

Multi-Agent-Systems (MAS) in Automated Production Systems

Semester Thesis/Master's Thesis (SA/MA)

Lehrstuhl für Automatisierung und
Informationssysteme
Technische Universität München
Prof. Dr.-Ing. Birgit Vogel-Heuser



Research Gap:

A new technological framework for production should enable the KI.FABRIK to manufacture various mechatronic products using fully modular, reconfigurable, highly automated, and integrated technologies. A significant difference from previous concepts is the direct physical interaction with the factory environment through robots and similar systems and the intuitive and transparent connection between humans and machines through wearable technology. Reliable and real-time multi-agent systems (MAS) should enable decentralized factory planning.

Research Goal:

Coordination of multiple agents, existing agent patterns, and the Asset Administration Shell (AAS) of the I4.0 platform and current work on realizing these with agents should be considered in the design and implementation. A concept of the MAS and its related hardware and software elements, e.g., Robot, MiR, supermarket cell, assembly cell, and central agent, should be developed. The communication script of MAS should be implemented for two use cases of Wittenstein and BMW. Finally, the concept should be evaluated and tested.

Requirement:

- A precise and structured approach to work
- Creativity and reliability
- Experienced in Python, capability of learning new tools and methods (e.g., DSL4Production)
- Good German/English skills

In case of interest, please send your curriculum vitae and current grade transcripts to the contact below.

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