Division of Systems and Control

Department of Electrical Engineering
Chalmers Institute of Technology

Bachelor thesis proposal

Design of Light, crash-worthy, Self-Driving Bike

Background

In a research project the department develops self-driving bikes with the purpose to be used in test-driving experiments where vehicles' safety systems for bike safety are tested. Volvo Cars, Veoneer, Autliv and AstaZero are partners in the project. The bicycle drives pre-defined trajectories carrying a dummy to look as similar as possible as a real biker to the vehicle's sensor system. So far, the bikes are modification of normal bikes. For some tests there is a risk for the bike to be hit by the car at high speed, and for such tests there is a need of a light and crash-worthy self-driving bike, and that is the goal of this project.

Problem description

The project task is to build a light and crash-worthy self-driving bike. This includes mechanical design to make the bike stiff so that it becomes easier to control. The electronics also need to be designed and it can be downsized compared to the normal bike which is much heavier.

To the right a commercially available light bike is shown. It cannot drive like a normal bike and must be towed. This limits the kind of tests which can be performed.

Purpose and aims

- Design and build a portable system for self-driving bikes.
- Validate and demonstrate on some different bikes.

We are searching for two highly motivated students from the Mechatronics program or similar background. Experience in electronic design and control is of value.

The student will gain competences within mechanical and electronical design, real time control vehicle test procedure.

Contacts:
Prof. Jonas Sjöberg, tel. 031-772 1855:, E-mail: jonas.sjoberg@chalmers.se