Title: Data-driven and Model-based Analysis for Intelligent Infrastructure: Two Case Studies

Friday, 2/23/18 | 12-1pm | West Hall, W105
Speaker: Dr. Liang Cheng

Abstract: In this talk, I will provide two case studies of data-driven and model-based approaches to enabling intelligent infrastructure. One is how to analyze cyber-physical systems affected by random processes against deterministic performance requirements using power substation automation systems as an example. The research was initiated from discussions with industry collaborators when they were helping their customers to modernize substation automation systems for smart grid applications by adopting international standard IEC (International Electro-technical Commission) 61850. The other is how to realize temporally and spatially continuous underground sensing, a research project sponsored by the NSF (National Science Foundation). The research was developed with a vision of proactive maintenance for embankments to fight flooding, for targeted instrumentation of pipelines to avoid leakage-induced disasters, and for continuous checking of fuel tank surroundings to prevent serious pollution.

Bio: Prof. Liang Cheng from Lehigh University focuses his research on enabling intelligent infrastructure based on real-time sensing and model-driven data analytics through interdisciplinary projects, such as cyber security and smart grid (DOE and PITA projects), infrastructure monitoring (NSF and PITA projects), and IoT middleware (an NSF project seeded by his work on networked appliances in 2000). He is also an expert in ad hoc networks (NSF, DARPA and PITA projects). His research has also been funded by industry partners such as ABB, Agere Systems, East Penn Manufacturing, and PPL. He has advised 6 Ph.D. students to their graduation, supervised 2 postdocs, advised 22 Master's degree theses, and co-authored more than 100 papers. He is a keynote speaker at 2015 IEEE International Conference on the Edges of Innovation for Smarter Cities and a founding member of Lehigh INE (Integrated Networks for Electricity) Cluster.