ETH

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Distributed Computing

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Trackmania with Reinforcement Learning

Reinforcement Learning has been at the forefront of mastering games such as chess, Go, Shogi, Poker and DOTA. It has recently come to our attention that there exists a RL framework for Trackmania. Trackmania is a racing game where players can race against each other and create their own racetracks. The latest installment was released in 2020 and is free to play.

The research group that developed the RL framework for Trackmania developed a baseline that has yet to reach human-level performance. We are interested in building on top of this baseline and creating an RL agent that can keep up with and even beat human-level performance on any track. While working in this domain we will be exploring a variety of approaches and RL algorithms, focusing on obtaining a high racetrack performance with limited samples on novel racetracks.

In this thesis, we will use the `tmrl` package and environment to create and evaluate RL approaches on Trackmania with the goal of obtaining a racetrack-agnostic high-performing agent. Additionally, we would like to compete in the *Track-Mania Roborace League*. The first challenge will be to obtain a distributed experience gathering setup, e.g. by deploying several containerized virtual machines on our cluster to concurrently run the game environment.

Requirements: Knowledge in Python and Reinforcement Learning. Experience with virtual machines, docker, networking, and with PyTorch (or TensorFlow) and OpenAI Gym is an advantage.

We will have weekly meetings to address questions, discuss progress and think about future ideas.

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