SAID BUSINESS SCHOOL, University of Oxford

SEMINAR SERIES / TRINITY 2010

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

Sandwiches and drinks will be provided

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.

Tuesday 25th May
(12.30 – 2.00pm) James Martin Seminar Room

Prof Alexandre Arenas
Department of Computer Sciences and Mathematics, Universitat Rovira i Virgili, Tarragona

'Optimal Map of the Modular Structure of Complex Networks'

ABSTRACT

Modular structure is pervasive in many complex networks of interactions observed in natural, social and technological sciences. Its study sheds light on the relation between the structure and function of complex systems. Generally speaking, modules are islands of highly connected nodes separated by a relatively small number of links. Every module can have contributions of links from any node in the network. The challenge is to disentangle these contributions to understand how the modular structure is built. The main problem is that the analysis of a certain partition into modules involves, in principle, as many data as number of modules times number of nodes.
To confront this challenge, here we first define the contribution matrix, the mathematical object containing all the information about the partition of interest, and after, we use a Truncated Singular Value Decomposition to extract the best representation of this matrix in a plane. The analysis of this projection allow us to scrutinize the architecture of the modular structure, revealing the structure of individual modules and their interrelations.

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