

Research Centre Terra, Tampere University

Title: Overview of Terra's research and education

Presenter: Professor Pauli Kolisoja

Biography: Head of the Research Centre Terra and research group TerraRoad operating as a part of it.

Special expertise: traditional and alternative earth construction materials as well as the investigation of their properties; performance, design, modelling, maintenance and remediation of infrastructures; monitoring of the performance of full-scale infrastructures.

<https://www.tuni.fi/en/pauli-kolisoja>

Photo:



Title: AI-aided CPTu interpretation in determination of soil stratification

Abstract: He presents CPTu-based stratification-characterization model, -IGTOSS, comprising of AI models and soil behavior type characterization charts. This field of study aligns well with years of his working experience in several near-shore, roadway, and constructions projects, which he embarked on following his Master's.

Presenter: Mohammad Sadegh Farhadi

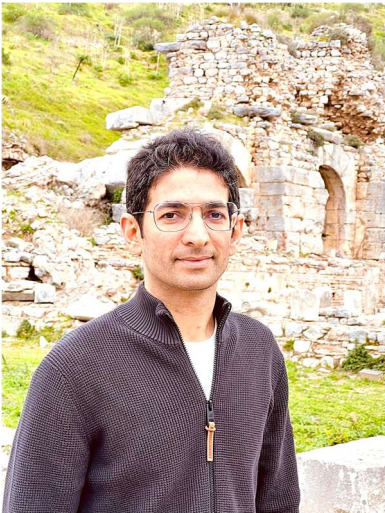
Biography: Mohammad Sadegh Farhadi, a member of the Geo group of the TERRA Research Center, at Tampere University, is currently doing his doctoral studies on the interpretation of Cone Penetration Testing (CPTu), a continuously-measuring geotechnical test that provides invaluable insights into soil properties. Herein, he presents their proposed CPTu-based stratification-characterization model, -IGTOSS, comprising of AI models and soil behavior type characterization charts. This field of study aligns well with years of his working experience in several near-shore, roadway, and constructions projects, which he embarked on following his Master's.

His research interests are inter-disciplinary, spanning from the micro- and macro-scale studies of clays and silts to AI and FEM programming, image processing, and soil improvement. This multi-

disciplinary approach allows him to tackle complex problems from multiple angles of view, fostering innovation and breakthroughs in his field. Their contributions have been showcased in various international conferences and technical journals, reflecting their collaborations on a global scale.

Beyond academia, Mohammad tries to lead a balanced life, enjoying a variety of **leisure activities**. Whether it's ice skating, playing chess, playing futsal, working out at the gym, playing 8-ball pool, attending art museums, or watching movies. He likes teaching, learning from nature and making conversations with people.

Photo:



***Title:* Reducing the lead times of street construction sites**

Abstract:

Presenter: Maiju Örmä

Biography: <https://www.researchgate.net/profile/Maiju-Oermae>

Photo:

***Title:* Modeling functionality of railway structures under increasing train loads**

Abstract: In a recent study at Tampere University's Research Center Terra, a new type of calculation model has been developed to examine the effects of increasing driving speeds and axle weights on the dynamic loading behavior of railway structures. This model combines a multibody dynamics-based vehicle model with a non-linear track model. To simulate the long-term loading behavior of different railway structures, separate damage models have also been developed to calculate permanent deformations in the structural layers. In the presentation, the main features of the model are discussed briefly, and the functionality of the model is demonstrated through some case examples.

Presenter: Marko Peltomäki

Biography: Currently, I am working as a doctoral researcher at Tampere University's Research Center Terra. My research primarily focuses on computational modeling of loading behavior in road and railway structures, employing various numerical and analytical methods. In particular, the deformation and damage behavior of traffic infrastructures is a central aspect of my research.

Photo:

