# *Pengju Xing*

ITASCA Consulting Group, Inc
An Itasca International Company

## Geomechanics Engineer

***Expertise***

Rock mechanics, Enhanced Geothermal System, computational mechanics, experimental rock mechanics, hydraulic fracturing, fracture mechanics, machine learning

***Education***

Ph.D. (Major: Civil Engineering, Minor: Mechanical Engineering), 2017
University of Pittsburgh, Pittsburgh, Pennsylvania, USA

M.Sc. (Structural Engineering), 2012
Tongji University, Shanghai, China

B.Eng. (Civil Engineering), 2009
Wuhan University, Wuhan, Hubei, China

***Professional Affiliations***

American Rock Mechanics Association (ARMA)

Geothermal Rising (GR)

Society of Petroleum Engineers (SPE)

Society of Exploration Geophysicists (SEG)

***Professional Experience***

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| *2022 – Present* | *Itasca Consulting Group, Inc., Minneapolis, Minnesota*<br>*Geomechanics Engineer* |
| *2019 – 2022* | *University of Utah, Energy & Geoscience Institute, Salt Lake City, Utah*<br>*Postdoctoral Researcher* |
| *2018 – 2019* | *WD Von Gonten Laboratories, Houston, Texas*<br>*Geomechanics Engineer* |
| *2016 – 2016* | *ANSYS, Inc., Canonsburg, Pennsylvania*<br>*Test Engineer (Intern)* |

***Project Experience***

*Numerical Modeling of the Stimulation for Enhanced Geothermal Systems (EGS)*: Simulate the stimulation of an EGS reservoir with a fully coupled hydro-mechanical model (Itasca's *XSite*). Around 10,000 natural fractures are explicitly represented in the model. The model has been calibrated with the DFIT data obtained at the field.

*In-situ Stress Measurements for Geothermal and Oil/Gas Reservoirs*: Extensive investigation of in-situ stress measurements with various methods. A new method based on temperature signature was first proposed, and it has strong and unambiguous signals compared to traditional methods such as G-function analysis. Other alternative tests, pump-in/flowback tests, were designed and conducted at field, which can greatly reduce the time for fracture closure.

*Machine Learning Models to Predict Formation Properties Using Drilling Data*: Drilling data reflects the bit-rock interaction, and thus can be used to evaluate the rock strength. Various machine learning models, such as random forest, artificial neural network, and multi-variate regression, were used to predict the rock compressive strength. The model was trained by rock strength obtained through sonic logs and lab core tests.

*Core Analysis for Unconventional Oil/Gas Reservoirs*: Conduct triaxial compression tests, Brazilian tests, shear tests, and permeability tests for cores. The information is incorporated into a simulator to provide hydraulic stimulation design optimization and reservoir analysis for clients.

*Numerical Modeling and Experimental Investigation of Hydraulic Fracturing Growth in Layered Reservoirs:* Design, develop, and execute experiments on hydraulic fracture growth. Numerical simulation of the experiments used Itasca's *XSite*. The research results have been used in waterflooding at Chevron. First laboratory demonstration for 1/3 asymptotic solution for PKN model. Hydraulic fracture simulation with cohesive zone method.

*Thermal-Hydrological-Mechanical Analysis in Hydrate Bearing Sediments:* Development of FEM code coupled with TOUGH+HYDRATE for Thermal-hydrological mechanical analysis in hydrate bearing sediments. Developed finite element code including both displacement and pore pressure. Developed finite element code capable for nonlinear material such as Mohr-Coulomb and Cam-Clay soil.

*Structural Design for Offices, Schools, and Railway Stations:* Using AUTOCAD, PKPM, ANSYS, etc., to design, calculate, and plot construction drawings for the building structures.

*Numerical Analysis of Stability Capacity of Cable-Stiffened Single-Layer Latticed Shell:* Analysis of the structural features of different types of cable-stiffened single-layer latticed shells. Numerical study of the impact of semi-rigid joints on the overall stability of the new structure style.