He Zhang – ITASCA Minneapolis

Geomechanics Engineer

Expertise Rock Cutting, Numerical Modeling, Drilling Mechanics, Nonlinear Vibration

Education

Ph.D. (Engineering Mechanics), 2019
Shanghai University, Shanghai, China

M.Sc. (Engineering Mechanics), 2015
Shanghai University, Shanghai, China

B.E. (Engineering Mechanics), 2013
China Jiliang University, Hangzhou, Zhejiang, China

Professional Experience

2025 – Present	ITASCA Minneapolis, Minnesota Geomechanics Engineer
2022 – 2025	Halliburton, Center of Excellence, Singapore Senior Scientist - Physics
2020 – 2022	University of Minnesota, Dept. of Civil, Environmental, & Geo-Engineering, Minneapolis, Minnesota Postdoctoral fellow
2019 – 2020	University of Texas at Austin, Dept. of Petroleum and Geosystems Engineering, Austin, Texas Postdoctoral fellow

Project Experience

Numerical Model Development for Leach Pile Stability Analysis: Developing a three-dimensional model used for numerical simulation of leach pile stability analysis with the objective of applying the model to prevent fluid-flow induced slope instability.

Scratch Testing on Rock: Use laboratory device, WOMBAT, to shear a thin layer of the free surface of rock samples by imposing constant velocity and depth of cut on a single PDC cutter. The signals of the force acting on the cutter were analyzed to characterize the rock strength properties, such as unconfined compressive strength and heterogeneity. The rock failure mechanism in the cutting process was investigated, showing the transition of the rock failure from shear to tensile cracks as the depth of cut increases. The appearance of the tensile cracks is associated with a crushed zone, where the rock was pulverized into powders to form a wedge. The relationship between the cutting energy and the particle size distribution of the resulting rock particles was studied to show that the dominance of the cutting energy was dissipated to create the fine rock particles in a ductile manner.