IEEE Transaction on Industrial Informatics

CALL FOR PAPERS
for Special Section on

Real-time Edge Computing over New Generation Automation Networks for Industrial Cyber-Physical Systems

Theme: The growing popularity of Industrial Cyber-Physical Systems (ICPS) and Industry 4.0 visions in recent years has led to an increase in the research around industrial automation networks. ICPS are usually characterized by stringent requirements, such as real-time performance and ultra-high reliability, and hence demand dedicated computing and networking technologies. For instance, the introduction of real-time edge computing over new generation automation can significantly shorten the latency of decision-making for ICPS and reduce the network transmission load, which can bring about changes in industrial production methods.

The following new developments are to set the stage for ICPS: (a) the convergence of Operation Technologies (OT) and edge computing technologies for low-latency requirements; (b) the integration of 5G and time-sensitive networks (TSN) for time-sensitive applications; (c) the ubiquitous deployment of dedicated, and multi-purpose, sensors for collecting real-time information about our environment and systems; (d) the exchange of critical information via heterogeneous wired and wireless communication networks in low latency but high reliability; (e) real-time processing and storage of information over distributed edge/fog and centralized cloud-based computing architectures; and, most importantly; (f) the virtualization of industrial real-time networks and containerization of hardware for improved manageability and scalability. These "real-time" cyber-physical systems are slated to be the technological backbone of future smart manufacturing and automation towards the Industry 4.0. To address the emerging challenge of real-time systems, this special section aims at providing a leading forum for disseminating the latest results of research, development, and industrial applications in this multidisciplinary area of communications, computing and control.

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

- Real-time OT edge computing
- Virtualization and containerization of real-time computing resources
- 5G-TSN integration for industrial automation
- Real-time digital twins in ICPS
- Real-time network algorithms and protocols
- Real-time computing architecture
- Real-time resource scheduling and allocation
- Real-time data acquisition and analytics
- Real-time networked control systems
- Real-time multi-robot systems
- Real-time optimization algorithms
- Real-time system security
- Real-time CPS and IoT applications and use cases in Industry 4.0

Manuscript Preparation and Submission

Follow the guidelines in "Information for Authors" in the IEEE Transaction on Industrial Informatics http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics . Please submit your manuscript in electronic form through Manuscript Central web site: https://mc.manuscriptcentral.com/tii . On the submitting page #1 in popup menu of manuscript type, select: SS on **Real-time Edge Computing over New Generation Automation Networks for Industrial Cyber-Physical Systems**.

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Regular manuscript length is 8 pages.

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

Timetable:

Deadline for manuscript submissions	September 30, 2021
Expected publication date (tentative)	April 2022

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