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Quantification of graph dissimilarities using Information Theory

In this talk, we review a novel method to quantify graph dissimilarities. The pseudo-metric is an efficient and precise measure for network comparison, based on the quantification of differences between the distance probability distributions extracted from them. The measure can identify and quantify structural topological differences that have a practical impact on the information flow through the network, such as the presence or absence of critical. An extension to labeled graphs is also presented. In the case of multiplex networks, each layer possesses its own connectivity configuration, and the quantification of their dissimilarities is associated with the concept of "diversity". Layers with more dissimilar connectivity patterns create a more diverse multiplex structure. Several applications on real and artificial data are examined, exemplifying the usefulness of the measure in a variety of systems.

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Recent applications of Variable Neighborhood Search"

Over the past two decades, reverse logistics and closed-loop supply chain networks have gained substantial interest in business and academia. The dynamic lot sizing problem with product returns and recovery is one of the most extensively researched topics in inventory control literature. Several interesting generalizations of this optimization problem have lately emerged that include the multi-product case, the case with capacity constraints, and others. In this lecture, we present recent successful applications of Variable Neighborhood Search for the efficient solution of such problems, review the state-of-the-art solution methods, and also discuss some open research problems.
This is joint work with I. Konstantaras

Related references:
- Sifaleras, A., & Konstantaras, I. (2017). Variable neighborhood descent heuristic for solving reverse logistics multi-item dynamic lot-sizing problems. Computers & Operations Research, 78, 385-392.
- Sifaleras, A., Konstantaras, I., & Mladenović, N. (2015). Variable neighborhood search for the economic lot sizing problem with product returns and recovery. International Journal of Production Economics, 160, 133-143.