

# Unsaturated Soil Mechanics

## Advanced Methods to Characterize Soil Behavior

- Close-range photogrammetry and its applications in geotechnical engineering
- High suction tensiometer and automated laboratory measurements
- Characterization of coupled thermo-, chemo-, hydro-, mechanical behavior of multiphase geomaterials

## Constitutive and Numerical Modelling of Unsaturated Soils

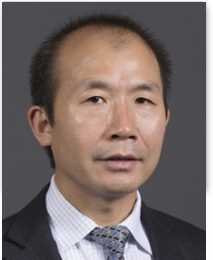
- Modified state surface approach for constitutive modelling of multiphase materials
- Numerical modelling of climate-vegetation-soil-structure interaction
- Slope stability and retaining walls

## Other Topics

- Frozen ground engineering
- Use of wicking fabric to mitigate frost heave and thaw weakening

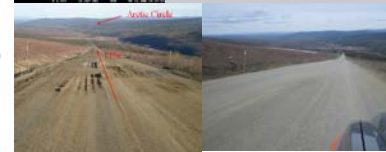
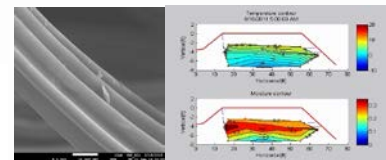
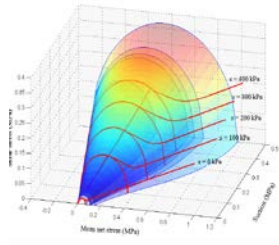
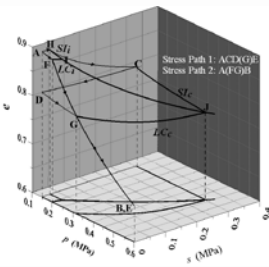
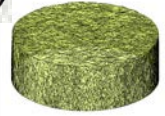
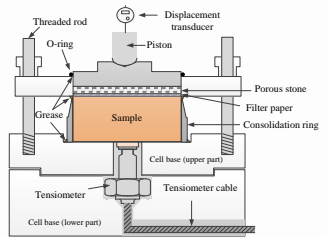
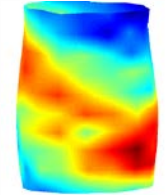
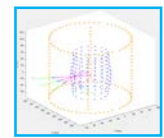
PoC: Ground improvement and erosion control

**Xiong Zhang**, Ph. D., P. E. Associate Professor  
zhangxi@mst.edu, 573 341-6286



## Funding

- National Science Foundation
- US Department of Transportation
- Alaska DOT&PF, AUTC, CESTiCC
- TenCate Geosynthetics



## Close-Range Photogrammetry and Characterization of Geomaterials, Constitutive Modelling of Multiphase Materials, Frozen Ground Engineering

### Keywords

- Photogrammetry, Image Processing, Unsaturated Soils, Constitutive Modelling, Modified State Surface Approach, Slope Stability, Landslides, Ground Improvement, Slab on Expansive Soils, Wicking Fabric, Frost Heave Mitigation

### Recognitions

- International Innovation Award in Unsaturated Soil Mechanics, ISSMFE
- Excellent reviewer, Canadian Geotechnical Journal