Speaker: Dr Stephane Heritier
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Date: Tuesday 27th May, 2008 Time: 2 - 3pm
Venue: E4A523 (level 5 seminar room)

Title: New robust alternatives to the F-test in mixed linear models

Abstract:
Mixed linear models are commonly used to analyze data in many settings. These models are generally fitted by means of (restricted) maximum likelihood techniques relying heavily on normality. The sensitivity of the resulting estimators and related tests to this underlying assumption has been identified as a weakness that can even lead to wrong interpretations. Very recently a highly robust estimator based on a scale estimate, i.e. an S-estimator, has been proposed for general mixed linear models. It has the advantage of being easy to compute and allows the computation of a robust score test. However this proposal cannot be used to define a likelihood ratio type test which is certainly the most direct route to robustify an F-test. As the latter is usually a key tool of hypothesis testing in mixed linear models, we propose two new robust estimators that allow the desired extension. They also lead to resistant Wald-type tests useful for testing contrasts and covariate effects. We study their properties theoretically and by means of simulations. The analysis of a real data set illustrates the advantage of the new approach in the presence of outlying observations.

(Joint work with Samuel Copt.)