

Civil and Environmental Engineering Graduate Seminar Series

Mechanics of Granular Materials at Particle Scale



Presented by Khalid A. Alshibli, Ph.D., P.E.

Strength properties and deformation characteristics of uncemented granular materials are to a large extent derived from the fabric or geometry of the grain structure and inter-particle interaction. Synchrotron Computed Tomography (SMT) and 3D X-ray Diffraction (3DXRD) techniques were used to investigate particle-to-particle interaction, and fracture behavior of silica sand at the particle level. Under 1D compression, researchers observed that particles initially translate and rotate which lead to more contacts between particles and the development of force chains to resist applied loads. Particles within force chains resist most of the applied loads while neighbor particles provide lateral support to prevent particles with force chains from buckling. Several experimental and numerical models have been proposed in the literature to characterize force chains within granular materials. The presentation will focus on kinematics, fracture behavior, and force transmission in sand using experiments and finite element modeling.

Associate Department Head of Graduate Studies and Professor of the Dept. of Civil and Environmental Engineering, University of Tennessee-Knoxville (UTK)

**Monday, Oct. 29, 2018 at 3:30 p.m.
Prescott Hall, room 215**

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