

Bachelor Thesis / Semester Thesis

Camera-based classification of current road conditions

Controlling autonomous vehicles under all circumstances requires accurate knowledge of the current road friction conditions. Human drivers intuitively realize slippery road conditions caused by alternating weather conditions. An autonomous vehicle has to approximate the friction potential and thus the longitudinal and lateral acceleration limits by evaluating the input of different sensors. One of those can be the camera to classify the current road condition and thereby estimate the friction coefficient of the road.

The scope of this thesis is to review different concepts of camera-based friction estimation and evaluate their performance. Afterwards an algorithm should be developed and applied to a selected database. The solution should be compared to state-of-the-art implementations.

Work packages:

- Literature review on camera-based friction estimation
- Selection of an adequate database
- Selection and implementation of an algorithm for road surface and condition classification and derivation of the friction coefficient
- Benchmark with current solutions for various disturbance parameters (confusion matrix)

Requirements:

- Programming experience in Python or C++
- Experience in image recognition and processing

The thesis can be written in English or German Language.

Prof. Dr.-Ing. M. Lienkamp

Supervisor: Sven Goblirsch, M. Sc.

Start: _____

End: _____