providentia

Working Student (HiWi) Position

High-Fidelity CARLA Map for Autonomous Driving Simulation

Background

As part of the **Providentia++** research project under the initiative “Digital Test Beds for Autonomous Driving”, leading industry partners and research institutes are working together to develop intelligent transportation systems. The goal is to improve traffic safety, efficiency, and comfort through cutting-edge technologies.

Description

We are seeking a **Working Student (HiWi)** to support the **expansion and refinement of the Providentia++ simulation map**. The focus is on **enhancing visual detail, integrating real-world traffic elements, and ensuring functional road navigation within the CARLA simulation environment**. The role involves working with **CARLA, Unreal Engine, and 3D modeling tools** to improve and optimize the simulation. Please check the images below to see our current progress and project scope.

Your Tasks

CARLA Map Expansion & Traffic Simulation

- Create and integrate realistic 3D models (urban environments, traffic lights, cameras, buildings) into the CARLA map using **Blender**, **Maya**, or **RoadRunner**.
- Modify and extend **OpenDRIVE** (.xodr) to ensure accurate road geometry, navigation, and traffic signal logic.
- Ensure the CARLA map is fully functional for vehicle movement and traffic simulation without AI-based control.

3D Scene Generation & Optimization

- Refine and improve CARLA maps by enhancing visual quality, asset accuracy, and environmental details.
- Explore AI-assisted 3D modeling methods to accelerate scene creation and asset generation.
- Optimize assets and scenes in Unreal Engine for better performance and realism.

Requirements

Technical Skills & Tools

- Proficiency in 3D modeling tools (Blender, Maya, RoadRunner) and game engines (Unreal Engine).
- Experience with CARLA Simulator (importing .fbx, working with OpenDRIVE .xodr, traffic system setup) and basic Python/C++ knowledge for tool integration.

Problem-Solving & Optimization

- Ability to refine and improve 3D environments for autonomous driving simulations, ensuring both functionality and visual accuracy.
- Interest in AI-assisted 3D modeling to optimize and accelerate scene creation.

Keywords:

CARLA Simulator - Unreal Engine - 3D Modelling - RoadRunner - Blender - Maya - Traffic Simulation - Python/C++ - OpenDRIVE - ScenarioRunner - Autonomous Driving

Application:

We offer a **working student contract (HiWi) for up to 20 hours per week**.

If you are interested, please send your **CV** to the email below and indicate your **earliest possible start date**.

Contact:

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