design - Part 2: Ground investigation and testing.

His research activity is mainly devoted to geophysical methods for geotechnical characterization, with particular reference to surface wave testing, seismic waves in porous media and the use of geophysical techniques in the lab. His other research interests include seismic site response, soil-structure interaction, structural dynamic tests for the assessment of existing foundation systems. He has published over 200 papers in scientific journals and technical conferences, three books and six book chapters. He served in the editorial board of Soils and Foundations from 2015 to 2017.

He was awarded the Geotechnical Research Medal (Bishop Medal) 2003 by the Institution of Civil Engineers (UK) for the best paper on geotechnical engineering, an Honorable Mention in the Best Paper category in the Geophysics journal in 2011 by the Society of Exploration Geophysics (USA) and the Outstanding Paper Award from Earthquake Spectra 2018 by the Earthquake Engineering Research Institute (USA).



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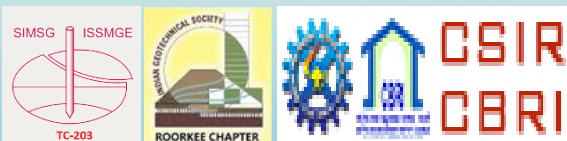
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