Social Network Analysis – Fall 2021
Final Project

Objective & Overview

- One of the main goals of this course is to prepare you to apply state-of-the-art network analysis tools and algorithms to an application. And of course, to look at new or existing problems from a "network" perspective.

- If you are interested in research, the final project will offer you an opportunity to do exactly this.

- Students can work in teams of up to 3 people.
- There can be the following kinds of course projects:
  - Experimental evaluation of algorithms and models on an interesting dataset.
  - A novel network-oriented approach to an existing problem which hasn't been analysed before from a network perspective.
  - A theoretical project that considers a model, an algorithm or a network property (measure) and derives a rigorous result about it.
  - A scalable implementation of an algorithm for processing massive graphs.
  - A novel way of visualising network data (or subsets thereof).
  - A novel way of visualising processes (dynamic) on a network.
  - Network formation as a result of (game theoretic) game play.
  - Analysis of (game theoretic) game play and equilibria on a network.

- Projects could be a mix of the types of projects outlined above. We expect the project to contain some experimentation on real or synthetic data (even to show validation of a theory). Ideally it should contain some mathematical analysis, unless it completely focusses on visualisation.

- Projects will be evaluated based on:
  - The technical quality of the work:
    - Does the technical material make sense? Are the things tried reasonable? Are the proposed algorithms or applications clever and interesting?
  - Significance
    - Did the authors choose an interesting or a "real" problem to work on, or only a small "toy" problem? If it is a "toy" problem, does it show a new way forward? Is this work likely to be useful and/or have impact?
  - The novelty of the work
    - Do the authors convey novel insight about the problem and/or algorithms?
  - The clarity of the write-up.
  - Degree of difficulty
    - Obviously we will expect more from a 3 member project than a 2 member or a 1 member project.

- Please pick something that you are passionate about! Be brave and propose ambitious things that you're excited about! ☺

- Sample Projects at:
    - https://web.stanford.edu/class/cs224w/projects.html
    - http://snap.stanford.edu/class/cs224w-2016/projects.html

Project Milestones
- **Project Proposal (1-2 pages) September 15th (+ in-class presentation)**
    - What is the problem you are solving?
    - What data will you use (how will you get it)?
    - What work do you plan to do the project?
    - Which algorithms/techniques/models you plan to use/develop?
    - How will you evaluate your method? How will you test it? How will you measure success?
    - What do you expect to submit/accomplish by the end of the semester?
    - Literature Survey – All the relevant prior work that has been done with respect to your chosen problem.

- **Progress Report (3-5 pages) October 20th (+ in-class presentation)**
    - Think of this as a draft of your final report but without your detailed results.
    - We expect that you have completed 50% of the project
    - Provide a complete picture of your project even if certain key parts have not yet been implemented/solved.
    - Include the parts of your project which have been completed so far, such as:
        - Thorough introduction of your problem
        - Review of the relevant prior work
        - Description of the data collection process
        - Description of any initial findings or summary statistics from your dataset
        - Description of any mathematical background necessary for your problem
        - Formal description of any important algorithms used
        - Description of general difficulties with your problem which bear elaboration
    - Make sure to at least outline the parts which have not yet been completed so that it is clear specifically what you plan to do for the final version.

- **Final Report Structure (8-10 pages) November 26th (+ in-class presentation)**
    - Introduction/Motivation/Problem Definition
    - Related Work
    - Model/Algorithm/Method
    - Results and findings
    - Conclusion and Future Work