



Autonomous Racing – Simulation Environment for Object Detection Training

In the context of the project Roborace, 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.



Modern vehicles sensors offer a wide range for environment perception such as Cameras, LIDAR and Radar sensors.

The detection of objects is performed with machine learning techniques that require vast amounts of data. To facilitate the learning process, we generate training data from simulation. The simulation environment can output the needed ground truth data. In this IDP, the current simulation in Unity shall be enhanced with further scenarios and the object detection algorithm shall be retrained and tested on the newly generated data.

In the first step of this project the foundation of environment modelling and scenario generation for autonomous vehicle simulation are reviewed. In the second step, further scenarios are semi-automatically generated for the current training pipeline. An existing 3D object detection algorithm is to be retrained on the new data and evaluated against the prior implementation.

Work packages

- Literature search about scenario generation and application in Unity
- Semi-automatic scenario generation in Unity
- Retraining of an object detection algorithm
- Evaluation of the implemented of the trainings result on real life data

Requirements

- Ideally experience in C# and Unity or Unreal Engine
- Involved working attitude

Should you be interested in this project or in another project in the context of the Roborace project, send a short motivation letter, transcript and CV to:

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