

Master Thesis - “A Comprehensive Study of Industrial Communication Protocols and the Development of a Universal Connection Tool”

(30 credits/20 weeks – 1 student)

Project Background

In the rapidly evolving landscape of industrial automation, communication protocols play a pivotal role in ensuring seamless and efficient operations. These protocols facilitate the exchange of data between various devices and systems, enabling real-time monitoring, control, and automation of industrial processes. However, the diversity of communication protocols, each with its unique features, strengths, and limitations, presents a significant challenge for industries aiming to optimize their operations.

This thesis project aims to conduct a comprehensive study of industrial communication protocols, benchmarking them for different applications with a focus on security and reliability. By evaluating these protocols in various industrial scenarios, the research will identify the most suitable protocols for specific applications, considering factors such as type of data, data transmission speed, error handling, scalability, and interoperability. In addition to benchmarking communication protocols, this thesis will contribute to the creation of a universal data collection system. This system aims to standardize data acquisition and integration across different industrial platforms, enhancing data accessibility and usability. The development of this system will be carried out in collaboration with another thesis project, ensuring a multidisciplinary approach and leveraging diverse expertise. The outcomes of this research will provide valuable insights for industries seeking to enhance their communication infrastructure, improve operational efficiency, and ensure robust security and reliability. By identifying the best-suited communication protocols and contributing to the development of a universal data collection system, this thesis will play a crucial role in advancing industrial automation and digital transformation.

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 an Extensive Literature Study and Current State Analysis of Industrial Communication Protocols
- Identify Gaps in Current Protocols and Stakeholder Interests
- Specify Requirements for Benchmarking Protocols
- Select Methods and Tools for Benchmarking and Develop the Evaluation Framework
- Test and Analyze Protocols in Various Industrial Scenarios
- Identify Opportunities for Future Implementation and Technical Development
- Document and Present Results



Qualifications

Student in the final year of their M.Sc. studies in the field of Computer/Data Science, Production Systems, Robotics, Automation, Mechatronics, 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.