

Master's Thesis

# ML based optimization of optical transport and network configurations

In recent years, innovations in optical transport technology, such as probabilistic constellation shaping or multi-band networks, lead to a significant increase in complexity of optical network planning and optimization. The use of simple planning heuristics leads to a highly suboptimal utilization of network resources and potentially underprovisioning of traffic demands. ML based optimization techniques are promising due to fast computation and approximation of optimal solution for complex problems. However, currently proposed ML models such as DeepRMSA do not yet support different lightpath configurations and flex-grid scenarios.

This work will extend DeepRMSA to more generalized scenarios and compare it to heuristic based planning. Furthermore, this work will explore ML based solution to lightpath configuration optimization for the case of a large number of possible modulations, enabled by probabilistic constellation shaping.

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