

# Reduction of large flow networks towards scale-free structures

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In this talk we look at the problem of graph reduction towards a scale-free graph while preserving a consistency with the initial graph. This problem is formulated as a minimization problem and to this end we define a metric to measure the scale-freeness of a graph and another metric to measure the similarity between two graphs with different dimensions, based on spectral centrality. We also want to ensure that if the initial network is a flow network, the reduced network preserves this property. We explore the optimization problem and, based on the gained insights, we derive an algorithm allowing to find an approximate solution. Finally, the effectiveness of the algorithm is shown through a simulation on a Manhattan-like network.

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