Working Group on Statistical Learning Seminar

Title: Non–Intrusive Inference for Stochastic Simulators

Speaker: Vincent Garetta (Trinity College Dublin)

Date: Fri 10th June 2011 at 1:00PM

Location: Statistics Seminar Room– L550 Library building

Abstract: We review three methods of inference which do not require the computation of the likelihood but only the simulation of new data from the model; we describe these methods as non–intrusive. This is useful when the statistical model is available in the form of a computer model, seen as a black box "stochastic simulator". There is therefore no direct access to a "likelihood". Typically such simulators involve the implicit integration over very many variables that are internal to the simulator and are thus latent. The methods are: (i) Indirect inference, (ii) Approximate Bayesian computation and (iii) Emulation.

These methods have emerged in different fields of science and at different times, but they are very close in practice. In contrast to standard 'likelihood–based inference', classical or Bayesian, such methods require estimation of the likelihood from a necessarily finite number of simulations. This "extra- likelihood" estimation means that these methods are only an approximation to likelihood–based methods, were the likelihood to be available. Adopting a common formalism, we show similarities of practice and differences of interpretation underpinning these methods.