

Matthew Purvance

Senior Software Engineer

Expertise Scientific Computing and Software Design/Implementation, Numerical Modeling of Earthquake Ruptures, Seismic Hazard Analysis

Education Ph. D. (Geophysics), 2005
B.Sc. (Mathematics), 2000
University of Nevada, Reno, Nevada

Professional Experience

	<i>Itasca Consulting Group, Inc., Minneapolis, Minnesota</i>
<i>2013 – Present</i>	<i>Senior Software Engineer</i>
<i>2008 – 2013</i>	<i>Software Engineer</i>
	<i>University of Nevada, Reno</i>
<i>2009</i>	<i>Letter of Appointment</i>
<i>2007 – 2009</i>	<i>Assistant Research Professor</i>
<i>2005 – 2007</i>	<i>Postdoctoral Scholar</i>

Project Experience

Design/implementation of efficient spatial searching in the Itasca framework, design/implementation of triangular faceted wall module for *PFC5.0*, design/implementation of discrete fracture network module for *PFC 5.0*, design/implementation of lattice module for *PFC 5.0*, implementation of fluid flow logic in Itasca hydraulic fracturing simulator, simulation of dynamic ruptures along using interfaces using the *Particle Flow Code (PFC)*, study of percolation of fines through granular assemblages using the *Particle Flow Code* in 3D (*PFC3D*), fragility estimation for fragile geological features using the *Universal Distinct Element Code (UDEEC)*.

Research

Efficient numerical methods for the simulation of discrete physical systems, efficient spatial searching methodologies, framework software design, coupling of discrete/continuum numerical modeling techniques, interface dynamics, theoretical contact mechanics, computational representations and methodologies in contact mechanics, cellular automata models of elastic materials (e.g., wave propagation, fracture, spalling, etc.), micromechanical modeling of complex materials, elastic lattice modeling, earthquake source physics, seismic hazard analysis.