Department of Electrical Engineering, E2
Chalmers University of Technology

Projektförslag för kandidatarbete

Autonomous Transport Robots – Human-robot interaction

AB Volvo and Chalmers 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 in the ceiling of the factory/warehouse and/or cameras on the ATR.
A global control tower is responsible for coordinating a fleet or robot such that they safely and with given time-windows deliver parts to given destinations.

Figure 1. ATR built as a bachelor project 2021.

Problem description
Based on an ATR that was developed as a bachelor thesis project during 2021, see Figure 1, the task is to develop a user-interface for the operators that are to interact with the ATR. This include two main aspects, (i) the ATR has to communication its intentions to the surrounding, such that humans working close to ATR will understand what the ATR is about to do in the near future. (ii) allowing human operators to show their intentions to the ATR, for example, when they are done loading or unloading the ATR. This will include development of both software and hardware.

The project will be in collaboration with AB Volvo.

Suitable background: TKAUT, TKELT, TKMAS, TKDAT, TKTFY
Group size: 3 to 5 students
Number of groups: 1

Prerequisites: Programming (mainly Python and ROS), and electronics.

Contact person: Knut Åkesson, tel. 031-7723717, email: knut@chalmers.se,
Per-Lage Götvall, Volvo GTO, R&TD