Reading Group: Social Network Theory

PhD, second year.

Teacher: Fabrizio Panebianco

In the last decades social networks became an important element of social and economic life, and consequently commanded lot of attention from social sciences scholars. Economic theory contributes to the network research program analyzing how strategic reasoning applies to complex social interactions.

Objectives.
This reading group will offer to PhD students insight on how theorists and applied theorists in economics face the main issue of strategic interaction when decision processes analysis has to take into account the complexity of the economic and social environment, described as nodes (economic agents), links (the strategic relationship between any two agents). The goal of the course is to provide the basic toolbox, with insights on the research frontier. The focus in on microeconomics of network with focus on how strategic reasoning has to be shaped in a network, how networks are formed, how behavior and norms evolve and diffuse in a network, with a final look at financial networks.
Given the reading group structure, and the end of the group students should be ready to read, understand, present, and criticize the main contributions.

Prerequisites.
Game theory, microeconomics, and basic linear algebra.

Structure of the reading group.
The reading group is divided in five parts. In the first or the first two meetings the teacher will provide some basics about networks. In each of the other four parts, students will present some papers and discuss them in class.
The final evaluation will depend on class participation and on a final assignment that will be a referee report exercise on a working paper or a published paper on the topics studied in class.

Program

- **Preliminaries.**
  In this first part the teacher will present the main ways a network has been presented in economic theory, the differences between complex and non complex networks, the linear algebra necessary to perform theory on network.

  The list of the papers provided for the following topics is non exhaustive and will be modified depending also on the interests of the students.

- **Network Games.**
  In this part students will present papers that analyze how strategic interaction has been applied to the analysis of games with local and/or global strategic externalities, where local externalities are modeled as social networks.

1. Galeotti, Andrea, et al. "Network games." *The review of economic studies* 77.1 (2010): 218-244.
2. Ballester, Coralio, Antoni Calvó-Armengol, and Yves Zenou. "Who's who in networks. Wanted: The key player." *Econometrica* 74.5 (2006): 1403-1417.
3. Bramoullé, Yann, and Rachel Kranton. "Public goods in networks." *Journal of Economic Theory* 135.1 (2007): 478-494.
4. Bramoullé, Yann, Rachel Kranton, and Martin D'amours. "Strategic interaction and networks." *American Economic Review* 104.3 (2014): 898-930.
5. Lipnowski, Elliot, and Evan Sadler. "Peer-Confirming Equilibrium." *Econometrica* 87.2 (2019): 567-591.
6. Golub, Benjamin, and Stephen Morris. "Expectations, networks, and conventions." *Networks, and Conventions (September 9, 2017)* (2017).
7. Battigalli, Pierpaolo, Fabrizio Panebianco, and Paolo Pin. "Learning and Selfconfirming Equilibria in Network Games." *arXiv preprint arXiv:1812.11775* (2018).

- **Network Formation.**
  In this part of the reading group students will face the problem of network endogeneity. Indeed social network are not fixed and cannot be always taken as given by the theorist. Then there is some literature analyzing how networks are formed.

8. Jackson, Matthew O., and Asher Wolinsky. "A strategic model of social and economic networks." *Journal of economic theory* 71.1 (1996): 44-74.
9. Jackson, Matthew O., and Brian W. Rogers. "Meeting strangers and friends of friends: How random are social networks?." *American Economic Review* 97.3 (2007): 890-915.
10. Currarini, Sergio, Matthew O. Jackson, and Paolo Pin. "An economic model of friendship: Homophily, minorities, and segregation." *Econometrica 77.4* (2009): 1003-1045.
11. Bala, Venkatesh, and Sanjeev Goyal. "A noncooperative model of network formation." *Econometrica* 68.5 (2000): 1181-1229.

- **Diffusion and Learning in Networks.**
  Networks can also be used to analyzed the strategic or non strategic diffusion of information, types, norms, diseases, in a network. In this part students will be provided an insight on this issue.

12. Golub, Benjamin, and Matthew O. Jackson. "Naive learning in social networks and the wisdom of crowds." *American Economic Journal: Microeconomics* 2.1 (2010): 112-49.
13. Golub, Benjamin, and Matthew O. Jackson. "How homophily affects the speed of learning and best-response dynamics." *The Quarterly Journal of Economics* 127.3 (2012): 1287-1338.
14. López-Pintado, Dunia. "Diffusion in complex social networks." *Games and Economic Behavior* 62.2 (2008): 573-590.
15. Molavi, Pooya, Alireza Tahbaz-Salehi, and Ali Jadbabaie. "A Theory of Non-Bayesian Social Learning." *Econometrica* 86.2 (2018): 445-490.
16. Jadbabaie, Ali, et al. "Non-Bayesian social learning." *Games and Economic Behavior* 76.1 (2012): 210-225.

- **Financial Networks**
  As final issue we present a particularly relevant application of networks and diffusion in

finance.

17. Acemoglu, Daron, Asuman Ozdaglar, and Alireza Tahbaz-Salehi. "Systemic risk and stability in financial networks." *American Economic Review* 105.2 (2015): 564-608.
18. Elliott, Matthew, Benjamin Golub, and Matthew O. Jackson. "Financial networks and contagion." *American Economic Review* 104.10 (2014): 3115-53.