INTERNATIONAL

INVITED SESSION SUMMARY

Title of Session: Semantics-Driven Cyber-Physical Systems

Name, Title and Affiliation of Chair:

Dr. Linda ELMHADHBI, INP-ENIT, University of Toulouse, France
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Details of Session (including aim and scope):

Today we are living in an increasingly connected Cyber-Physical world (i.e. machines, sensors, software, etc.), in which all organizations are facing tremendous challenges on how to exploit the amount of generated data in order to propose intelligent systems and services of tomorrow's society. Accordingly, the development of Cyber-Physical Systems (CPSs) is the new revolution of engineering systems. Advancements in CPS technologies have growingly been part of the emerging trends of ICT such as the Internet of Things (IoT), Digital Twins, Big Data, cloud computing, robotics, blockchain, as well as paradigms like Industry 4.0 and Smart Cities. However, the large volumes of data produced by CPSs is growing exponentially, besides its increasing heterogeneity due to the variety of the system components and resulting from the emergence of increasingly sophisticated and precise acquisition devices. Understanding data more effectively is a key factor to semantically link the results of automatic analysis and learning (recognition, prediction, etc.) with the formal description of the global context (domain, environment, application, society, etc.). By creating a common understanding of the meaning of data, semantics-driven Artificial Intelligence play an essential role in the process of exploiting this massive and heterogeneous data to provide insight and solve problems around monitoring, control, decision-making, and prediction about the functioning of CPS and its behaviours. Research in this area is, therefore, identifying new directions to upgrade the efficiency and automation of the understanding and analysis of data flows in CPS.

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

- Semantics-driven design of CPS
- Ontologies and knowledge graphs for CPS
- Situation semantics and situation awareness for CPS
- Semantic interoperability for CPS
- Semantic provenance and knowledge acquisition for CPS
- Semantic data management and integration for CPS
- Data flow in CPS
- Knowledge-based decision making in CPS
- Data processing and AI in CPS
- Knowledge discovery and reasoning in CPS
- Semantics-driven CPS applications
- Semantics for Cyber-Physical Social Systems (CPSS)
- Semantics and causality (explainability) in CPS

Website URL of Call for Papers (if any):

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