

IDP, BA, SA, MA

Localization for Autonomous Motorsport



The TUM Autonomous Motorsport team made history winning the Indy Autonomous Challenge (IAC) 2021 – the first autonomous racing competition at the Indianapolis Motor Speedway (IMS). Since then, the challenge has expanded further with several events taking place at prestigious racetracks, such as the Las Vegas Motor Speedway or the Autodromo Nazionale Monza. Following this great success, the Abu Dhabi Autonomous Racing League (A2RL) was launched recently, with its first event taking place at the Yas Marina Circuit in 2024. At both competitions, teams from several international universities compete by developing a software stack for identical vehicles. Localization is a critical component of the software, ensuring that vehicles accurately determine their position on the racetrack while driving against each other at velocities $>200\text{km/h}$. Unique challenges for this topic arise due to the high speed and GNSS-denied environments. This requires the use of additional sensors, such as LiDAR, camera and IMU for a reliable and precise localization.

Are you interested in the topic of localization for autonomous motorsport?

Then apply for a student research project, an interdisciplinary project, or a thesis in the TUM Autonomous Motorsport Team. Your ideas and algorithms will have the opportunity to be used on a real race car. Your software can become an integral part of the overall software of the TUM Autonomous Motorsport Team.

Qualifications:

You should be able to independently familiarize yourself with the topic and the tools and have a structured way of working. You should be motivated to work in a fast-paced environment and eager to collaborate with a highly motivated team of students and Ph.D. candidates. Ideally, you have programming experience in Python and C++ and know the ROS2 framework.

Contact:

If you are interested in this project, send your CV, transcript and a short motivation to:

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