



Corso di Dottorato in Ingegneria dei Sistemi Civili  
*Coordinatore del Dottorato: prof. ing. Andrea Papola*

Ciclo di seminari: **Ingegneria geotecnica per la progettazione e la gestione delle infrastrutture**

seminar no.10

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14:30-16:30

Aula Arrigo Croce – ed. C8 – DICEA

**Vulnerability and resilience assessment of road tunnels and bridges  
under Natural Hazards**

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**Abstract:** The rising number of reported incidents involving damage to critical road transportation infrastructure—such as bridges and tunnels—caused by natural hazards has underscored the need for robust methods to assess the vulnerability and resilience of these assets in multi-hazard environments. This lecture will present a brief overview of the research project INFRARES, which focused on developing a comprehensive methodology for assessing the vulnerability and resilience of bridges and tunnels of road networks in Greece subjected to natural hazards. The approach accounts for both the potential ageing of infrastructure components and the effects of soil-structure interaction phenomena. The proposed methodology is applicable to both single-hazard and multi-hazard scenarios, including earthquakes and floods. It introduces innovative fragility functions, making it a valuable tool for thorough pre- and post-event assessments of road bridges and tunnels. Moreover, it supports effective post-event risk management related to the studied hazards.



Dr. Tsinidis is an Assistant Professor in Computational Geotechnical Engineering & Soil-Structure Interaction at the Department of Civil Engineering of the University of Thessaly, Greece, and a member of the Division of Geotechnical and Geo-Environmental Engineering. He holds a PhD in Civil Engineering (2015) from the Aristotle University of Thessaloniki, Greece. His research interests focus on computational geotechnical engineering and soil-structure interaction, with particular emphasis on the response and vulnerability of infrastructure—such as tunnels, underground structures, and bridge foundations—to seismic and other natural hazards. He has published more than 75 articles & papers in international scientific journals and conferences. He has worked as a Civil Engineer / Consultant for consultancies in Vienna, Austria (FCP Fritsch, Chiari & Partner ZT GmbH, Vienna Consulting Engineers ZT GmbH), contributing to a wide range of industrial projects worldwide. Recently, he served as the principal investigator of the research project *INFRARES - Towards resilient transportation infrastructure in a multi-hazard environment*, funded by the Hellenic Foundation for Research & Innovation.

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