Chair of Communication Networks
TUM Department of Electrical and Computer Engineering
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Master's Thesis

Reinforcement Learning for joint/dynamic user and slice scheduling in RAN towards 5G

In the Radio Access Network (RAN), the MAC scheduler is largely inherited across generations in the past, to fit to new networking goals and service requirements. The rapid deployment of new 5G technologies will make upgrading of current ones extremely complicated and difficult to improve and maintain. Therefore, finding new solutions for efficient Radio Resource Scheduling (RRS) is necessary to meet the new KPI targets. 5G networks and beyond use the concept of network slicing by forging virtual instances (slices) of its physical infrastructure. A heterogeneous network requires a more optimized and dynamic RRS approach. In view of the development of SD-RAN controllers and artificial intelligence, new promising tools such as reinforcement learning can be proven useful for such a problem.

In this thesis, a data-driven MAC slice scheduler will be implemented, that maximizes user utility, while learning the optimal slice partitioning ratio. A deep reinforcement learning technique will be used to evaluate the radio resource scheduling and slicing in RAN. The results will be compared with traditional schedulers from the state-of-the-art.

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