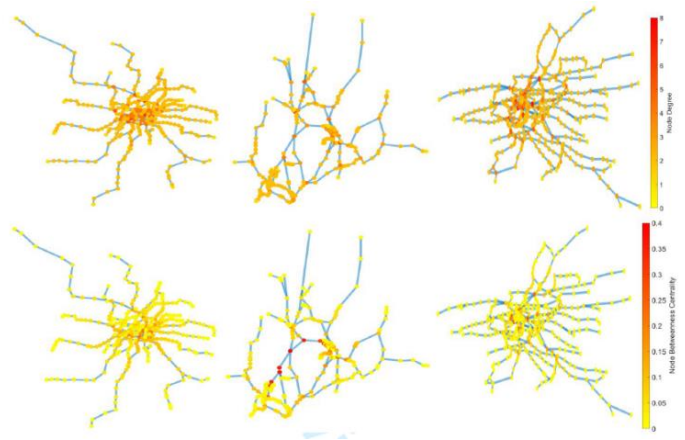


Topological Recoverability of Public Transport Networks



Problem description

Public transport networks are subject to recurrent disruptions that may result in severe consequences for network performance and the metropolitan metabolism as a whole. Network and graph theory-based tools enable the analysis of public transport network robustness and the relation between network topology and its robustness. A large number of studies have investigated public transport network vulnerability by studying the sequential removal of stations or links. In contrast, little is known about their ability to recover.

Assignment

In this project you will study public transport network recoverability, i.e. the ability of a network to recover to a desired performance level, after suffering failures or attacks. So far, recoverability analysis, which is based on principles from Network Science, has only been applied to synthetic instances and pure topological metrics, such as connectivity. This analysis has the potential to expand on some of the vulnerability analysis techniques commonly deployed for the investigation of transport networks.

The project will consist of the following steps:

- Importing public transport network graphs for a selected set of cities worldwide
- Designing alternative recovery strategies
- Design and conduct a set of failure and recovery experiments
- Analyse network recoverability in relation to its topological properties

The graduation project is part of the Assessing the Recoverability of Critical Infrastructural Networks (ARCIN) project funded by TU Delft Safety & Security Institute

Candidate

- Should have coding skills in Python or similar
- Have affinity and is intrigued by network science indicators (e.g. assignment 2 in CIE4811)

Research group

Smart Public Transport Lab at T&P, in collaboration with partners at TPM and EWI
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