

Kathleen Carley

Title:

Diffusion in the Social-Cyber Landscape: Using simulation to explore the link between off-line and on-line activity

Abstract:

We exist in a social-cyber landscape. New ideas are created and spread both off-line and on-line; and increasingly, the information that we have about that spread is captured only on-line through social media. Generally, the most touted aspects of on-line information diffusion are that: information can go viral more quickly, information can spread to a wider audience, and there is less time to respond to errors in such information. However, less is known about how this cyber connection influences and impacts the off-line reality. Using a series of empirically driven simulations an argument is built that diffusion in a social-cyber landscape alters the fabric of the off-line world. As a result expectations about who or what is important may be wrong, and the process of community building may be altered.

The journey begins by using a simple agent-based model to explore how the two elements of on-line communication speed and storage influence who gets information first. Then turning to a corporate setting simulation is used to assess how the NextGen system, with its movement from physical to digital communication, might impact air-traffic control. Then simulation is used to assess the potential for conflict associated with the Arab Spring, given a social-cyber landscape. Finally, a simulation instantiated using Twitter data is used to forecast the movement of people given Tsunami warnings. These examples illustrate both the value of digital data to simulation, and how simulation can be used to create new theories and better understandings of human behavior in a cyber mediated landscape.

Blake LeBaron

Title:

Self-generating Economic Forecast Heterogeneity

Abstract:

Analysis of complex systems force us into a deeper understanding of heterogeneity. In economics and finance this heterogeneity often appears in the form of individual forecasts. This talk will demonstrate how a simulated agent-based financial market generates, at at times magnifies, the dispersion in individual forecasts. The results are compared with data from several individual survey forecasts along with information on trading volume. Since agent-based models' key feature is their ability to generate heterogeneity, then testing them against individual forecasting data is crucial. Finally, the connection of heterogeneity to overall price dynamics and system stability (bubbles and crashes) will be discussed both for financial markets, and other aspects of the macro economy.

Arnout van de Rijt

Title:

Models of cumulative advantage

Abstract:

Cumulative advantage is the expectation that the deck is stacked in favour of those who were previously successful. Cumulative advantage has been of interest to social scientists because it may explain (1) why who or what is successful in a given context need not be of high quality, and (2) why the distribution of success across a population of people or things is often highly unequal. I claim that simulation models of cumulative advantage suggest that the conditions under which (1) and (2) happen are more restrictive than generally thought. I also provide empirical evidence from a range of contexts pertaining to this claim.

Michael Macey

Title:

Predicting Unpredictability

Abstract:

The ability to predict is the litmus test of scientific knowledge, yet little is known about social contagions with unpredictable cascade dynamics. Theoretical models show how path dependence and positive feedback can generate large group differences in opinion whose direction and magnitude can nevertheless be highly sensitive to random variation in the initial conditions. Although large differences are more predictable across multiple samples from the same realization, large differences may be especially susceptible to inconsistency across multiple realizations from random starting points.