IEEE Transactions on Industrial Cyber-Physical Systems

CALL FOR PAPERS

for Special Collection on

System and Embedded Device Security for Openly Deployed Industrial Cyber-Physical Systems

Theme: Advancing technology in data communication and processing, such as 5G and AI, supports the use of intelligent devices within the Industrial Cyber-Physical Systems, which improves everyday applications and impact on safety and efficiency of systems. Many of these systems require devices to be deployed on public area, without the benefit of additional physical security. For example, insecticidal lamps or grain quality sensors large area of farmland, wildfire monitoring UAVs in forested areas, or roadside sensing infrastructure for traffic control. While these systems are susceptible to conventional security issues, i.e., remote hacking, there is also a risk that attacker could physically access or influence the device's operation, e.g., holding a flame next to a temperature or fire sensor to give false alarm. Apart from being crucial parts of the system, some of these devices themselves are also of very high value and therefore attractive to attackers. The reliability and security of these devices are therefore worthy of attention, as well as how systems ensure reliable operations even if devices are subject to attacks or damage. Consequently, a wide range of research issues could be explored to provide new approaches for publicly deployed devices and systems to protect themselves. Thus, this special section focuses on providing physical safety, security and reliable strategy for openly deployed ICP systems, and it aims to provide a forum for researchers from diverse interdisciplinary areas to present their latest achievements. This special section seeks strong applied work, with experimental validation in demonstrably non-consumer/industrial applications and representative devices. Works with focus on theoretical cryptography and protocols are not within scope.

This special collection will focus on (but not limited to) the following topics:

- Active defense system in ICP systems
- AI for maintaining integrity of sensor data and early detection of anomalous data
- Structural reliability and safety analysis of deployed ICP systems
- Secure hardware design, and hardening, of devices physical safety and security (hardware/side channel attack on ICP platforms could also be considered)
- Identifying and classifying malicious attacks and fault induction on devices
- Resilient monitoring and data processing design tolerating damaged/compromised devices
- Device forensic and secure logs for deployed devices
- System-level design for reliable and fast recovery from attacks
- Reliability analysis and remote diagnosis of sensor/device faults
- Remote devices attestation and sensor accuracy checking/calibration
- Artificial malicious behavior intention prediction, including adversarial learning protection
- Collaborative tracking and positioning of outdoor multi-sensing devices, including detection and subsequent secure tracking of stolen devices

Manuscript Preparation and Submission

Follow the guidelines in "Information for Authors" in the IEEE Transaction on Industrial Cyber-Physical Systems http://www.ieee-ies.org/pubs/transactions-on-industrial-cyberphysical-systems. Please submit your manuscript in electronic form through Manuscript Central web site: https://mc.manuscriptcentral.com/ticps . On the submitting page #1 in popup menu of manuscript type, select: SC on **System and Embedded Device Security for Openly Deployed Industrial Cyber-Physical Systems**

Submissions to this Special Collection must represent original material that has been neither submitted to, nor published in, any other journal.

Note: The recommended papers for the collection are subject to final approval by the Editor-in-Chief. Some papers may be published outside the special collection, at the EIC discretion.

Timetable: **Deadline for manuscript submissions December 30, 2023**
Expected publication date (tentative) June, 2024

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