'Direct and indirect reciprocity in dynamic social networks: a data-mining approach'

Date(s) Tuesday 8th January 2013 (16:00-17:00)**Download**Add to Calendar

Speaker: Dr. Steve Phelps, University of Essex

Many models of social network formation implicitly assume that network properties are static in steady-state. In contrast, actual social networks are highly dynamic: allegiances and collaborations expire and may or may not be renewed at a later date. Moreover, empirical studies show that human social networks are dynamic at the individual level but static at the global level: individuals' degree rankings change considerably over time, whereas network level metrics such as network diameter and clustering coefficient are relatively stable. There have been some attempts to explain these properties of empirical social networks using agent-based models in which agents play social dilemma games with their immediate neighbours, but can also manipulate their network connections to strategic advantage. However, such models cannot straightforwardly account for reciprocal behaviour based on reputation scores ("indirect reciprocity"), which is known to play an important role in many economic interactions. In order to account for indirect reciprocity, we model the network in a bottom-up fashion: the network emerges from the low-level interactions between agents. By so doing we are able to simultaneously account for the effect of both direct reciprocity (e.g. "tit-for-tat") as well as indirect reciprocity (helping strangers) in order to increase one's reputation). We test the implications of our model against a longitudinal dataset of Chimpanzee grooming interactions in order to determine which types of reciprocity, if any, best explain the data. We discuss the importance of the temporal and micro-properties of the data in analysing reciprocity: in particular determining the length of window over which direct recprocity occurs, and the importance ofnetwork-motifs in detecting patterns of indirect reciprocity.

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