

---

## Geotechnical Engineering

<b>Expertise</b>	Geotechnical Earthquake Engineering, Soil Dynamics, Numerical Methods in Geotechnical Engineering, Soil Structure Interaction, Constitutive Modeling
<b>Education</b>	Ph.D. (Civil Engineering, Geosystems), 2010 M.S. (Civil Engineering, Geosystems), 2006 Georgia Institute of Technology, Atlanta, Georgia  B. Tech. (Civil Engineering), 2005 Indian Institute of Technology Delhi, New Delhi, India
<b>Honors</b>	Distinguished Ph.D. Student in Geosystems, George F. Sowers Award, Georgia Tech (2010)  Outstanding M.S. Student in Geosystems, James S. Lai Award, Georgia Tech (2007)  Best Undergraduate CEE Thesis, Preamsheel Bhatnagar Award, IIT Delhi (2005)  Best All Round CEE performance, Dogra Gold Medal, IIT Delhi (2005)  Second Best All Round Institute performance, Alok Saxena Award, IIT Delhi (2005)  Merit Scholarship, IIT Delhi (2004-2005)
<b>Professional Affiliations</b>	Member: American Society of Civil Engineers (ASCE), Geo-Institute (G-I), Earthquake Engineering Research Institute (EERI), George E. Brown Network for Earthquake Engineering Simulations (NEES).
<b>Professional Experience</b>	
2010 - Present	<i>Itasca Consulting Group, Inc., Minneapolis, Minnesota</i> <i>Geomechanics Project Engineer</i>  <i>Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta</i>
2010	<i>Course Instructor</i>
2007-2009	<i>Teaching Assistant</i>
2005 – 2010	<i>Graduate Research Assistant</i>
2005	<i>IIT Delhi, Dept. of Civil Engineering, Delhi, India</i> <i>Junior Research Fellow</i>
2004	<i>Larsen and Toubro, Delhi, India</i> <i>Engineering Intern</i>
2003	<i>Delhi Metro Railway Corporation, Delhi, India</i> <i>Engineering Intern</i>

***Project Experience***

*Seismic Risk Reduction for Port Systems:* As part of NSF Grand Challenge team, developed simplified models to simulate pile response in both liquefiable and non-liquefiable soils at much faster speed and minimal loss of accuracy. The reduced complexity and computational time allows numerical simulation of multiple hazard scenarios, both soil- and structural-remediation options and variation in soil properties. The results are used to develop fragility curves and perform cost-benefit analyses to select optimal remediation strategies. The model has broad range of application and also benefits state-of-the-art in foundation design in liquefiable soils. Also developed a hysteresis model for coupling in both horizontal directions during lateral loading of piles.

*Dynamic Response of Caisson Foundations:* Studied the response of caisson foundations using numerical analyses for small-strain cyclic loading. Developed and calibrated Winkler spring models to capture different soil resistance mechanisms. Analyses revealed range of loading frequency where destructive interference of wave fields prevents transmission of energy away from the foundation. Also developed transfer functions for response to seismic loading. The proposed model was shown to capture foundation response more accurately than the existing approach for either shallow or deep foundations.

*Seismic Risk Analyses:* Worked on seismic risk estimation for New Delhi region using synthetic ground-motion generation and site-response analyses. Also used synthetic ground motions and numerical analyses to estimate the damage to wharf structures during the 2001 Bhuj earthquake.