ARCAI 2024 Special Session " Security-Aware State Estimation and Control for Cyber-Physical Systems "

Principal Organizer(s): Jun Song

1. Professor Jun Song, Anhui University, jun_song@ahu.edu.cn

Call for Papers:

Abstract: Cyber-physical systems (CPSs) are integrations of computation, communication and control in order to achieve the desired performance of physical processes, which have been applied in a broad range of areas such as intelligent transportation, smart grid, chemical process control, and process automation systems. The increased coupling between physical components and cyber layers makes CPSs vulnerable to malicious attacks, such as denial-of-service attacks, deception attacks and replay attacks, to name a few. It's worth noting that malicious cyber-attacks not only can cause disruption to system services but also create dangers in the real world. Particularly, how to detect malicious attacks and estimate system states in a timely fashion such that the damage to cyber-physical systems can be controlled within a tolerable limit is of great significance. However, with the development of cyber-physical systems, the form of malicious attack becomes more complex and variable, even beyond our cognition. On the other hand, assumptions on malicious attacks in most literature remain irrational when applied in practical scenarios. Therefore, there is significant interest in developing efficient attack detection, state estimation and security control methods against unknown malicious attacks. Although secure problems are widely studied in academic and industrial communities, there remain some special security issues in CPSs that need to be addressed such as the speed of alarm response, the design of detection threshold, the performance analysis of state estimation, resilient control against variable attacks, co-design of attack detection and state estimation in CPSs and so on.

This invited session “Security-Aware State Estimation and Control for Cyber-Physical Systems” aims to gather some active researchers in the areas of attack detection, state estimation and security control theories in the same room and bring together the latest approaches to achieve efficient detection and secure estimation in CPSs.

The topics include but are not limited to:

- Cyber-Physical Systems
- State Estimation
- Security Control
- Network Attacks

Accepted and presented papers will be submitted for inclusion and indexed by EI Compendex and Scopus, subject to meeting EI scope and quality requirements. Selected papers will be invited to SCI Journal Special Issues.