

NYU Stern School of Business
Department of Information, Operations & Management Sciences
STATISTICS RESEARCH SEMINAR

TOPIC: Understanding the Behaviour of Large Networks

SPEAKER: Patrick Wolfe (University College London)

DATE: Friday, April 10, 2015

TIME: 11:30 AM - 12:30 PM

PLACE: KMC 4-80

Abstract

In this talk – which will be accessible to a general audience – we show how the asymptotic behavior of random networks gives rise to universal statistical summaries. These summaries are related to concepts that are well understood in the other contexts outside of Big Data – such as stationarity and ergodicity – but whose extension to networks requires recent developments from the theory of graph limits and the corresponding analog of de Finetti’s theorem. We introduce a new tool based on these summaries, which we call a network histogram, obtained by fitting a statistical model called a blockmodel to a large network. Blocks of edges play the role of histogram bins, and so-called network community sizes that of histogram bandwidths or bin sizes. For more details, see recent work in the Proceedings of the National Academy of Sciences (doi:10.1073/pnas.1400374111, with Sofia Olhede) and the Annals of Statistics (doi:10.1214/13-AOS1173, with David Choi).

Bio

Patrick J. Wolfe is Professor of Statistics and Honorary Professor of Computer Science at University College London, where he is a member of the Department’s Senior Management Team and a Royal Society and EPSRC Established Career Research Fellow in the Mathematical Sciences.

From 2001-2004 he held a Fellowship and College Lectureship in Engineering and Computer Science at Cambridge University, where he completed his PhD in 2003 following a National Science Foundation Graduate Fellowship. Prior to joining UCL he was Assistant (2004-2008) and Associate (2008-2011) Professor at Harvard University, where he received the Presidential Early Career Award for Scientists and Engineers from the White House.

Professor Wolfe currently serves as Executive Director of the UCL Big Data Institute. Externally to UCL, he serves on the editorial board of the Proceedings of the Royal Society A (Mathematical, Physical & Engineering Sciences), the Research Section Committee of the Royal Statistical Society, the Program Committee of the 2015 Joint Statistical Meetings, and as an organizer of the 2016 Newton Institute program on Theoretical Foundations for Statistical Network Analysis.