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.

Problem description
In this project the task is to implement and evaluate real-time communication using 5G between the ATR and the global control tower with respect to latency, throughput, quality of service. This will be used to control the mobile robots to follow defined trajectories using the camera system. The evaluation will be done in the CASE-lab that has a complete setup of a 5G for industrial applications.

Suitable background: TKAUT, TKELT, TKMAS, TKDAT, TKTFY

Group size: 3 to 6 students

Number of groups: 2

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

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Project report: English