Multi-Disciplinary Seismic Resilience Modeling and Community Engagement for Developing Mitigation Policies

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Abstract: Earthquake disasters, as observed in recent events in Turkey, Japan, and Taiwan, have underscored the pressing need for a comprehensive resilience assessment and planning for infrastructure and community systems. This necessitates advanced data-driven and computational modeling techniques and a shift towards multi-disciplinary seismic resilience modeling, which is instrumental for formulating effective mitigation policies. The backbone of this modeling approach is multi-disciplinary data collected at the community level, which enables and informs decisions for mitigation and recovery planning. This presentation introduces a framework that links engineering models with socio-economic models to assess the seismic vulnerability and resilience of built environment and social and economic systems, thereby providing invaluable insights and metrics for decision-makers. These metrics are pivotal in developing effective mitigation policies and enhancing the resilience of communities. The approach is illustrated using real-world case studies of US communities, including Salt Lake County (SLC), Utah, developed through extensive collaborative engagement with SLC officials.

Biography: Dr. Milad Roohi is an Assistant Professor at the Charles W. Durham School of Architectural Engineering and Construction at the University of Nebraska-Lincoln (UNL). He is also the director of the Smart Resilient Infrastructure and Urban Systems (SiRIUS) lab. The lab's research aims to enhance infrastructure and community resilience through multi-disciplinary data, computational models, and emerging technologies. Before joining UNL, Dr. Roohi served as a Senior Scientist at Aon in the Impact Forecasting R&D Center of Excellence, specializing in seismic catastrophe risk modeling for the US and Caribbean region. Dr. Roohi completed his Postdoctoral Fellowship at the NIST Center for Risk-Based Community Resilience Planning, headquartered at Colorado State University. He received his Ph.D. in Civil Engineering from the University of Vermont, with a focus on seismic structural health monitoring of instrumented buildings. His research has been published in leading civil and structural engineering journals and conferences, and he is actively serving several national and international technical committees.