

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT of
CIVIL AND ENVIRONMENTAL ENGINEERING

**" Recent developments in experimental
micromechanics for geomechanics applications "**

by

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Abstract

Recent developments in discrete element modeling (DEM) have enhanced our knowledge on the behavior of granular materials including soils, which are complex in nature. This complexity is partly attributed to the interactions of grains at their contacts. However, there has been less progress in experimental methods to measure different micro-quantities at the scale of a grain, particularly quantifying, friction, stiffness and grain surface damage, which would lead to a better understanding of the fundamental micro-mechanisms that control the macro-scale behavior of geo-materials. This would advance our numerical simulations providing realistic input to be used by DEM modelers, therefore improving our predictive models for the safer design and assessment of important infrastructures. In this presentation, recent developments in micromechanical experimental methods will be presented and discussed with a focus on the performance of a new generation apparatus developed at the City University of Hong Kong which is capable of measuring micro-quantities of real soil grain contacts. Applications to real engineering problems will be discussed and a strong link between micro-scale testing results and macro-scale behavior of soils under dynamic loads will be presented enhanced from recent research studies by the presenter.

Biography

Dr. Senetakis joined City University of Hong Kong in December 2016 as an Assistant Professor. Prior to his new appointment, he worked for two years as a Post-Doctoral Research Fellow at City University of Hong Kong (2011-2013) and three years as a Lecturer at Thammasat University in Bangkok Thailand (2013-2014) and UNSW in Sydney Australia (2014-2016). He holds a Diploma in Civil Engineering and he completed his MSc in Earthquake Engineering and Structural Dynamics in 2006 and PhD in Soil Dynamics in 2011 at the University of Thessaloniki Greece. Dr Senetakis research interests focus in the fields of experimental soil dynamics, micromechanics, geo-synthetics and recycled aggregates in geotechnics. Dr Senetakis worked for about five years as a consultant engineer in earthquake and geotechnical engineering projects and currently he is in charge of the Soil Mechanics Laboratory of the City University of Hong Kong which is one of the most well-equipped laboratories for advanced element and micro-mechanical testing for soils and weak rocks.

ALL ARE WELCOME!