

Postdoc Search - Multi-level EON Network Defragmentation Project

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1 The Project

Given the significant digital transformation of society, the advent of 5G, and the array of applications that come with it, large telecommunications networks increasingly need flexibility. This flexibility should be reflected in an architecture that allows flexibility in all layers. The new generation of physical infrastructure in networks is elastic optical networks (EONs). These networks offer the ability to multiplex various types of applications into optical connections that can occupy variable bandwidths. However, this new technology creates a new problem. In fact, when these connections leave the network, they leave "gaps" in the spectrum, thus creating spectrum fragmentation. This problem implies that new connections will have difficulty being routed, greatly reducing the efficiency of the network. Open research questions include when and how to defragment, taking into account the routing of services above the optical layer.

We approach this problem with mathematical modeling, optimization, multi-level simulation, traffic study, and artificial intelligence. The project also includes the implementation of Software Defined Networking (SDN) concepts as a proof of concept for the developed algorithms.

2 Profile of the Desired Candidate

The desired candidate should have excellent judgment, excellent computer skills, and the ability to work in a team and show leadership in the project's evolution. He/she must have a background in operations research, machine learning, simulation, and computer science. Knowledge of telecommunications networks in general, optical systems in particular, and SDN is an asset.

3 Contact

If you are interested, please send your CV along with a copy of your doctoral thesis and your articles, in pdf format to brunilde.sanso@polymtl.ca with the subject `mitacs24 postdoc`.