Final Project: Report and Presentation

Guidelines and Suggested Topics

Networks, Crowds and Markets

Universitat Pompeu Fabra Barcelona

Guidelines

- **Organisation:** The project will be completed in teams of approximately four students from the same seminar group.
- **Topics:** Each team may select one of the topics listed below or propose another topic related to the course. The composition of the group and the selected topic must be communicated by **October 23** (a day after the second tutorial session). If you want to propose a topic, please consult with me ASAP.
- **Structure of the report:**
  - Abstract of the topic discussed (about 0.5 pages).
  - Main discussion and explanation of the chosen topic (6–8 pages).
  - Current or potential applications (1–2 pages).
  - References (at least 5) using a consistent citation style (about 0.5 pages).
- **Deadline:** The report and presentation slides must be uploaded to the course page on *Aula Global* by **November 11**.
- **Presentations:**
  - All team members must participate in the in-class presentation.
  - Presentations will take place on **November 12 and 19**. A detailed schedule will be posted once groups are confirmed.
  - Each team will have **15 minutes** to present.
- **Evaluation:**
  - The project counts for **20%** of the final course grade.
  - **60%** of the project grade is based on the written report.
  - **40%** is based on the presentation: half on individual performance and half on the team's overall quality.
  - Evaluation criteria include: accuracy, depth of content, structure and clarity, presentation quality, use of references, and understanding of the topic.

Suggested Topics

The following are suggested topics and initial references. You are encouraged to explore related literature and examples beyond these starting points.

- **Structural Balance of Social Networks** D. Easley and J. Kleinberg. *Networks, Crowds, and Markets: Reasoning about a Highly Connected World*, Chapter 5.
- **Learning in Networks: Diffusion of Information** D. Easley and J. Kleinberg. *Networks, Crowds, and Markets*, Chapter 19. (Other perspectives on diffusion and adoption processes are also welcome.)
- **Voting** D. Easley and J. Kleinberg. *Networks, Crowds, and Markets*, Chapter 23.
- **Property Rights** D. Easley and J. Kleinberg. *Networks, Crowds, and Markets*, Chapter 24.
- **Graph Neural Networks** C. Bishop and H. Bishop. *Deep Learning*, Chapter 13. See also recent survey articles on graph neural networks and their economic applications.
- **Graphical Models and Belief Propagation: Efficient Probabilistic Inference on Networks** C. Bishop. *Pattern Recognition and Machine Learning*, Chapter 8.
- **Evolving Networks** A.-L. Barabási. *Network Science*, Chapter 6. Online version.
- **Percolation and Network Resilience** M. Newman. *Networks: An Introduction*, Chapter 16.
- **Cascading Failures and Systemic Risk** A.-L. Barabási. *Network Science*, Chapter 8.5. Examples include power-grid blackouts and supply-chain disruptions ("el gran apagón").
- **Kidney Exchange and Market Design** Stanford GSB article A. E. Roth, T. Sönmez, and M. Ü. Ünver. Kidney Exchange (2004). T. Roughgarden. *Twenty Lectures on Algorithmic Game Theory*, Lecture 10.
- **Friendship Paradox: Why Your Friends Have More Friends Than You Do** S. Feld (1991). "Why Your Friends Have More Friends Than You Do." *American Journal of Sociology.*
- **Network Embeddings and Link Prediction** W. L. Hamilton (2020). *Graph Representation Learning.* Morgan & Claypool.
- **Misinformation and Influence Dynamics on Social Media** S. Vosoughi, D. Roy, and S. Aral (2018). "The Spread of True and False News Online." *Science*, 359(6380), 1146–1151.