



Master thesis No. 945
Deep Learning for Transport Network Control



Methods

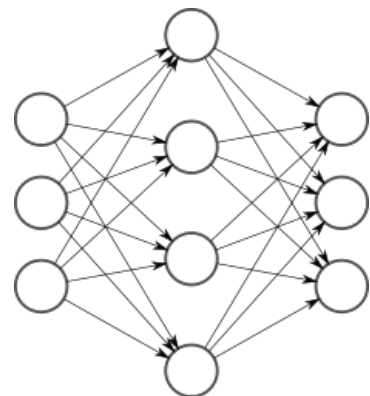
Performance Evaluation
Programming in Python
Deep Learning

Topics

Communication networks

Background

Novel and higher-quality Internet services fuel an exponential growth of traffic in internet service providers' transport networks. This leads to a significant increase in resource demand with large variations over time thus requiring more efficient and dynamic operation of future networks. The Software-Defined Networking (SDN) paradigm enables an efficient and dynamic (re)configuration of multi-layer transport networks. Optimal configurations can be obtained by various methods. The question arises, whether deep learning is capable of finding suitable configurations, too. Projects like Google's AlphaGo and Facebook's face recognition show the huge potential deep learning has to offer.



Task

The goal of this project is to investigate whether deep learning is applicable to special optimization problems from the field of communication networks (e.g. min-cost flow problem). To this end, you will familiarize yourself with current literature on deep learning. Subsequently, you will implement a test environment based on available deep learning frameworks, which allows for training and evaluation of deep networks. In this test environment you will evaluate different deep learning approaches with respect to their performance and scalability in solving selected optimization problems.

Acquired Knowledge and Skills

You will gain knowledge in the field of deep learning and you will learn about its capabilities and limitations. Furthermore, you will work with a large deep learning framework and gather experience in performance evaluation.

Requirements

Programming Experience in Python

Desirable knowledge

Communication Networks II

Contact

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