



Multimodal Sensor Calibration for Autonomous Driving Applications

In the context of the AV2.0 project, software for a real-world autonomous vehicle is developed in cooperation with a lot of different institutes at TUM. The software represents the whole pipeline of autonomous driving: Starting at the sensor data acquisition, perception of the environment as well as planning of an ego trajectory and finally controlling the vehicle safely under diverse driving conditions in and around Munich.

Modern vehicles offer a wide range for environment perception sensors such as camera, lidar or radar sensors. However, to utilize this information as a whole, the data of multiple sensors has to be combined effectively which requires an accurate calibration of all sensor types. Therefore, the goal of this thesis is the development and implementation of a sensor calibration tool for different sensor modalities as well as multiple sensors with non-overlapping fields of view. TUM IAC



The first step of this project consists of a literature research on current developments in the field of multi-modal sensor calibration. In the second step, a calibration algorithm is developed which fuses and aligns the data of multiple sensors. The next step includes the implementation of this method within an interactive user interface. Finally, the calibration method has to be tested and validated under real world conditions. In addition to that, the software should be designed in a modular design manner to work with different prototype vehicles and be made available to the public (open source).

Work packages

- Literature research on sensor fusion and calibration
- Develop a suitable calibration algorithm
- Implement an interactive calibration tool
- Test and validate the calibration method

Requirements

- Programming experience in Python or C++
- Experience with the Robot Operating System (ROS2)
- Ideally experience with Docker
- Involved working attitude

Should you be interested in this project or any other project in the context of autonomous driving, send a CV and transcript of records to:

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