SAID BUSINESS SCHOOL, University of Oxford

Summer Seminar

Convenors: Felix Reed-Tsochas, Institute for Science, Innovation and Society, Saïd Business School
Eduardo López, Saïd Business School

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Seminar webpage: www.cabdyn.ox.ac.uk/complexity_seminars.asp

Please note: although the seminar programme detailed was correct at time of printing, seminar arrangements are subject to change – for the latest information, please check the seminar webpage.

Thursday 22nd July

2.00pm Barclay Room, Green Templeton College

Assistant Professor Ginestra Bianconi,
Department of Physics, Northeastern University

'*The entropy of network ensembles: theory and application to inference problems.*'

ABSTRACT

In this talk we define a new quantify for the study of complex networks: the entropy of network ensembles. This quantify is able to quantify the level of order present in complex networks by statistical mechanics methods. The calculation of this quantity has various theoretical implications. In particular we will show that scale-free networks have much smaller entropy than random graphs. This provides some fundamental argument in favour of the idea scale-free networks is a result of a non-equilibrium process. The entropy of random network ensemble can be also used for inference problems. In particular we will show how we can construct an entropy based indicator able to assess the relevance of features on a network. This indicator provides a universal answer to the problem, free from the information bounds present on feature detection algorithms, and is able to reveal hidden statistical regularities of networks with communities and networks embedded in a metric space.

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