

# Regional Hazard Risk Assessment through High-Performance Computing, Computer Vision, and Machine Learning

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## Abstract:

There is a perfect convergence of key tools and technologies that are now enabling civil engineers to assess risk and resilience at the system level, which will illuminate the true hazard exposure in unprecedented ways. In this talk, I will provide a summary of various workflows that our research group has generated for regional seismic risk and loss assessment for various hazards. These workflows feature building and bridge inventories generated using expert systems, computer vision, machine learning algorithms, and tools for automated generation of fragility functions.

## Bio:



Ertugrul Taciroglu earned a B.S. degree in 1993 from Istanbul Technical University, and M.S. and Ph.D. degrees from the University of Illinois at Urbana-Champaign (UIUC) in 1995, and 1998, respectively. After a stint at the Center for Simulation of Advanced Rockets (UIUC) as a postdoctoral research associate, he joined the Civil & Environmental Engineering Department at UCLA in 2001 where he is currently the department chair. His research interests span the disciplines of theoretical & applied mechanics, and structural & geotechnical earthquake engineering. He is conducting projects on regional performance-based risk assessment of civil infrastructure, structural health and performance monitoring, soil-structure interaction, and simulation of structural response under extreme loads. Dr. Taciroglu is the recipient of a 2006 National Science Foundation CAREER award, and the 2011 Walter Huber Prize of the American Society of Civil Engineers (ASCE). He was elected to become a Fellow of the ASCE Engineering Mechanics Institute (EMI) in 2015, and serves on the EMI Board of Governors. He serves on the editorial board of several journals, including ASCE Journal of Structural Engineering, EERI Earthquake Spectra, Soil Dynamics & Earthquake Engineering, and Structural Control & Health Monitoring. He is the inaugural editor-in-chief of ASCE Open: Multidisciplinary Journal of Civil Engineering.

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1017 Hydro Building