Autonomous Racing – Sensor Fusion and Calibration

In the context of the Indy Autonomous Challenge, software for an autonomous racing vehicle is developed at the Chair of Automotive Technology. This software manages the whole process of autonomous driving: Starting at data acquisition by the sensors, perception, planning and finally controlling the vehicle safely under racing conditions with multiple opponent vehicles.

Modern vehicle sensors offer a wide range for environment perception such as Cameras, LIDAR and Radar sensors. To utilize this information, the sensor data has to be fused which requires an accurate calibration of all sensor types. The goal of this IDP is the development and implementation of a sensor calibration tool for all sensor modalities.

The first step of this project consists of a literature search for 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 evaluated. 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 about sensor fusion and calibration
- Develop fusion and calibration algorithms
- Implement an interactive calibration tool
- Test and evaluate the calibration method

**Requirements**

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

Should you be interested in this project or any other project of the Indy Autonomous Challenge, send a CV and transcript of records to:

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