Special Issue on

Decentralized Blockchain Applications and Infrastructures for Next Generation Cyber-Physical Systems

Call for Papers

Cyber-physical system (CPS) integrates both cyber world and man-made physical world using sensors, actuators and other Internet of Things (IoT) devices, to achieve stability, security, reliability, robustness, and efficiency in a tightly coupled environment. Prevalence of such cyber-physical ecosystem (inherently of distributed nature) imposes exacting demands on architect models and necessitates the design of distributed solutions and other novel approaches. This is essential in order to suitably address the security and privacy concerns since CPS ecosystem involves humans as a part of its core. Blockchain technology offers a distributed and scalable solution to maintain a tamper-resistant ledger, which does not require a central authority. Thus, it can best fit the need of distributed solution to above mentioned security issues in CPS. However, the challenge in integrating Blockchain with CPS is yet to be addressed, which requires various cyber-physical nodes to work effectively and collaboratively in an asynchronous environment. The goal of this special issue is to bring together researchers from different sectors to focus on understanding security challenges and attack surfaces of modern cyber-physical systems, and architect innovative solutions with the help of cutting-edge blockchain related technologies.

Potential topics include but are not limited to following:

- Blockchain and mobile systems
- Security of transportation system using blockchain
- Use of blockchain to support mobile smart services and applications
- Blockchain in edge and cloud computing
- Blockchain schemes for decentralized secure transaction
- Distributed ledger and consensus schemes for CPS
- Performance optimization of blockchain and decentralized schemes
- Energy aware protocols and blockchain applications
- Fault tolerance and blockchain for CPS
- Decentralized (mobile) processing, computing, and storage infrastructure
- Blockchain for Software-defined networking based CPS
- Cybersecurity, protection, integrity, trust and privacy issues for SDN-based CPS
- Blockchain and smart contracts for CPS security
- Use of blockchain in CPS application, e.g., Smart Cities, Logistics or Industrial production, Healthcare
- Use of blockchain in secure architectures, cyberattacks, resilience for critical infrastructures like Smart Grid

Important Dates

Full Paper Submission: Nov 30, 2019

Decisions on Acceptance/ Rebuttal: Mar 30, 2020

Final Papers Submission: May 1, 2020

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