

Communication Network Design Lab – Task Submission (Task #3)

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1. Report for task submission to CND LAB

A. Describe the inputs (description on the traffic matrixes), and comment the results

Description of the Inputs

The network load was simulated using five different traffic matrices. The demand between different nodes in the network is determined by these randomly generated matrices. The Routing and Wavelength Assignment (RWA) problem is solved using the traffic matrices as input.

Nodes: The network used in this project is based on the NSFNET topology, which consists of multiple nodes and edges. In the optical network, each node represents for a point, and the edges are the optical links that connect the nodes. The network is loaded as a graph, from a JSON file.

Multiple Traffic Matrices: Five traffic matrices, each representing a different traffic demand between the nodes, are generated at random. These matrices' values are usually selected from a specific range.

Compare Result

The Heuristic model uses simple algorithms to assign wavelengths and route demands. The results of the Heuristic and ILP models are presented in a bar chart, where the success of demand routing and wavelength assignment is compared for each traffic matrix. In general, based on the results: Heuristic typically produces similar results to ILP, but the Heuristic model is slightly less optimal than the ILP model. The results showed that while the Heuristic model performs well, it is not as optimal as exact optimization methods like ILP.

