Predictability and Security for Cyber-Physical Systems

Prof. Dr. Frank Mueller, Systems Lab, North Carolina State University

Many of today's cyber-physical systems (CPS) are subject to, mission-critical control requirements, from power grids to autonomous, driving. This talk highlights methods to provide non-traditional, security and end-to-end timing predictability in such systems.

Security in real-time CPS has been an afterthought, even though such, systems are networked. To complement conventional cyber security, techniques, we present three mechanisms for time-based intrusion, detection exploiting information obtained by static timing analysis.

End-to-end timing predictability, required for mission-critical, systems, presents another challenge for CPS. We show how, software-defined networking (SDN) opens up new opportunities to create, a complete software stack in support of end-to-end timing bounds on, communication that includes middleware, end nodes, and network, switches to give assurances for real-time schedulability and, resilience.