

Master Thesis / Bachelor Thesis (2019)

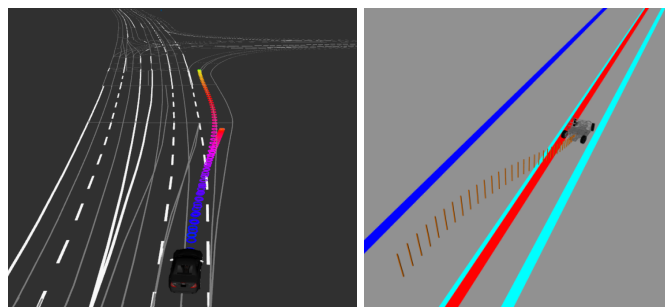
## Safe Stop Trajectory Planning for Highly Automated Vehicles

Highly automated vehicles should always have a "Plann B". This thesis focus on the generation of safe stop trajectory for self-driving cars. If the vehicle can no longer proceed on a planned trip, it must be capable of performing a safe stop, known as a "minimal risk condition" or fallback. For this thesis, the current environment (HD-map, dynamic objects etc.) will be provided as background information.

The goals of this thesis are:

1. Develop a spline based model or optimization based model for generating safe stop trajectory in high-way or in less complicated environment.
2. Develop a search-based model for complicated dynamic environment as well as goal oriented scenarios, such as stopping on the goal position (parking spot etc.), which is better than just pull over the car on the right side of the road.

The algorithm should fulfill the car restrictions (accelerations, velocities) and motion model. Besides, the comfort of the passengers (reduce accelerations and jerks) should also be optimized. The results should be first proven in the simulation, can also be tested on real cars.



We are happy to answer questions regarding the topic, reference literature or alternative topics. In this case please contact the supervisor below for further information.

Requirements: Knowledge of Python or C++  
Knowledge of ROS (Robot Operating System)  
Basic Knowledge of optimization and path planning is preferred

Keywords: Automated Vehicles, Motion Planning

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