HiWi Job
(English / German)

Distributed Machine Learning

In distributed learning, a set of devices (e.g., smartphones or sensor nodes) cooperatively learn towards a specific goal. Thereby, each device trains a local neural network with its own locally-collected training data. All devices periodically synchronize their knowledge to be able to benefit from each other and jointly achieve a better performance. Our chair is researching on distributed learning with devices that have limited resources, e.g., low computational power or little available energy. In this case, not all devices can train complex neural networks, but training needs to be very lightweight. We have done the proof of concept of this idea using simulations only, but we need now to test it with real devices.

The goal of this HiWi job is to implement distributed machine learning on real devices like Raspberry Pis and evaluate it. We use the Atari-2600 games as a benchmark for distributed reinforcement learning, in which all devices jointly learn by trial-and-error how to play the games. The implementation involves tools like tensorflow. The programming language can for example be Python or C++. Finally, the setup needs to be equipped with power sensors, e.g., based on an Arduino.

With building such a platform for distributed learning, you are directly helping in advancing research.

Skills acquired within the HiWi job
- Apply your programming experience to research on distributed learning
- Work in a research environment

Skills required for the HiWi job
- Programming skills (C++, Python)
- Experience with machine learning is beneficial but not required

Start Date
Immediately or within a couple of months.

Language
The collaboration with the colleagues can be in English or German.

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