2021 IEEE 17th International Conference on Automation Science and Engineering

Workshop on "Developing a Common Knowledge on Digital Twins for Smart Manufacturing Systems"

August 23rd, 2021, Lyon, France

Abstract:
The latest developments in industry involved the deployment of digital twins for both long and short term decision making, such as supply chain management, production planning and control. Modern production environments will create value from data loops, from sensors to actuators, making optimal decisions aligned with the evolution of the system thanks to the real time predictions of digital twins. As a result, the development and implementation of digital twins seem to be a key for the success of smart manufacturing systems. However, what digital twins are in practice and how industries can fully use their potentialities is still an open debate both in academia and industries. Indeed, digital twins are not uniquely identified by the manufacturing community. The fact that digital twins can be conceived differently and for different decisions to represent the same manufacturing system does not help to clarify. Furthermore, different research communities approach digital twins with different perspectives that sometimes can also lead to extremely different concepts. All this has created a lot of misunderstandings and a sort of cloudy effect on the term digital twin.

This workshop will contribute to develop a common knowledge on digital twins and put the basis for a technical multi-disciplinary committee. A panel of scholars and practitioners from manufacturing industries will discuss the role of digital twins in manufacturing and their future perspectives. Scholars will come from different research communities such as IEEE-RAS, IFAC, INFORMS. A list of fundamental questions will be posed to panelists who, in turn, will share their ideas and position. Conclusions will be drawn at the end of the workshop.

The workshop will be hybrid, i.e. face-to-face with online participation for those who cannot travel to Lyon.

Moderators:
- Marco MACCHI   Politecnico di Milano (Italy)
- Andrea MATTA   Politecnico di Milano (Italy)

Speakers and panelists:
- Stephan BILLER   Advanced Manufacturing International (USA)
- Martin FABIAN   Chalmers University of Technology (Sweden)
- Ajith PARLIKAD   University of Cambridge (United Kingdom)
- Guodong SHAO   NIST (USA)
- David ROMERO   Tecnológico de Monterrey (Mexico)
- Fei TAO   Beihang University (China)
- Matthias THURER   Chinan University (China)

AGENDA

C.E.T. Time	Theme	Speaker/Panelist
14h30-15h15	Digital Twins for Smart Manufacturing Systems: Current Trends and Outlook	Speaker: F. Tao
15h15-16h00	Panel 1 - Digital twin manufacturing framework: decision support, technology platforms, data & interoperability in cyber-physical systems	Panelists: A. Parlikad, G. Shao, M. Thurer Moderator: M. Macchi
16h00-16h15	Break	
16h15-17h00	Panel 2 – Digital twin manufacturing scenarios: from logic definition to business application	Panelists: S. Biller, M. Fabian, D. Romero Moderator: A. Matta
17h00	Closure of the workshop	