Mechatronics HK 2022

**A Short Summary from the AD-EYE TEAM**

Since 2017, researchers at KTH have been developing a platform for research in autonomous driving, the AD-EYE platform. The AD-EYE platform supports a virtual simulation environment, enabling simulation of a vehicle driving autonomously at KTH Campus.

The task was to replace the simulation platform with a physical vehicle and develop a test bed for further development and research of autonomous driving features. This test bed may be considered as a first step towards the future goal; an autonomous driving infrastructure at KTH Campus.

The brain of the system is the On Board Unit (OBU), the Alienware. The OBU conducts all the calculations necessary and runs the AD-EYE platform. Several sensors have successfully been integrated on the vehicle, such as a camera, a LiDAR and a GNSS. The camera is necessary for the vehicle being able to detect and identify objects in the surrounding environment. The camera has been interfaced to the AD-EYE platform, so that the output of the camera can be seen in the simulation environment. Additionally, the LiDAR has successfully been interfaced to the AD-EYE software, enabling perception and distance measurements of the environment. The GNSS is necessary for localization of the vehicle in space. We have also created an electrical wiring that powers the sensors, the OBU and other important components of the system.

For enabling communication between the different parts of the system, an internal communication system, the Controller Area Network (CAN) is used. The control commands for enabling different features of the vehicle, such as turning the wheels or activating the hazzard lights, are communicated through CAN. The CANoe software is used for manually sending messages through the CAN network and is a windows based application that enables sending and receiving control commands to and from the vehicle.

We hope that this test bed will be used for further development of the autonomous driving infrastructure at KTH campus.

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