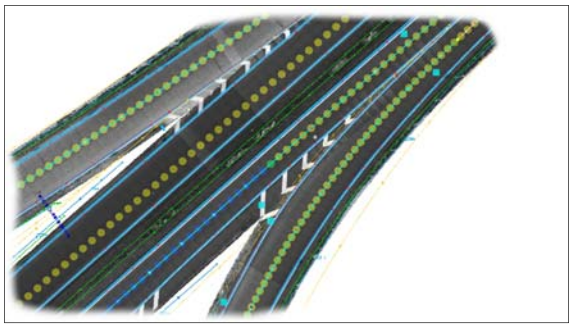
Master´s Thesis

Prototyping a Driver Assistance System based on OpenDrive data

On the way to autonomous driving the automobile industry has embedded lots of on-board sensors into the modern car. Apart from GNSS positioning, optical sensors like LiDAR and cameras are complemented by non-optical sensors, such as radar and ultrasonic sensors. These form the basis for many established driver assistance systems. Though, on-board sensors will not be able to tell the driver what to expect round the next corner, or after the next hill. To foresee the road ahead a driver will have to rely on map data in order to foresee the road ahead.



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Such map data has to be very detailed and spatially accurate. A so called HD Map, can be modelled in the OpenDrive format. OpenDrive is an open xml file format for the logical description of road networks. It contains analytical information about road geometry (e.g. lane width), distinct types and logical interconnections of lanes, signs and signals including dependencies and road objects.

This Master´s Thesis aims to create a driver assistance system prototype, based on OpenDrive data, that can support anticipatory driving with augmented reality. Upcoming events, such as slopes on the road, or sharp corners, that affect anticipatory driving, shall be extracted from a given OpenDrive dataset and processed, so that a virtual driving car would receive valuable road information. In this prototype the information is to be given to a driver using a mixed reality smartglass interface. The master thesis candidate should design an augmented layer that can inform a driver about upcoming difficulties. The Microsoft HoloLens shall be used as a substitute to an augmented windscreen. A demo should be created that demonstrates the running prototype.
The candidate should have an interest for data-driven automated driving applications, augmented reality and should be prepared to do some coding for creating the HoloLens application.

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