



UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

Friday, 2 May 2008, 2.00pm

Carslaw 375

## Multiscale density estimation

**Marc Raimondo**  
(University of Sydney)

### **Abstract**

Most statistical software packages produce density estimate using a single smoothing parameter chosen in some data-driven fashion. While this may be suited to simple scenarios where data features can be described with a monoscale representation such estimation method fails to capture non-homogeneous data distribution. In theory, this problem can be solved by using a locally-varying smoothing parameter but practical implementation of such a paradigm is difficult, computationally expensive and often numerically unstable. In this talk, we will present an adaptive method for multiscale density estimation. The algorithm is implemented in the Fourier domain and yields shift-invariant non-linear wavelet approximations of Meyer type. The method naturally extends to contaminated data model where observations are subject to measurement errors. We illustrate the adaptiveness properties of our estimator with a range finite sample examples.

Enquiries about the Statistics Seminar should be directed to  
Jean Yang ([jeany@maths.usyd.edu.au](mailto:jeany@maths.usyd.edu.au))