

# **Master's thesis at Stena Industry Innovation Lab: Designing an efficient automated material flow**

**To be conducted during the autumn semester of 2021**

## *Background*

The master's thesis project is part of an ongoing research project, *SCARCE II*, where Chalmers participates alongside RISE and the Royal Institute of Technology, as well as several prominent industrial parties. Among the participating companies are Siemens, AFRY and Parker Hannifin. The overall focus of the project is the improvement of supply chains by use of digital solutions for conveyance of real-time data as well as application of automated material handling solutions. You can read more about the research project SCARCE II here: [The sensible value chain - SCARCE II | RISE](#).

The thesis project constitutes an important part of SCARCE II and focuses specifically on automated material handling. The thesis project extends a currently ongoing activity at Parker Hannifin's production plant in Trollhättan, where potential efficiency improvements are identified in the in-plant logistics. This ongoing activity is to be concluded in August. Most of the in-plant logistics processes at Parker Hannifin are currently managed manually, but it is perceived that performance could be significantly improved by an increased level of automation.

## *Aim of the thesis project*

Taking one of Parker Hannifin's existing in-plant material flows as a point of departure, along with the efficiency potentials that have been identified, the aim of the thesis project is to design and evaluate an automated material flow that displays a high efficiency and short throughput times. The specific activities performed in the flow will be decided during the thesis project, as part of the design, but are likely to include picking, sorting and transport, all of which should then be automated.

## *Approach*

The students will have access to the facilities at the Stena Industry Innovation Lab ([sii-lab.se](http://sii-lab.se)) and the material handling equipment there. They will be provided much freedom to design an efficient automated material flow, reflecting the potentials identified at Parker Hannifin. Depending on the potentials identified at Parker Hannifin, and on the design choices made by the students, the material flow may make use of both robot picking and automated transports by use of the autonomous mobile robot (AMR) available in the lab.

## *Qualifications*

To successfully conduct the thesis project, the students should have some previous experience with computer programming (e.g. Matlab, Python, Java, or similar languages), ideally related to web services and machine to machine communication. Previous experience and course credits related to production management and logistics are also meritorious.

## **Contact**

Patrik Fager, Chalmers Department of Industrial and Materials Science  
[fagerp@chalmers.se](mailto:fagerp@chalmers.se)