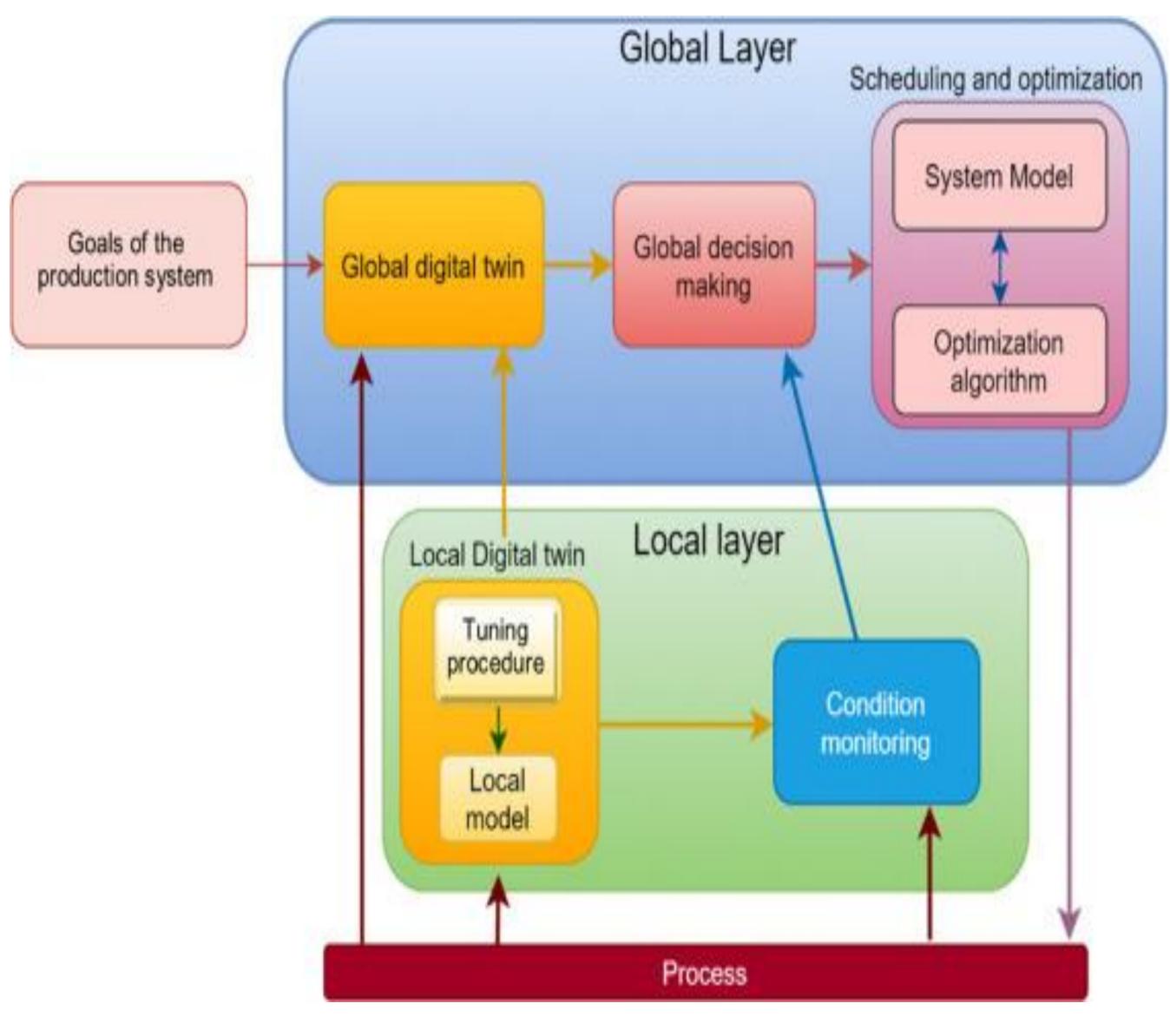
FACULTY SEMINAR

Date: April 4th, 2024, 1:15 PM Place: Narbutta 85, NT 144

> "Digital twins for advanced decision support through the lifecycle of manufacturing systems" prof. Marco Macchi, Politecnico di Milano



DOI: https://doi.org/10.1016/j.arcontrol.2021.04.008

Abstract:

Digital twins are envisioned as a key component for advanced decision support through the lifecycle of different socio-technical systems. This vision can be discussed by relying on the growing literature that brings perspective of applications of digital twins across different lifecycle phases. In this context, as they are an essential part of a cyber-physical system, digital twins are showing the potential to provide advanced functionalities for monitoring and prediction, control and evaluation of the performance of the physical assets, up to the inclusion of optimization use cases. Given this general trend, the current presentation focuses on the adoption of digital twins to support decisions and activities related to the manufacturing systems along their lifecycle.

The purpose is to reflect on the relevance of the lifecycle management as a driving concept in order to deal with different requirements posed on digital twinning for decision-making. Model-based and data-driven methods are ensembled in the digital twin models, and this approach is described through selected examples of decision support, ranging from the design and virtual commissioning, to the production and maintenance management tasks. As a concluding remark, some final reflections are included in the light of the interactions between humans and digital twins; this enables to foster the role of humans within a digital twin-enabled management system.

Position:

Full Professor at Politecnico di Milano.

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