

Cyber-Physical Systems: Analysis and Design

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Abstract: Cyber-physical systems (CPS), such as smart grids and intelligent transportation systems, are complex systems where software and hardware components are seamlessly integrated towards performing well-defined tasks. However, this integration increases the vulnerability of CPS with more chances/higher possibility of cyber-attack that could cause severe consequences to economics, society, and human beings. Hence, cyber-security is a critical and important issue to be addressed in CPS. In this talk, the security of CPS is discussed from the perspectives of attackers. We will introduce the background of CPS and security issues, and some existing work on cyber-attacks. We then present our recent work on the design of stealthy hybrid attacks to CPS, which enables attackers to launch hybrid cyber-attacks more effectively to maximize system performance degradation with less chance to be detected. In turn, the attack strategies proposed would challenge the defenders to develop more effective, efficient and resilient methodologies to possibly detect hackers' intrusions, and maintain the systems operating in a secure, reliable and desired mode.