

Call for Papers
Special Session on Reliable Wireless Mechatronics for the Factory Floor

17th IEEE International Conference on Factory Communication Systems (WFCS 2021)
June 9-11 2021

Focus

Wireless technology has recently become an important focus of study in the modernization of the industrial workcell. Discussed within the parameters of Industry 4.0 and Smart Manufacturing, wireless technology promises the advantages of cost reduction by the elimination of cables and conduits to the enablement of a high degree of mobility of autonomous actors within the workcell that includes aspects of collaborative robotics, supervisory control, and safety. Leveraging these promises, engineers within the industrial space are looking to replace wires within their automation control systems thereby creating a wireless cyber-physical system (or a *wireless mechatronic* system). By seeking to replace those cables, a new increased risk of failure exists due to the use of wireless where cables were once deployed. Wireless technology succumbs to sources of disruption where wired technology appears to be immune. Radio interference and congestion all limit the performance of the industrial wireless network and could therefore lead to a difference in performance of the physical system being controlled within the workcell. Challenges of wireless mechatronics systems include the tracking and control of movable equipment, collision avoidance, spatial reconfigurability, dynamic wireless channels, and the maintenance of safety all of which require aspects of real-time communications, spatial reconfigurability, and energy efficiency. An additional challenge of deploying wireless for automation within the factory floor includes the identification of key performance indicators (KPIs) for the informational and operational technology components of the wireless automation systems within the factory workcell. This special session will focus on the concepts, design approaches, performance test and evaluation methods, and metrics within wireless mechatronic systems.

All papers of the special session must be up to 8 pages following IEEE conferences template and will go through the regular papers submission process of WFCS, using the following link: <https://konferenzen.jku.at/wfcs2021/content/calls>

The special session will focus on (but not limited to) the following topics:

- New directions in reliable wireless sensor/actuator signaling within the factory
- Advances in wireless robotics systems, collaboration, actuation, monitoring, and control
- Advanced modulation and coding techniques for wireless sensor/actuator communications
- Comparisons of wireless technologies applicability to mechatronics systems
- Advanced approaches to wireless-control co-design for improvement of reliability metrics
- Wireless channel modeling for highly dynamic factory operational scenarios
- Realizable wireless diversity approaches for improving system reliability
- Advanced strategies in applying wireless in safety integrated systems (SIS)
- Methods to capture, analyze, and use data from heterogeneous wireless sensor/actuator sources
- Real-world wireless applications, demonstrations, and results of solutions from testbeds, simulations, and live deployments
- Practical contributions, solutions, and real use cases for wireless in Industry 4.0.
- Ontologies within wireless mechatronics systems, common terminologies and definitions
- Requirements analyses of latency and reliability for wireless mechatronics systems
- Metrics, methods, and key performance indicators in industrial wireless automation

Regular and Special Session Paper Submission:

Deadline: Feb. 12th, 2021

Notification: Apr. 12th, 2021

Final versions due: Apr. 19th, 2021

Registration opens Apr. 12th, 2021

Organizers of this Session:

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