



RESEARCH SEMINAR

Predictive geomechanics for regional-scale landslide hazard assessment

SPEAKER Prof. Giuseppe Buscarnera

MODERATOR Dr. Clarence E. Choi

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ABSTRACT Prediction has always played a crucial role in all aspects of human life. The science of prediction is also at the heart of infrastructure design and risk management, in that decisions of social relevance must rely on a sound understanding of how engineered and natural systems respond to environmental stressors. This talk explores the use of geomechanical models for predicting the type, magnitude, and rate of damaging ground movements associated with rainfall-induced landslides. Emphasis is given to events displaying sharp acceleration, and thus able to pose threats to life. First, it is shown how the fundamental principles of unsaturated soil mechanics can be integrated with concepts of material stability to derive multi-modal safety factors distinguishing slips of limited mobility from liquefaction-driven flow slides. It is shown how these tools can be employed to map time-varying landslide hazards across heterogeneous landscapes during intense storms. Then, the framework is



ABOUT THE SPEAKER

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Giuseppe Buscarnera is Associate Professor of Geotechnical Engineering at Northwestern University, which he joined in September 2011. He received his M.S. in Civil Engineering from the Politecnico di Milano and his Ph.D. in Geomechanics from the Politecnico di Torino. During his doctoral and post-doctoral studies he has collaborated with several academic institutions around the world, such as the Universitat Politècnica de Catalunya, the Massachusetts Institute of Technology, and The University of Sydney. Dr. Buscarnera's research focuses on the area of geomechanics, and in particular on material stability, constitutive modeling for soils and rocks, multi-physics of porous media, granular materials, and the application of geomechanics to geohazard assessment and subsurface technology. He is serving as the PI of various sponsored research projects on these topics and his research has been awarded with the Faculty Early Career Development Award (CAREER) from the National Science Foundation and the ASCE Arthur Casagrande award.