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**Joint Seminar STAT/ULB**

*"Tree-structured wavelet estimation with application  
to mixed effects modelling"*

**Friday, March 13, 2009**

**14:30**

**ULB - Campus PLAINE - Bâtiment NO/Building  
Etage/Floor 9**

**Abstract**

Wavelet thresholding has been proven to be a powerful technique for nonparametric function estimation when the underlying curve shows inhomogeneous spatial structure. However, in situations of low signal-to-noise ratio, it is possible to improve this denoising technique by imposing a tree-structure on the thresholded wavelet coefficients. In this talk, we first try to give some general empirical insights into this methodology before we apply a particularly simple instance of tree-structured wavelet thresholding to nonparametric regression within a functional mixed effects model. Here our aim is to both estimate the common ("population") curve (i.e. the fixed effect) and its variability (due to the random effect) and to construct suitable predictors of the random effect curves. Numerical examples in the context of spectral density estimation of replicated time series confirm the good performance of our method despite its simplicity.

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