

Hilary Term 2008

CABDyN SEMINAR SERIES
Saïd Business School, University of Oxford



Convenors:

Felix Reed-Tsochas, *James Martin Institute, Saïd Business School*
Jukka-Pekka Onnela, *Physics Department & 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 Research Cluster (<http://sbs-xnet.sbs.ox.ac.uk/complexity/>).

Tuesday 4th March, 12.30 – 2.00 pm

JMI Seminar Room, Saïd Business School

Dr Rich Williams
European Science Initiative
Microsoft Research Ltd

‘Neutral degree distributions in complex food webs’

ABSTRACT

Degree distributions, or the distribution of fraction of nodes in a network with a particular number of links, have long played a central role in the description and interpretation of the structure of complex networks, including food webs. Food webs are directed networks of links between consumer and resource species and so it is informative to consider the distribution of numbers of prey and predators separately. The distributions of the number of prey in 42 (82%) of 51 food webs and of the number of predators in 30 (59%) of 51 food webs are not significantly different from the maximum entropy (Maxent) distribution constrained only by the numbers of species, resources or consumers and links in the food webs. In addition, the prey distributions of niche model and nested hierarchy model networks closely follow Maxent distributions but their predator distributions differ greatly from both Maxent distributions and the empirical distributions, particular at high mean connectivity (links per species). These findings offer a simple null model for the predator and prey distributions in complex food webs. They suggest that there is relatively little ecological pressure favouring generalist versus specialist consumption strategies and that there is more (though still limited) pressure driving the distribution of the number of predators away from the Maxent distribution. They also show that leading structural models of food webs describe predator distributions very poorly.

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