Last-updated: 2024/02/21, liangz

Project IDDS and more

members: Javaria, Wenruo, Azam, liangz

Aim

Observing that some practical issues can be modeled as or studied with the distance dominating set problem in networks, this study studies the scaling phenomenon of distance dominating in networks, first empirically then theoretically.

Networks

- Real-life networks downloaded from networkrepository.com.
- Artificially generated by well-known models such as ER, BA, WS, and more.
- Artificially generated by a new LZ-model.

Publication plan

- A comprehensive empirical studies (3 months) → at least a well-known network science conference.
- If possible, a theoretical analysis (details to be decided) → a good network science or math or physical related journal.
- Consider a generalization to integer weights on the edges → facility allocation problem.

Tasks

**Wenruo **

- Upload gr files of the networks used in research to the cloud (see the email).
- Upload the program and user's manual for generating networks with ER, BA, WS, and LZ models.

**Javaria **

- Review those papers that cited the one on Scientific Report. (2024/02/19) Report.
- Generate artificial networks with various models.
- Following the same approach as the paper on Scientific Report, analyze those networks to confirm the phenomenon reported.
- Same approach but with fixed distance k to study the scaling phenomenon with respect to k.
- Compare the running time of Python and C code implementation of the Sieve algorithm.
- Check the maximum capacity of Python code to handle the size of networks within a reasonable time (30 mins).
- Share the memo of tasks and future plans. memo.pdf

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- Studying the scaling behavior size of distance dominating sets with respect to distance, network size, network metrics e.t.c.

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