9th Conference of the European Social Simulation Association

Tuesday, September 17, 2013, 9:00-9:45

Keynote presentation:

Social influence and social transitions: Computational model and empirical data

Andrzej Nowak

In recent times social change is ever-present. We concentrate on internally driven rapid social transitions, fast changes that originate within social systems. Social influence plays a crucial role in such changes; individual's attitudes and behaviors depend on the social context of the individual. Dynamical theory of social impact (Nowak at all 1990, Lewenstein, Nowak Latane' 1993) specifies how influences of many sources on a target combine. Social influence is proportional to the strength of the source and proximity between the source and the target. When minority has stronger influence than majority, social change may occur.

Computer simulations, experimental studies, case studies, and analysis archival datasets show that internally generates social transitions follow a scenario similar to phase transition in physics: bubbles (clusters) of new appear in the sea of old, expand and connect to each other. These clusters correspond to local pockets of coherent reality such as, belief systems or local culture. Individual differences in strength of influence, non-linearity of change rules, and structure of social contacts are the main factors deciding about how the change appears.

During change we can observe double social reality with the new reality inside the growing clusters and the old outside clusters. Both the new reality and the old reality involve many dimensions.

The theory was tested on the economic, social and political data concerning Poland between 1989 and 2004. Economic activity, measured "per capita" before the transition was equally spread throughout Poland. As the transition occurred, in 1991 suddenly strong centers of growth appeared in several locations, where the average level of education was the highest. Further economic growth was occurring as the clusters of economic growth were broadening. . The change involved many areas of social life expressed in voting patterns, attitudes toward EU and many others. Data reveal also the influence of historical factors and dissipation of economic activity across the Western border of Poland.

In time the pattern of economic change follows a J curve, where the initial exponential decay of the old economy is followed by the exponential growth of the new economy. Such a pattern of economic change is characteristic for all the countries of the former Soviet block.

9th Conference of the European Social Simulation Association

Wednesday, September 18, 2013, 9:00-9:45

Keynote presentation:

Towards Simulating the Foundations of Society

Dirk Helbing

In order to understand social systems, it is essential to identify the circumstances under which individuals spontaneously start cooperating or developing shared behaviors, norms, and culture.

In this connection, it is important to study the role of social mechanisms such as repeated interactions, group selection, network formation, costly punishment and group pressure, and how they allow to transform social dilemmas into interactive situations that promote the social system.

Furthermore, it is interesting to study the role that social inequality, the protection of private property, or the on-going globalization play for the resulting "character" of a social system (cooperative or not). It is well-known that social cooperation can suddenly break down, giving rise to poverty or conflict. The decline of high cultures and the outbreak of civil wars or revolutions are well-known examples. The more surprising is it that one can develop an integrated game-theoretical description of phenomena as different as the outbreak and breakdown of cooperation, the formation of norms or subcultures, and the occurrence of conflicts.

9th Conference of the European Social Simulation Association

Thursday, September 19, 2013, 9:00-9:45

Keynote presentation:

Full-scale models:
What can be learned from studying entire economies computationally?

Robert Axtell

Conventional economic analysis builds equilibrium models with a representative agent or run regressions on aggregate data. Such approaches might overlook consequence of agents' heterogeneity, bounded rationality, interaction and coordination mechanisms as well as institutional environment, such as household or financial markets.

In order to overcome these methodological shortcomings, full-scale agent-based model is proposed as an alternative, that is, a model in which one tries to simulate the behavior of literally every household in the economy and includes important ingredients of economy such as financial or household markets.

Agent-based modeling proved its usefulness in many disciplines, e.g. ecology, epidemiology, simulating traffic, military operational research as well as forecasting prepayment rates for tens of millions of individual mortgage, predicting the influence of tick size change on a stock exchange market or replicating many financial artifacts such as heavy-tailed firm size or clustered volatility on financial markets.