

Student Assistant / Thesis

Infrastructure-based Localization for Autonomous Vehicles

Problem Statement

Self-localization is a critical capability of autonomous vehicles. In combination with a digital map, high-precision localization can be used to determine, among other things, the exact relative position of the current lane geometry and other critical information about the environment. Therefore, localization is essential for safe vehicle guidance.

Even commercial and costly GPS systems do not provide sufficient accuracy, especially in urban environments. For this reason, camera- or LIDAR-based methods are primarily used for localization in automated driving. Maps are used here, which are supplemented by features that can be recognized while driving. While these algorithms tend to perform better in urban areas than GPS, these approaches have their own drawbacks. Even state-of-the-art approaches suffer from issues with long-term stability, scarcity or ambiguity of the features. This project pursues the development of low-cost localization system that is aided by infrastructure-based features to overcome the problems of both approaches.



Your Tasks

- ▶ Development of hardware for infrastructure-based localization
- ▶ Implementation of real-time localization algorithms

Your Profile

- ▶ Reliable and motivated student
- ▶ Experience with C/C++, Python, Linux, Microcontrollers
- ▶ Desirable: Experience with computer vision and machine learning

Our Offer

Positions are to be filled as soon as possible and are limited to 3 months. If suitable, an extension is possible/desired. The regular weekly working hours are 7-9 hours.

Contact

Please read our [Instructions for Applications](#).

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