Research Project GSNS Application Form

EGOR DMITRIEV, Utrecht Univeristy, The Netherlands

1 GENERAL INFO

- Start Date: 15-11-2021 w46
- End date Part 1 (11w): 24-01-2022 w6
- End date Part 2 (18w): 13-06-2022 (13 Jun 2022) w24 +- 1w to ac
- Supervisor: Chekol, Mel (Cheko001)
- Second Examiner: Wang, Shihan (Wang0133)
- Number of credits part 1: 15
- Number of credits part 2: 25

2 PROJECT INFO

- Project Title:
  - Community Detection through Representation learning in Evolving Heterogenous Networks
- Short description of the project, including aims:

Recent developments in big data and graph representation learning have allowed researchers to make breakthroughs in social network analysis and the identification of communities. While opening a lot of research opportunities, such approaches are highly limited to snapshots of rapidly evolving social networks. This, in fact, is a great simplification of the real-world situation which is always evolving and expanding by the user and/or machine interactions.

Relying on novel research of dynamic graph representation learning, the goal of my thesis project is to build a framework for community detection and representation in evolving heterogeneous networks. To verify the merit of the proposed framework, it will be evaluated against baselines on static heterogeneous graphs, and analyzed against gathered twitter dataset on covid measures.

The challenges addressed in this project include but are not limited to the fact that the covered subjects are still novel and under active research. Because of that, there is still no clear consensus for definitions of some important structures such as temporal communities and dynamic networks. Over the course of the project, their definitions need to be thoroughly researched, and compiled from related works and the posed problem of dynamic community discovery in the twitter network. The nature of networks containing multimodal data in the form of node types, edge types, and temporal differences also needs to be addressed and solved appropriately. Finally, the dynamicity of the communities needs to be explored as these communities may emerge, grow, split and fade over time.

3 WORK AND SUPERVISION

Agreements between students and supervisors:

- Total number of hours available for supervision: 12
- Planning/timing of the supervision (e.g. 'weekly meetings'): Biweekly meetings
- Agreed student work load (e.g. full time, 4 days/week, etc.): full time
- Student absence (holidays, courses, etc.): Fri 31st Dec (rest of the holidays fall on weekends)
- Supervisor absence (holidays, conferences, etc.): No holidays planned yet
- Presentations to be held: Thesis Defense

- Lab/group meetings to be attended: N/A