

ETFA 2022

27th INTERNATIONAL CONFERENCE
ON EMERGING TECHNOLOGIES
AND FACTORY AUTOMATION

STUTTGART, GERMANY
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Enabling robust, converged networks for Industry 4.0

Organized and Co-Chaired by

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- ❖ **FOCUS.** Nowadays several communication technologies are combined in order to serve a wide spectrum of industrial OT and IT applications. They are delivering sufficient performance but are typically realised in different isolated networks, thus increasing the complexity and costs of the industrial network infrastructure. Therefore, one of the future challenges in the area of industrial communications will be related to the efficient integration, configuration and operation of heterogeneous OT and IT networks: “converged” networks. Each communication technology brings a set of features, partially different from each other, that have to be adjusted accordingly in order to build an efficient heterogeneous communication system. In the meantime, several technologies have been developed that can allow faster and easier convergence of industrial network systems and at the same time exploit the potential of the Industry 4.0, such as Time-Sensitive Networking, OPC UA PubSub, Single Pair Ethernet, etc.
- ❖ **AIM.** The aim of this workshop is to present and practically demonstrate the state of the art of some of the key enabling technologies of Industry 4.0, such as SPE, TSN and OPC UA PubSub, and to evaluate how these facilitate the convergence of OT and IT networks for Industry 4.0. This workshop will deliver high quality lectures by experienced domain experts, describing the potentials as well as the limits of the technologies mentioned above. To facilitate the interactive discussion, the workshop will be accompanied by several live demonstrations using industrially relevant equipment, that practically show the current possibilities of the mentioned technologies, a number of measurement tools and methods, and aspects of robustness such as EMI/EMC and redundancy.

The objectives towards the attendants are:

- ❖ To provide insight in the state of the art by means of a lecture on each topic.
 - ❖ To evaluate properties and explore (current) limits by means of live experiments on industrially relevant demonstrators developed in the CINI4.0 (<https://www.cini40.eu>) project.
 - ❖ To present and discuss measurement tools and methods during the demonstrations.
 - ❖ To facilitate an interactive discussion.
- ❖ **WORKSHOP FORMAT.** A 4 hour workshop, about half of which are live demonstrations and measurements. To the workshop several top experts will be invited who will present the topics mentioned above and demonstrate live selected aspects.

Workshop: September 6, 2022

Workshop Topics

- ❖ Lectures on fundamentals & state of play of:
 - ❖ Time-Sensitive Networking
 - ❖ Single Pair Ethernet
 - ❖ OPC UA PubSub
 - ❖ Robustness of networks against EMI from industrial viewpoint
- ❖ Live demos and experiments on:
 - ❖ Converged OT & IT traffic in brownfield TSN compared to PROFINET RT
 - ❖ TSN pre-emption and measurement tools
 - ❖ SPE and measurement tools
 - ❖ Robustness against EMI
 - ❖ TSN Redundancy (802.1CB)
 - ❖ OPC UA and TSN Integration
- ❖ Interactive discussions
- ❖ Total duration 240 minutes