

Collaborative-Robot Assistant for Technicians

Background

The next generation of service Robots will help humans with repetitive and high-loaded tasks. One of the crucial challenges is the deployment of service robots in naturalistic human spaces, where humans and robots can share spaces, information, and skills to achieve a common purpose. In services such as maintenance, where automation solutions have shown limited results, the deployment of Robots offers a promising solution. Maintenance is an essential component in the aftermarket business which is present in many industrial domains. For automotive companies, such as AB Volvo, the aftermarket team tries to minimize the downtime during the maintenance of their trucks. This service involves tasks with uncomfortable postures for the workers, such as carrying heavy objects and working in forced postures (see above figure). Such problems can be mitigated by introducing Robots to assist the technicians.

Cobot assistant for technicians



Problem and goal

This project aims to investigate the use of the service robot named TIAGo in a real industrial scenario. Concretely, this project has the following objectives:

- Design and development of a Mockup scenario that resembles a truck maintenance bay, as shown in the above figure. Such a scenario should be scaled to fit the robot capabilities.
- Develop the robot controller that ensures that the robot executes some given actions in the mockup scenario.
- Design and deploy a 3D printed exchangeable tool gripper to allow the robot to switch between different tools needed to remove the truck's wheel.

For this project, the students will use the TIAGo service robot. An important part of the project is to develop the control of the system with the help of ROS (Robot Operating System). This project is in collaboration with Volvo trucks.

Målgrupp: TKAUT, TKDAT, TKTFY, TKELT, TKTEM, TKMAS, TKITE (preferable a mix project group)

Gruppstorlek: 3–6 studenter

Antal grupper: 1

Förkunskapskrav: Basics on Computer Programming, basic knowledge on Control.

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