

Vibhav Bisht

Geomechanics Software Engineer

Expertise Numerical Modeling, Software Development, Soil Mechanics, Plasticity

Education Ph.D. (Civil Engineering, concentration Computational Science), 2021
M.Sc. (Civil Engineering), 2017
Purdue University, West Lafayette, Indiana
B.Tech. (Civil Engineering), 2014
Indian Institute of Technology Delhi, New Delhi, India

Honors Gerald & Beryl Leonards Fellowship (2015–2018, 2019–2021)

Professional Experience

2021 – Present *Itasca Consulting Group, Minneapolis, Minnesota*
Geomechanics Software Engineer

2014 – 2021 *Purdue University, Civil Engineering, West Lafayette, Indiana*
Research Assistant

Project Experience

Numerical Analysis of Cone Penetration: Developed algorithms in the Material Point Method (MPM) to simulate cone penetration in Ottawa Sand and Boston Blue Clay. Used advanced bounding surface models for realistically capturing soil behavior. Proposed an anti-locking algorithm to simulate soil at critical state. Developed a coupled formulation for modeling the hydro-mechanical response of soil. Demonstrated that accurate cone resistances can be obtained from MPM by comparison against field tests and calibration chamber experiments. Additionally, validated displacement fields computed using MPM by comparison against displacement fields measured in a calibration chamber using digital imaging.

Pile Driving: Developed a pile driving software capable of predicting first-estimates of axial pile capacity in real time. Developed signal matching algorithms for accurately predicting pile capacity and used the algorithms for predicting axial capacity of large diameter open-ended pipe piles driven in clay. Proposed design equations for estimating driven pipe pile capacity and validated design equations against several case histories.