Hiwi (m/w/d) gesucht

Reinforcement Learning-Based Trajectory Planning for Excavator Operations

Construction machines play a vital role in the construction and mining industries. There has been significant interest in automating mobile machines to improve efficiency and reduce reliance on manual operations. Recent research indicates that reinforcement learning (RL) is one of the most promising methods for automating mobile machines such as excavators. RL allows machines to learn optimal control by interacting with the environment. However, applying RL to the actual process control of mobile hydraulic systems remains challenging.

The focus of this project is to develop a solution for excavator automation using RL. The goal is to use RL to generate optimal and efficient digging trajectories. This project will address the complexity and reliability issues of applying RL to improve control of mobile hydraulic systems and achieve advanced automation in construction machines.

If you are interested in this project, please send your application documents (i.e., **a brief cover letter, curriculum vitae,** and **transcript**) to the email address below.

Aufgabengebiete:

- RL control: Using RL for excavator operations.
- Simulation including architecture design, training, and evaluation.
- Working language: English.

Arbeitszeit und Beginn:

- From now on.
- 20 – 40 h/month.
- Duration: after consultation, long-term cooperation is aimed for.

Voraussetzungen:

- Interests in reinforcement learning, mobile machines (e.g., excavators), control.
- Independent, responsible, and reliable working ability.
- Master's student specializing in machine learning, control, mechatronics, or similar.
- Knowledge of using RL methods (e.g., PPO, DDPG) for manipulator trajectory planning and control.
- Proficient in using simulation tools, e.g., **MuJoCo**, Gazebo, MATLAB Simulink.

Ansprechpartner:

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