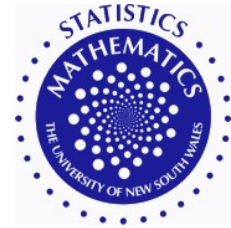


# Statistics seminar series

THE UNIVERSITY OF  
NEW SOUTH WALES



University of New South Wales  
Session 1, 2006



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**Marc Raimondo**

School of Mathematics and Statistics  
The University of Sydney

## Wavelet deconvolution with noisy eigen-values

Over the last decade there has been a lot of interest in wavelet-vaguelette methods for the recovery of noisy signals or images in motion blur. Non-linear wavelet estimators are known to have good adaptivity properties and to outperform linear approximations over a wide range of signals and images, see e.g. the recent **WaveD** method of Johnstone, Kerkycharian, Picard and Raimondo. In the de-blurring setting wavelet-vaguelette methods rely on the complete knowledge of a convolution operator's eigen-values. This is an unlikely situation in practice, however. A more realistic scenario, such as would arise when passing the Fourier basis as an input signal through a Linear-Time-Invariant system, is to imagine that one also observes a set of noisy eigen-values. In this paper we show the **WaveD** estimator is near-optimal when used with noisy eigen-values. A key feature of our method is to threshold the noisy Fourier coefficients according to the wavelet frequency bands. Asymptotic theory is illustrated with a wide range of finite sample examples.

This is a joint work with Laurent Cavalier (Université Aix-Marseille 1)

**About the speaker:** Marc Raimondo is a statistics lecturer at the University of Sydney. Marc's research interests include change-point models, image processing, wavelet filtering and curve estimation. He is active in producing computer software to implement his new methodologies.

**Time:** 4pm, Wednesday, 8th March

**Location:** Room 4082, Red Centre

Please join us after the seminar for wine and cheese in the staffroom.

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