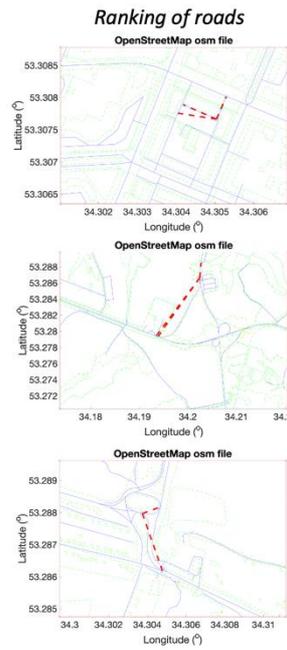
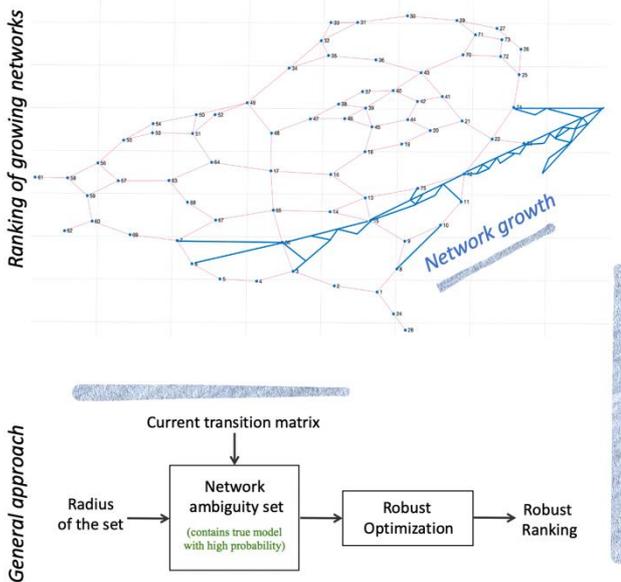


FindeX: Ranking of Growing Networks



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6.2177	
Keywords	Ranking, Optimization, Growing networks, Search engines, Scientometrics, Finance
Intellectual Property	
Software code	
Publications	A. Timonina-Farkas, R. Seifert "Information Retrieval under Network Uncertainty: Robust Internet Ranking". Under review in Operations Research, 2021. B. http://www.optimization-online.org/DB_FILE/2017/07/6135.pdf
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FindeX ranks networks accounting for their growth and the uncertainty in links. The optimal solution is robust to variations in network's size and structure.

Description

Ranking algorithms play a crucial role in information technologies and numerical analysis due to their efficiency in high dimensions and wide range of possible applications, including Internet ranking, scientometrics and systemic risk in finance (SinkRank, DebtRank). The traditional approach to Internet ranking goes back to the famous work of Sergey Brin and Larry Page, who developed the initial method PageRank (PR) in order to rank websites in search engine results. Recent works studied robust reformulations of the PageRank model for the case when links in the network structure may vary, i.e., some links may appear or disappear influencing the transportation matrix defined by the network structure. We make a further step forward, allowing the network to vary not only in links, but also in the number of nodes. We focus on growing network structures and we have

created a software for ranking of networks uncertain both in size and in structure.

Advantages

The software allows to rank nodes in a network accounting for the network growth and possible changes in its links. This is achieved via a combination of the robust optimization and the developed efficient algorithms. Compared to existing approaches, our methods provide rankings robust to structural changes. Our algorithms allow to rank networks of different dimensions, including networks of huge dimensions like the Internet.

Applications

- Ranking in search engines
- Ranking of journals in scientometrics
- Ranking of financial institutions
- Ranking of roads/streets
- Systemic risk in financial sector

- Cost control for road renovations