3D Visualization of Autonomous Vehicles Virtual Driving and Control

Development of methods for autonomous driving in complex traffic scenarios is a very active research topic worldwide, and also at Linköping University. Due to the complexity, visualization of vehicle behaviors and internal controller states has a potential to be a useful tool for better understanding and development of better algorithms for safer and more efficient autonomous operation in complex scenarios.

The purpose of this project is to design a 3D virtual environment to enable modeling and testing of traffic scenarios on a desktop computer. The simulator contains different parts, e.g., choosing a photo realistic map, scenario/road selection, and vehicle model choice.

A key component is also the visualization of internal control objectives and state variables. Vehicles with different dynamical models and various control methods can be selected to investigate the effects of control method and traffic environment on the traffic flow during maneuver. The simulator should be able to use some predefined and panoramic street maps like Google Maps as well as to demonstrate 3D model of vehicles, roads, traffic lights, signs, trees, pedestrians. The simulator will be able to use real world open street map real-time online or offline data.

The simulator can be programmed in any language, e.g., C++, Python, ROS or Matlab.

Students are allowed to work on the project in a group of two people. Involved researchers at the Department of Electrical Engineering (ISY), Linköping University are

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Contact us if you think this sounds interesting and fits your profile of competence.