Master Thesis - “Enhancing Shop Floor Management through an Interactive Digital Twin”

(30 credits/20 weeks – 1 student)

Project Background

Digital twin technology has emerged as a transformative tool in the manufacturing sector, enabling the creation of virtual replicas of physical systems. These digital twins allow for real-time monitoring, simulation, and optimization of manufacturing processes. The integration of real-time data and interactive capabilities is crucial for effective shop floor management, as it enhances the ability to monitor machinery, predict maintenance needs, and optimize production workflows.

Despite the advancements in digital twin technology, current shop floor management systems often face limitations in terms of real-time interaction and comprehensive control. Traditional systems may lack the ability to integrate live camera feeds and digital process views, which are essential for a holistic understanding of the shop floor environment. This gap highlights the need for a more integrated and interactive solution that can provide detailed insights and control capabilities.

The proposed project aims to address these limitations by developing an interactive digital twin for shop floor management. This digital twin will not only provide real-time interaction with shop floor machinery but also integrate live camera feeds and digital process views. By doing so, it will enhance monitoring and decision-making processes, leading to improved efficiency and productivity on the shop floor. The project will leverage advanced technologies such as the Internet of Things (IoT), machine learning, and augmented/virtual reality (AR/VR) to create a robust and functional digital twin system.

Further, the assignment offers a unique opportunity to work in a creative environment, supervised by the Global Technology Centre at GKN Aerospace in Trollhättan.

Assignment Description

- Familiarize with the Topic and Make a Detailed Plan of the Project
- Conduct a literature review on existing digital twin technologies and shop floor management systems.
- Analyze case studies of digital twin implementations in manufacturing.
- Design a framework for developing the digital twin.
- Select and utilize appropriate tools and technologies (e.g., IoT, machine learning, AR/VR).
- Develop control capabilities through the digital twin interface.
- Test and validate the digital twin’s functionality and performance.
- Evaluate the effectiveness of the digital twin using predefined metrics.
- Document and Present findings and outcomes

Qualifications

Student in the final year of their M.Sc. studies in the field of Production Systems, Robotics, Automation, Mechatronics, Computer/Data Science or similar with a strong interest in sustainability and data science.

Contact

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Last date for application: 2024-11-30. Interviews will be held continuously and the position could be filled prior to the last application date.