Department of Electrical Engineering, E2
Chalmers University of Technology

Projektförslag för kandidatarbete

Autonomous Transport Robots with 5G

Chalmers, together with AB Volvo and Ericsson, are developing ATRs for next generation of material deliveries in factories and warehouses. Autonomous transport robots (ATRs) can autonomously navigate around in factories and warehouses together with humans and traditional forklifts. The ATRs perception system is based on either cameras mounted in the ceiling of the factory/warehouse and/or cameras on the ATR itself.
A global control tower is responsible for coordinating a fleet or robot such that they safely and with given time-windows deliver parts to the given destinations.

Figure 1. ATR built as a bachelor project 2021.

Problem description
In this project the task is to implement and evaluate real-time communication between the ATR and the global control tower, and to evaluate 5G with respect to latency, throughput, quality of service, and also for positioning the ATR. Example of data streams include control signals to/from the robot and video streams. The ATRs are available but they have to be updated to support 5G communication. The evaluation will be done in the CASE-lab that has a complete setup of a 5G for industrial applications. Ericsson will be supporting the communication aspects of the project.

Suitable background: TKAUT, TKELT, TKMAS, TKDAT, TKTFY
Group size: 3 to 6 students
Number of groups: 1

Prerequisites: Interested in real-time communication (5G), Programming (mainly Python and Robot Operating System (ROS)).

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