

Michaelmas Term 2008

CABDyN SEMINAR SERIES
Saïd Business School, University of Oxford



Convenors:

Felix Reed-Tsochas, *James Martin Institute, Saïd Business School*

Eduardo López, *Saïd Business School*



Our meetings intend to provide a forum for rigorous research (in a broad range of disciplines) focusing on complex adaptive systems, using methods and techniques such as agent-based modelling and complex network analysis. Since potential areas of application for such approaches can be located across the social, natural and engineering sciences, our aim is to involve participants from a wide range of departments in Oxford. We welcome talks which focus on particular areas of application and associated technical issues, but also encourage contributions which address more fundamental conceptual or mathematical problems. The CABDyN Seminar Series is one of the activities of the CABDyN Complexity Centre (<http://sbs-xnet.sbs.ox.ac.uk/complexity/>).

Tuesday 14th October, 12.30 – 2.00 pm

Seminar Room B, Saïd Business School

Dr Felix Reed-Tsochas
James Martin Institute, Oxford Saïd Business School

‘A model of cooperation for bipartite networks’

ABSTRACT

The results that I will be discussing in this talk are the outcome of a 3-year research project, which started by focusing on the network of manufacturer-contractor relationships in the New York garment industry over a period of almost 20 years, using a dataset of 700,000 transactions. The aim was to understand how the key structural and functional characteristics of the network change over time, and what mechanisms might make the topology of such a shrinking network robust.

In trying to understand some of the more detailed structural characteristics of this network, we took inspiration from simple stochastic models in theoretical ecology, which have a successful track record of accounting for the overall properties of consumer-resource interactions in real food webs. Of course, since the network of manufacturers and contractors in the New York garment industry consists of two distinct classes of firms engaged in collaborative co-production, standard food web models in their original form do not provide an appropriate starting point. The bipartite co-operation model that we propose is a simple stochastic model which generates co-operative relationships between two distinct sets of actors, starting from three empirical input parameters. It not only accounts for the observed structural features of the manufacturer-contractor network, but also is able to reproduce the structure of plant-animal mutualistic networks obtained from ten empirical pollination datasets. The bipartite co-operation model may therefore provide an explanation for the surprising similarity that we observe for certain organisational and ecological networks, and is likely to apply to other systems as well.

References:

Serguei Saavedra, Felix Reed-Tsochas and Brian Uzzi (2008), "Asymmetric disassembly and robustness in declining networks", *Proceedings of the National Academy of Sciences*, in press.

Serguei Saavedra, Felix Reed-Tsochas and Brian Uzzi (2008), "A simple model of bipartite cooperation for ecological and organizational networks", *Nature*, in press.

Sandwiches and drinks will be provided

For further information contact info.cabdyn@sbs.ox.ac.uk

Seminar webpage: http://sbs-xnet.sbs.ox.ac.uk/complexity/complexity_seminars.asp