27th INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES AND FACTORY AUTOMATION

ETFA 2022

STUTTGART, GERMANY
SEPTEMBER 6th-9th 2022

Call for Papers
Digital twins, components and systems for smart mechatronic applications

Organized and Co-Chaired by
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❖ **FOCUS**. The workshop will focus on vertically distributed edge-to-cloud intelligence for machines, robots and other human-in-the-loop cyber-physical systems having actively controlled moving elements. They face ever-growing requirements on long-term energy efficiency, size, motion speed, precision, adaptability, self-diagnostic, secure connectivity or new human-cognitive features. Those requirements are relevant in many sectors like semiconductor production, industrial robotics, health care robotics, packaging machines, CNC machines, etc.

❖ **TOPICS**

- ❖ Novel HW architectures (SoC+FPGA, ASICs, RISC V, …) for motion control
- ❖ Smart computer vision systems, high-speed vision systems
- ❖ Smart wireless sensors, novel principle sensors (also self-powered)
- ❖ Smart high-performance servo-drives
- ❖ Smart control algorithms (robust control, vibration control, repetitive control)
- ❖ Hard real-time control systems
- ❖ Self-commissioning, performance monitoring and condition monitoring of machines
- ❖ AI, machine learning and deep learning in the context of motion control applications
- ❖ Industrial communication protocols and cyber-security tools for motion control apps
- ❖ Motion planning, path planning, collision avoidance
- ❖ Modelling and simulation platforms, FMI/FMU
- ❖ Identification of complex robots and machines
- ❖ Predictive maintenance of robots and machines
- ❖ General digital twin technologies
- ❖ Digital twin as a service, machine design as a service
- ❖ Optimization of robots and machines
- ❖ Case studies, applications and demonstrators

❖ **AIM.** Research on digital twin technologies is affecting all of engineering domains. Specifically, one can see huge interest of applying digital twin technologies in smart production technologies, robots and mechatronic devices. However, lots of components and systems must be modelled, each with a bit different approach. The proposed workshop should focus on specific systems (SW, HW, sensors, actuators) that are necessary to run machines in optimal way. Next, workshop will focus on specific toolchains and modelling platforms that allow to model those components and integrate partial models into bigger units using standardized interfaces.

❖ **WORKSHOP FORMAT**. Half-day workshop based on solicited research papers

❖ **AUTHOR'S SCHEDULE (2022)**

- ❖ Regular and special sessions papers
  Submission deadline .... May 13
  Acceptance notification .... June 10
  Deadline for final manuscripts .... June 24

Workshop: September 6, 2022

Workshop Program Committee

- ❖ **Martin Goubej,** University of West Bohemia, Czech Republic
- ❖ **Luca Pulina,** Università degli Studi di Sassari, Italy
- ❖ **Mikel Armendia,** Fundación Tekniker, Spain
- ❖ **Roberts Kadikis,** EDI - Institute of Electronics and Computer Science, Latvia
- ❖ **Dip Goswami,** Technical university of Eindhoven, Netherlands
- ❖ **Niceto R. Luque,** University of Granada, Spain
- ❖ **Petr Blaha**, Brno university of technology, Czech Republic
- ❖ **Max van Haren**, Eindhoven university of Technology, Netherlands
- ❖ **Max van Meer**, Eindhoven university of Technology, Netherlands
- ❖ **Miroslav Flidr**, University of West Bohemia, Czech Repiblic
- ❖ **Enrico Villagrossi**, National Research Council - Institute of Intelligent Industrial Technologies and System for Advanced Manufacturing

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