

Abstract of the Talk:

Civil infrastructures such as water supply, transportation, power supply, waste water management systems have been supporting human activities since the beginning of civilization. Any disruption to these services directly affects us. Contrary to traditional monitoring approaches where a few specialized sensors passively monitored civil infrastructures, technological advancement has enabled unimaginable improvement in monitoring. Specifically, the Internet of Things has enabled large scale monitoring. However, the information collected needs to be processed correctly through specialized services. Cyber-Physical Systems (CPS) enable this interaction by tying together computation, communication, and control. Cyber-Physical Systems for civil infrastructure monitoring is an essential step to improving communities.

The path towards Cyber-Physical Infrastructures faces several research challenges. A CPS has three key components – Communication, Computation, and Control. From the communication perspective, traditional networking paradigms may be insufficient to address the challenges in certain environments. E.g., in a Water Distribution System, underwater wireless communication is very different from terrestrial environments. From a controls perspective, the challenge is to take efficient control decisions to achieve a desired performance (e.g., controlling the flow of water to drive sensors to specific regions). This talk will discuss the research challenges in communication and control, propose solutions for a specific case study of water distribution systems, and present future research directions.

Biography of the speaker:

Dr. Mahima Agumbe Suresh received her PhD from the Department of Computer Science and Engineering at Texas A&M University in December 2015. She is a member of the Laboratory for Embedded & Networked Sensor Systems (LENSS) headed by Dr. Radu Stoleru. She received her B Tech degree from the National Institute of Technology, Karnataka, Surathkal, India in 2009. Her research interests include wireless sensor networks and cyber-physical systems, algorithms, protocol design and modeling. She has published in several peer reviewed conferences and journals, been a member of the shadow program committee at IPSN 2015, and a peer reviewer at several conferences and journals.