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THE UNIVERSITY OF WARWICK

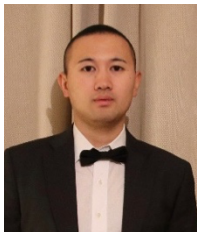
Civil Engineering Research Group

Invitation to Seminar

- **Creep testing of soil-geocomposite interfaces during drying-wetting cycle**

In order to study the creeping behavior of soil-geocomposite drain interfaces during drying-wetting cycle, a stress-controlled direct shear apparatus that can conduct creep tests on soil-geosynthetics interfaces during drying-wetting cycle is developed. The shear creeping deformation of Mercia Mud-geocomposite drain interfaces during repeated drying-wetting cycle under different shear stress levels was measured by the developed apparatus. The results indicate that, the developed stress-controlled direct shear apparatus can conduct creep tests on soil-geosynthetics interfaces during drying-wetting cycle. The interfaces under 90% and 80% shear stress levels fail during the first drying cycle, while for the interfaces under 70%, 60% and 50% shear stress, they do not fail during the repeated drying-wetting cycle. The impacts of drying cycle on the horizontal displacement are significantly larger than that of wetting cycle. Additionally, it was found that the impact of drying cycle on the horizontal displacement of the interfaces under higher shear stress level is larger than that of the interfaces under lower shear stress level.

Patrick Chao PhD student, Civil Engineering, University of Warwick

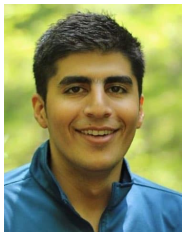


Patrick obtained his Bachelor and Master degrees from Shenyang Jianzhu University and Hohai University, respectively. He was a Ph.D student in School of Engineering of the University of Warwick (start 2017). He has submitted his PhD thesis and awaits for his Viva Voce examination. His research project, on geosynthetics and soil-geosynthetics interface interactions, was supervised by Dr Gary Fowmes.

- **Computational modelling of fluid-driven fracture propagation in brittle porous rocks**

Hydraulic fracturing or “Fracking” is one of the widely used techniques for recover of geo-energy by enhancing the permeability of subsurface reservoirs. However, its reputation has been scathed mostly because of leakage of fossil fuels into groundwater resources and possibilities of occurring other types of contamination. Therefore, it is of great importance to study hydro-mechanical behavior of reservoirs during the propagating of hydro-fractures. In this talk, Nima presents a computational modelling framework that is capable to predict the propagation path of the fluid-driven fractures in underground formations considering the nonlinear behavior of saturated porous media. The method employed to model fracture propagation is on the basis of the continuum phase-field theory which has been demonstrated to be computationally efficient for modelling the discontinuities. It has been resulted that the flow regime in the porous media can be affected significantly by the formation of crack, and the far-field stresses and material properties are the main factors in specifying the orientation of cracking in the porous media.

Nima Sarmadi PhD student, Civil Engineering, University of Warwick



Nima has received his BSc degree from Tehran Polytechnic University in 2017 and obtained his MSc with distinction from the University of Tehran in 2019. His research interests are mainly in the field of geotechnical engineering, including geomechanics, seismic response analysis, fracture mechanics, and flow in porous media. He started his PhD at the University of Warwick in January 2020 and is currently doing research in PMPM research group under the supervision of Dr. Mohad M. Nezhad.

Wednesday 24 February 2021, 12.00pm-1:00pm
Online (via Teams)

The seminar is open to all.
For more information, contact Dr Rezania (m.rezania@warwick.ac.uk).