Announcement for Autonomy Technology Team Project

Getting Started: Roboracer

Motivation

Autonomous racing represents one of the most challenging and exciting applications of autonomous driving technology. Unlike conventional self-driving vehicles, race cars operate at the limits of handling, requiring ultra-fast decision-making, precise trajectory planning and tracking, and real-time adaptation to dynamic conditions. The Roboracer project aims to establish a research platform for testing and developing cutting-edge AI-driven planning and control strategies in a high-performance setting.

Through this project, students will gain hands-on experience in developing autonomous systems that can handle high-speed scenarios, optimize decision-making under uncertainty, and push the boundaries of state-of-the-art algorithms. Furthermore, the technologies developed for racing environments can contribute to advancements in real-world autonomous driving applications, making this an ideal project for those passionate about robotics, AI, and autonomy.

Task description

This project will focus on the initial setup and foundational work required to participate in future Roboracer challenges

- Setup the code base
- Get started within the Roboracer simulation
- Identify necessary steps to successfully participate in future challenges
- Implement and compare existing perception and planning frameworks
- (Hardware setup and real world tests)

The specific task assignment can be further defined based on the existing knowledge.

Requirements

- Strong motivation and commitment, along with the ability to work independently
- Advanced studies in Autonomy Technologies
- Knowledge in at least one of the following areas: modeling, control, optimization, AI
- Solid programming skills, preferably in Python, C++, as well as ROS2

If you have any questions, please feel free to contact Philipp Hartmann (see below).

Contact

Lars Ullrich, M.Sc.
Lehrstuhl für Regelungstechnik
lars.ullrich@fau.de

Philipp Hartmann, M.Sc.
Lehrstuhl für Regelungstechnik
philipp.k.hartmann@fau.de