

# Decision making and social networks

Dr. Umberto Grandi<sup>1</sup>

<sup>1</sup> University of Padova  
Department of Mathematics  
Email: [umberto@math.unipd.it](mailto:umberto@math.unipd.it)

**Timetable:** 14 hrs. First lecture on June 4, 2013, 11:00 (dates already fixed, see the calendar), Torre Archimede, Room 2BC/30.

**Course requirements:** I will assume some basic knowledge of computational complexity theory. Acquaintance with classical theories of decision making (e.g., game theory, social choice theory) could be of help.

**Examination and grading:** Oral presentation and final paper.

**SSD:** INF/01 - Computer Science

**Aim:** Perhaps one of the most important aspects influencing individuals in making decisions can be identified in the social network structure in which they are organised. Researchers in artificial intelligence and multi-agent systems have recently started borrowing models from economic theory to study societies of interacting agents. The next step of this process may add a computational taste to the vast literature on social and economic networks in an effort to design the computational social processes of the future. This course aims at getting an overview of current research in computer science on this topic, providing a solid introduction to classical theories of decision making and social network analysis.

**Course contents:** The course will be structured in three parts. In the first two parts I will provide an introduction of two topics that have received considerable attention by the community of artificial intelligence in recent years: theories of decision making on the one hand, and social network analysis on the other. Topics will include basic concepts in game theory and social choice theory, fundamentals of network analysis and models of network formation. In the second part of the course each student will present a research paper that combines the two aspects presented in the first part of the course: decision making and social networks. A list of such papers will be available on-line before the start of the course. Each student will then write a final paper on the chosen research topic.

Suggested readings and on-line material include:

- I. Gilboa, *Rational Choice*. MIT Press, 2010.
- M.O. Jackson, *Social and Economic Networks*. Princeton University Press, 2008.
- <http://www.coursera.org/course/sna>
- <http://wids.lids.mit.edu/>