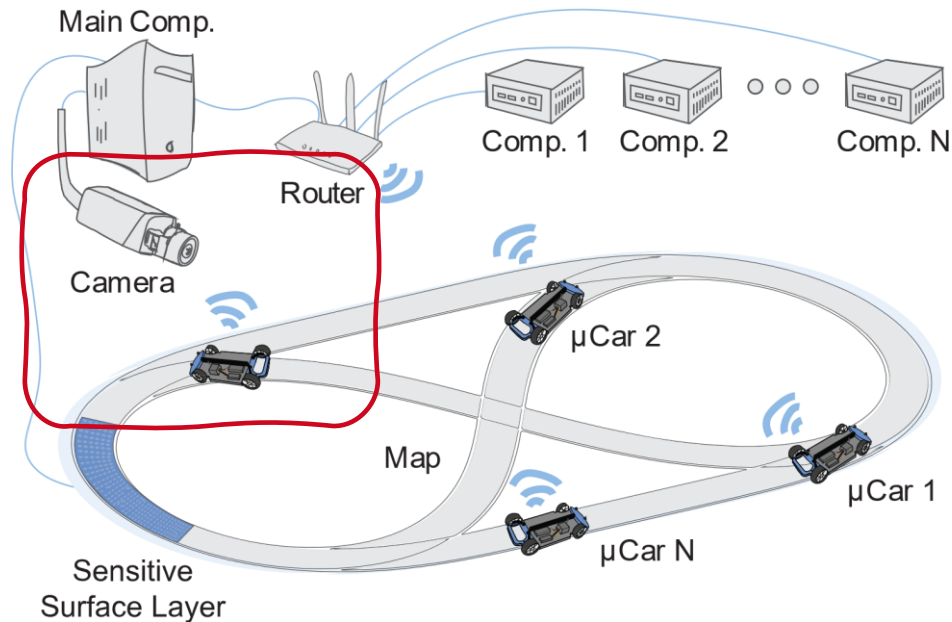


Student Assistant / Thesis

Dynamic Error Estimation of an Artificial GNSS



Problem Statement

The Cyber-Physical Mobility Lab (CPM Lab) is an open-source platform for networked and autonomous vehicles. It consists of 20 model-scale cars for experiments and a simulation environment. The model-scale vehicles (μ Cars) are equipped with sensors, actuators, and wireless communications. A camera-based Indoor Positioning System (IPS) computes the positions and orientations of the vehicles. The μ Cars and the IPS communicate with external computation units that run algorithms for networked and autonomous vehicles.

Even if pixel-accurate, position estimation via a camera is not free of inaccuracies. The position detection at the outer detection range is less accurate than at the centre directly underneath the camera. Multiple aspects influence the accuracy, like the type of lens and the perspective on the vehicles. This work aims to find an approach that dynamically performs a spatial error estimation and provides this information alongside the position estimation. As a second step, this error estimate will be used as a new input for a downstream GNSS estimation to generate artificial GNSS data. The error introduced by the GNSS soft sensor should be based on the error of the IPS.

Your Tasks

- ▶ Recording a series of measurements in the [CPM Lab](#) as a base for the error estimation.
- ▶ **Find at least one model-based method for error estimation of the IPS.**
- ▶ **Extend the existing GNSS pipeline with an error estimation step.**

Your Profile

- ▶ Experience or interest in C/C++, Python or comparable programming languages.
- ▶ Reliable, motivated, independent.
- ▶ Desired but not required: Experience with ROS2.

Contact

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

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