

CABDyN / INET Oxford SEMINAR SERIES

Keble College - Hilary 2014

For further information
please contact the
Cabdyn Administrator:

info.cabdyn@sbs.ox.ac.uk

01865 288785

Seminar webpage:
[www.cabdyn.ox.ac.uk/
complexity_seminars.
asp](http://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.

‘Network histograms and universality of blockmodel approximation’

Sofia Olhede

Professor of Statistics, Honorary Professor of Computer Science
University College London

Tuesday 18th February, 12.30 -14.00

Roy Griffiths Room (ARCO), Keble College

ABSTRACT:

A network histogram is obtained by fitting a stochastic blockmodel to a single observation of a network dataset. Blocks of edges play the role of histogram bins, and community sizes that of histogram bandwidths or bin sizes. Just as standard histograms allow for varying bandwidths, different blockmodel estimates can all be considered valid representations of an underlying probability model, subject to bandwidth constraints. We show that under these constraints, the mean integrated square error of the network histogram tends to zero as the network grows large, and we provide methods for optimal bandwidth selection-thus making the blockmodel a universal representation. With this insight, we discuss the interpretation of network communities in light of the fact that many different community assignments can all give an equally valid representation of the network. To demonstrate the fidelity-versus-interpretability tradeoff inherent in considering different numbers and sizes of communities, we show an example of detecting and describing new network community microstructure in political weblog data.

This is joint work with Patrick Wolfe - UCL