Impact of Neural Network Quantization on the Behavior of PPO Agents in Mobile Networks

Bachelor's Thesis/Master's Thesis

Project

This work investigates the impact of quantization on the performance of neural networks implemented in a Proximal Policy Optimization (PPO) agent. The agent is used to trigger measurement reports in a mobile network simulation environment.

The goal of this work is to analyze the impact on the functionality of measurement report triggers, evaluate the efficiency gains achieved through reduced model sizes, and derive recommendations for the use of compressed RL models in mobile networks.

Tasks

1. Introduction to the fundamentals of RL in the context of mobile networks
2. Literature research on methods for quantizing and compressing NNs
3. Implementation/integration of quantization methods into existing PPO agents
4. Validation of results with uncompressed reference models
5. Evaluation of the impact on performance, memory requirements & stability

Requirements

✔ Basic knowledge of communications engineering and mobile communication systems

✔ Interest in machine learning and reinforcement learning

Institute

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