Multi-Hazard Resilient Transportation Infrastructure: Advances, Opportunities, and Role in Supporting Community Resilience

Friday, November 15 at 4pm
Room 303, Whitaker Lab, Lehigh University
5 E Packer Ave, Bethlehem, PA 18015

Infrastructure systems, such as various modes of transportation, are exposed to an array of threats throughout their life-time, including both chronic and acute stressors that pose a risk of damage and cascading consequences to community systems. These stressors include aging and deterioration, increased demand by a growing population, and natural hazards that may become more frequent with climate change. This presentation poses multi-hazard risk and resilience assessment frameworks for transportation infrastructure, including highway and railway networks, exposed to earthquakes, hurricanes and flooding events. Along with key input models and enabling tools, this presentation probes the potential for damage, impact of mitigation, and cascading social, environmental and economic consequences. Leveraging case study examples with transportation infrastructure, this talk will explore recent advances, challenges and opportunities with respect to resilience modeling of infrastructure portfolios and distributed systems. Furthermore, the role of transportation infrastructure in supporting broader community resilience and sustainability pursuits is explored.

Dr. Padgett’s research focuses on the application of probabilistic methods for risk assessment of infrastructure, including the subsequent quantification of resilience and sustainability. Her work emphasizes structural portfolios and distributed systems exposed to multiple hazards, including earthquakes, hurricanes, or aging and deterioration. She has published over 200 articles in journals or archived conference proceedings in the general area of structural response, reliability and life-cycle assessment. Dr. Padgett was the founding Chair of the ASCE/SEI technical committee on Multiple Hazard Mitigation, and is an active member of several national technical committees within ASCE and SEI. She currently serves on editorial boards for the ASCE Journal of Structural Engineering, Natural Hazards Review, and Sustainable and Resilient Infrastructure. Dr. Padgett has received several awards and recognitions including the 2017 ASCE Walter L. Huber Civil Engineering Research Prize, and the 2017 (T+R)2 Award at Rice University for excellence in research and teaching. She also was awarded the 2011 National Science Foundation Faculty Early Career Development (CAREER) Award and the 2016 IALCCE Junior Award for “contributions to life-cycle analysis of structures”. Among other projects, Dr. Padgett currently serves in leadership roles within several large national and regional research efforts including the NIST Center of Excellence for Community Disaster Resilience, the NSF NHERI Cyberinfrastructure “DesignSafe-CI”, and the Severe Storm Prediction Education and Evacuation from Disasters (SSPEED) Center.

The event is organized by Dr. Paolo Bocchini, on behalf of the ASCE EMI Objective Resilience Committee. For additional information, contact paolo.bocchini@lehigh.edu