Open Invited Track Proposal:

Enabling technologies and applications in Industry 4.0

Track Organizers:

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Abstract:

The new transformation of the industry to gain competitiveness and meet the challenges of the future, known as Industry 4.0, requires the integration of a set of enabling technologies to achieve high levels of efficiency and productivity. Industrial Internet of Things (IIoT), Cyberphysical Systems, Cloud Computing Ecosystems, Robotic Systems, Horizontal and Vertical Integration, etc., are some of the technologies that in conjunction with others (Big Data, Augmented Reality, Deep Learning, Digital Twin, etc.) defined a set of new technological challenges that are essential to cope with technological change in industry.

IFAC technical committee(s): *TC3.1, TC3.2, TC3.3*

Detailed description:

Enabling technologies in the field of industry 4.0 will allow to exploit the potential of the Internet of Things (IoT) in the industrial environment and improve the productivity and efficiency of processes.

These technologies can be grouped in a first level formed by the physical world with a strong relevance for cyberphysical systems (CPS) and robotic systems (RS). A second level allows the secure communication of the physical part with the digital part by establishing software layers in the form of public and private clouds. Finally, the third level forms the intelligence layer through the techniques of artificial intelligence to obtain the maximum benefit from the lower layers.

This open invited track provides an opportunity to present and discuss research and development works in the topics:

- Hardware-Software architectures for Industry 4.0
- Cyberphysical systems (CPS)
- Robotic systems
- Cloud computing ecosystems
- Middleware integration and communication. Horizontal and Vertical integration.
- AI in Industry 4.0

- Digital Twin
- Big Data techniques
- Security in industrial environments
- Industrial applications based in emerging technologies

References:

[1] RAMI4.0 (DIN SPEC 91345:2016-04) status report. https://www.zvei.org/fileadmin/user_upload/Themen/Industrie_4.0/Das_Referenzarchitekturmodell_RAMI_4.0_und_die_Industrie_4.0- Komponente
[2] “Interoperability between IIC Architecture & Industry 4.0 Reference Architecture for Industrial Assets”. https://www.infosys.com/engineering-services/white-papers/Documents/industrial-internet-consortium-architecture.pdf
[3] Industria Conectada. Gobierno de España. http://www.industriaconectada40.gob.es
[4] VDMA Guidelines. https://industrie40.vdma.org/documents/4214230/0/Guideline%20Industrie%204.0.pdf/70abd403-cb04-418a-b20f-76d6d3490c05
[5] “Industrial internet reference architecture” (IIRA). http://www.iiconsortium.org/IIRA.htm
[6] VDMA Industrie 4.0. https://industrie40.vdma.org/ueber-uns
[7] Industry 4.0: Digitalization for productivity and growth, European Parliament Research Service, document PE 568.337, September 2015.