SAID BUSINESS SCHOOL, University of Oxford

SEMINAR SERIES / MICHAELMAS 2011

Convenors: Felix Reed-Tsochas, Institute for Science, Innovation and Society, Saïd Business School
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Seminar webpage: www.cabdyn.ox.ac.uk/complexity_seminars.asp

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 1st November

(12.30pm – 2.00pm) James Martin Seminar Room

Prof David Sumpter
Collective Behaviour Group, Department of Mathematics, Uppsala University

'Quantifying social dynamics: from trapped prawns, to shoaling fish and clapping humans'

ABSTRACT

Research on the collective behaviour of animals has increased rapidly over recent years, attracting attention both in the popular media and from scientists from a wide variety of different disciplines. The basic research question is how individuals interact to produce collective patterns, on a scale far larger than the size of a single individual, in the absence of any centralised control. Ant trail networks, locust swarms, bird flocks, fish schools and human crowds are all key examples. Answering this question involves mathematical modelling, where computer simulations appear to show how collective patterns emerge. As research in this area intensifies, more rigorous standards are needed to validate these models against reality. It is not sufficient to simply run a model and say that it 'looks like' a bird flock or a fish school. In this talk I will present recent work in which we use automated tracking data to quantify how fish and prawns interact with each other, and show how these interactions produce collective motion. I will also present examples of social behaviour in humans, namely gaze-following and audience clapping. These studies show that, by linking global universal patterns to detailed observations of behaviour, we obtain often surprising insights in to the simplicity of how individuals interact with each other and the complexity of the patterns they produce.

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