



SAID BUSINESS SCHOOL, University of Oxford

## SEMINAR SERIES / HILARY 2011

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](http://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 8<sup>th</sup> February**  
(12.30 - 2.00pm) James Martin Seminar Room

### Dr Felix Reed-Tsochas

James Martin Lecturer in Complex Systems and CABDyN Co-Director, Saïd Business School, University of Oxford

## 'Innovation adoption in an online social network' [with Jukka-Pekka Onnela]

### ABSTRACT

This talk is based on a recent paper with Jukka-Pekka Onnela on social influence and the spread of innovations in an online environment. Our research is especially motivated by two different strands of research. First, the work by Salganik, Dodds and Watts (2006) on social influence in cultural markets, again in an online context. Second, a long tradition of research on the diffusion of innovations in spatial regions or social networks (e.g. Coleman, Katz and Menzel 1957). We choose an online context (Facebook) that allows us to track the popularity of a complete set of applications installed by the user population of a social networking site. This allows us to capture the behaviour of all individuals who can influence each other in this particular context. This setting also has the advantage that it allows us to follow the evolution of both popular and unpopular application, thus avoiding one key source of selection bias that could skew our findings. We analyse the collective behaviour of the potential user population by extending standard fluctuation scaling methods, and are able to show that two distinct regimes of behaviour emerge. Once applications are above a particular threshold of popularity, social influence processes appear to induce highly correlated adoption behaviour among the users. This propels some of the applications to extraordinary levels of popularity, but also increases volatility. Below this threshold, the signature of social influence in collective behaviour seems to vanish almost entirely. By constructing a synthetic time series of the application installations, we can show that the empirically observed behaviour in the two different regimes can be understood in terms of the differing effects of local and global mechanisms. Time permitting, I will discuss the possibility of testing a microscopic model that can generate some of the observed features, and some preliminary results obtained by applying fluctuation scaling techniques to other online datasets.

Jukka-Pekka Onnela and Felix Reed-Tsochas (2010). Spontaneous emergence of social influence in online systems, *Proceedings of the National Academy of Sciences* **107** (43), 18375-18380.

