Computer Science Distinguished Seminar

Challenges in Designing Secure Critical Infrastructure

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Complex and critical public infrastructure includes systems for water treatment, water distribution, power generation and distribution, and mass transportation. Cyber attacks on such systems are on the rise. Successful attacks have caused major disruptions in critical public services and made international news headlines. This talk will focus on challenges faced in the design of secure critical infrastructure and explain physics-based approaches being implemented in realistic testbeds and large-scale operational water treatment plants for detecting cyber attacks. Research problems that ought to be solved to realize the dream of a highly resilient critical infrastructure will be highlighted.

Bio: Aditya Mathur is professor and head of the Information Systems Technology and Design pillar at the Singapore University of Technology and Design (SUTD), and Center Director of iTrust--a center for research in cyber security. Aditya' recent research contributions focus on the design of secure public infrastructure. As Center Director Aditya manages a 50+ group of researchers in cyber security and has led the design and operationalization of three fully operational research testbeds for water treatment, water distribution, and power generation, transmission, and distribution. Aditya is a co-inventor of Distributed Attack Detection (DAD) that makes use of invariants derived from plant design for detecting anomalies in process behavior that may arise due to cyber or physical attacks.

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