

## Einladung zum Vortrag

- Vortragender:** Prof. Dr. Giovanni Lugaresi, KU Leuven
- Zeit:** Mittwoch, 17.06.2026, von 11.00 Uhr bis 12.30 Uhr
- Ort:** Raum H005, Gebäude 3
- Thema:** Adaptive Digital Twins: Integrating Data-Driven Model Generation and Validation in Production System Digital Twins

### Abstract

The increasing complexity and variability of modern manufacturing systems call for digital twins that go beyond static simulation models toward adaptive, continuously evolving decision-support tools. Despite significant industrial adoption, current digital twin implementations remain constrained by high modelling effort, limited integration with operational systems, and persistent challenges in maintaining model validity over time. This talk presents a cohesive vision for self-evolving digital twins, centered on automated model generation, lifecycle-aware architectures, and tight integration with information systems. Building on recent advances in process mining and graph-based modelling, digital twin models can be generated directly from production data while preserving structural correspondence with physical systems. When coupled with simulation engines, these models can reproduce real control logic, enabling policy-consistent what-if analyses. At a higher level, the talk frames these developments within the emerging twinning paradigm. Particular emphasis is placed on online validation, automated calibration, and multi-paradigm modelling strategies that enable digital twins to remain valid, trustworthy, and actionable throughout their lifecycle.

**Interessenten sind herzlich eingeladen.**