Department of Civil Engineering and Engineering Mechanics

Columbia University

Visualizing Soil Structure Interaction and Flow, Non-Intrusively

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644 Mudd

Measurement of three-dimensional deformation patterns and flow characteristics within a soil continuum are usually limited by the fact that soil sensors do not provide a continuous image of the measured continuum. Additionally, soil sensors exhibit static and dynamic characteristics that are different from those of the surrounding soils and therefore can change the response of the measured continuum. This seminar presents a novel physical-modeling methods to study flow and soil-structure problems. The method employs transparent synthetic soils that represent the macroscopic behavior of natural soils. Digital image correlation (DIC, also known as particle image velocimetry (PIV)) techniques are employed to quantify the meso-scale response of granular soils to high-speed penetration, non-intrusively. Advances in individual particle tracking and imaging of micro-scale phenomena are also introduced.

Magued Iskander, PhD, PE, F.ASCE is Professor of Geotechnical Engineering and Chair of the Civil and Urban Engineering Department at New York University Polytechnic School of Engineering (formerly Polytechnic University and Polytechnic Institute of NYU). He is widely recognized as the leading authority on modeling geotechnical applications with transparent soils. Professor Iskander has served as Principal Investigator (PI) and Co-PI on over $12 million of research and educational grants and contracts. He has authored four books, edited 10 books, and published over 150 papers dealing with penetration mechanics, experimental modeling, foundation engineering, pedagogy, and urban geotechnology. He has graduated over 30 doctoral and masters students.

Host: Prof. Hoe Ling