



**UAA College of Engineering**  
UNIVERSITY of ALASKA ANCHORAGE

## UAA Professional Development Seminar Series

### **A New Triaxial Test System to Characterize Behavior of Unsaturated Soils**

Presented by Professor Lin Li

Suction-controlled triaxial tests have been widely used to characterize unsaturated soils. However, this type of test requires sophisticated, expensive equipment, and is very time-consuming due to the low permeability of unsaturated soils. Very few research universities can afford the equipment, limiting the advancement and implementation of unsaturated soil mechanics.

A new triaxial testing system for unsaturated soils, based on minor modifications to the conventional triaxial test apparatus

for saturated soils is proposed. Instead of controlling suction, high-suction tensiometers are adopted to monitor matric suction variations during constant water content triaxial testing. A photogrammetry-based method has been developed to measure volume changes of unsaturated soil specimens during triaxial testing. A series of constant water content triaxial tests were performed on unsaturated soils with different moisture contents, and matric suction and volume variations during testing were monitored by both the high-suction tensiometers and the photogrammetry-based method. The photogrammetry-based method provided high accuracy, showing that the proposed triaxial system is cost-effective and efficient for unsaturated soil characterization.

Lin Li, Ph.D., is an assistant professor at UAA's College of Engineering. He obtained his Bachelor's degree in Highway Engineering and his Master's degree in Civil Engineering at Chang'an University in Xi'an, China, with a research focus on Highway and Railway Engineering. He extended his research into cold-region paving materials, slope protection, and unsaturated soil mechanics at the University of Alaska Fairbanks (UAF) and received both a second Master's degree and a Ph.D.

**Friday, November 10, 2017**

**11:45 am - 12:45 pm**

**UAA Engineering & Industry Building, Room 211**