Chair of Automatic Control

FAU

Announcement for Autonomy Technology Team Project

RoboRacer: Join the Future of Autonomous Racing

Motivation

Autonomous racing pushes the boundaries of perception, planning, and control under extreme conditions. Without a human fallback, the vehicle must perceive, decide, and act entirely on its own — fast, safely, and reliably.

The RoboRacer project challenges student teams to design, implement, and operate a full autonomous driving stack in simulation and on a real racing platform. The final test: compete on the track against other teams.

Task description

Teams will collaboratively develop, integrate, and validate an autonomous driving stack for a scaled racing vehicle. The project includes:

- Implementation of a complete AD stack covering Perception, Estimation, Planning, and Control.
- Development and testing both in simulation and on the physical platform.
- Competition against other teams on the racing track to evaluate performance and robustness.

Subtopics:

- Perception: Environment modeling and sensor data processing.
- Estimation: Localization, state estimation, and uncertainty handling.
- Planning: Trajectory generation, optimization, and decision-making.
- Control: Motion control, stability, and tracking accuracy.

Each team member takes responsibility for one subtopic. Each team must have one designated leader. Teams are expected to integrate all modules into a functioning full-stack system.

Eligibility Criteria

- Open to M.Sc. students in Autonomy Technologies.
- Only complete team applications (4 students) will be considered; no individual applications.
- Each subtopic (Perception, Estimation, Planning, Control) must be represented by at least one team member.

- Strong motivation, collaborative skills, and the ability to work independently within an interdisciplinary team.
- Solid programming skills, preferably in Python, C++, and ROS2.

Application Procedure

Applications must be submitted as a single PDF per team and should include:

- *Team Overview*: Background, competencies, and assigned responsibilities.
- *Team statement*: Explain why this limited team project should be awarded to your team.
- *Academic Details*: Grades and current transcript of records for each team member.
- *CVs of all team members:* Combined in the same PDF.

Incomplete or individual applications will not be considered.

Project Outcome

By the end of the project, each team will have:

- Developed and integrated a full autonomous driving stack.
- Validated the system in both simulation and real-world conditions.
- Competed in the RoboRacer Challenge on the racing track.

If you have any questions, please feel free to contact us via the mail below.

Contact

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