SOE 10: Focus Session: Experimental Methods

Time: Tuesday 13:30–15:30 Location: GÖR 226

Invited Talk SOE 10.1 Tue 13:30 GÖR 226
Complex Economic Systems in the Laboratory — •Cars Hommes — University of Amsterdam, Netherlands

Expectations and learning play a key role in complex economic systems. In this talk we survey learning to forecast experiments (LtFEs) with human subjects to test theories of expectations and learning. Subjects must repeatedly forecast a market price, whose realization is an aggregation of individual expectations. Emphasis is given to how individual forecasting rules interact at the micro level and which structure they co-create at the aggregate, macro level. In particular, we focus on the question wether the evidence from laboratory experiments is consistent with heterogeneous expectations in complex economic systems.

Invited Talk SOE 10.2 Tue 14:00 GÖR 226
Multiplicative Cascades: How to model trip within cities — •Marta C. González — Massachusetts Institute of Technology, Boston, USA

Our work focuses on developing a model for trip lengths distribution in metropolitan areas, in which the current tendency is set by gravity like models, where trip lengths are fit with empirical OD (origin destination) data. While it is an extensively used method, its main drawback is that it lacks a way to include the spatial statistical variations of population density and services into the model. Depending on fit parameters for a particular region and a particular spatial scale without providing an understanding in the values of the used parameters. As we show in this paper, multiplicative cascade models can be used to generate heterogeneous distribution of populations that compare very well with the best-known resolution data as provided by LandScan. We proposes analytical expressions for trip length distributions that contain the multiplicative cascade parameters obtained from empirical density of population and allows to be adjusted to different scenarios of supply distribution. We present an extensive sensitivity analysis providing an insight in how the shape of the trip length distribution changes on different scenarios.

Invited Talk SOE 10.3 Tue 14:30 GÖR 226
Human behavior on networks: lessons and perspectives from game theory — Jelena Grujic[1], Constanza Fosco[1,4], Lourdes Araujo[5], José A. Cuesta[1], and •Angel Sánchez[1,2,3] — [1]GISC/Matemáticas, Universidad Carlos III de Madrid, Spain — [2]ICMAT, CSIC-UAM-UC3M-UCM, Madrid, Spain — [3]BIFI, Universidad de Zaragoza, Spain — [4]Economía, Universidad Católica del Norte, Antofagasta, Chile — [5]NLP-IR/Lenguajes y Sistemas, UNED, Madrid, Spain

One of the most often invoked mechanisms to explain how cooperation can emerge is the existence of a population structure that determines the interactions among individuals. We present results of the first experiment designed to test the emergence of cooperation when humans play Prisoner's Dilemma on a network whose size is comparable to that of simulations. We find that cooperation is not sustained by the network: the cooperation level declines to an asymptotic state with low but non-zero cooperation. Regarding players' behavior, we observe that the population is heterogeneous, consisting of a high percentage of defectors, a smaller one of cooperators, and a large group that shares features of the conditional cooperators of public goods games. We do not observe significant learning as the experiment progresses. We propose a computational model showing that both heterogeneity and a "moody" conditional ooperation strategy, in which the probability of cooperating also depends on the player's previous action, are needed to explain all our experimental results.

Invited Talk SOE 10.4 Tue 15:00 GÖR 226
Measuring Happiness — •Peter S. Dodds — University of Vermont, Burlington, USA

Individual happiness is a fundamental reflection of societal health. Normally measured through self-report, happiness has often been indirectly characterized and overshadowed by more readily quantifiable economic indicators, such as gross domestic product. In this talk, I will provide motivation for measuring well-being online through non-invasive observation, as a complement to traditional survey methods, and I will outline recent 'big data' efforts that have extracted emotional content from written expression. I will report in particular on a real-time, remote-sensing, non-invasive, text-based approach—a kind of hedonometer—which we have used to uncover collective dynamical patterns of happiness as expressed in the global social network Twitter, song lyrics, blogs, political speeches, and news sources. I will report on global levels of temporal, spatial, demographic, and social variations in happiness and information levels, as well as evidence of emotional synchrony and contagion. I will employ a particular graphical method to show how individual words contribute to changes in average happiness between any two texts. Finally, I will also discuss how natural language appears to contain a frequency-independent positive bias, and how this connects to collective cooperation and evolution.