School of Mathematics & Statistics

Invites you to a presentation

by

Associate Professor Philippe Lauret

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You are invited to a presentation by

A/Prof Philippe Lauret

Date: **Friday 30 January 2009**

Time: **12:00 – 13:00**

Venue: Building Q1-01, Mawson Lakes Campus

Biography

A/ Professor Lauret has been working with A/Professor Boland and Dr Barbara Ridley within the School of Mathematics and Statistics since his arrival at the University in August 08 and will conclude his visit in February 09.

Title: Bayesian inference : a new statistical method for building models

Abstract

Bayesian probability theory is currently experiencing an increase in popularity in the sciences as a means of probabilistic inference. In the Bayesian context, a probability represents a degree-of-belief (or encodes a state of knowledge); that is, how likely something is to be true based on all the relevant information at hand. In other words, in the Bayesian context, a probability evaluates (quantitatively) the veracity of a hypothesis and this on the basis of all the available information. The name given to this approach comes from the key-role played by Bayes's theorem. The latter is used to update the probabilities in the light of new data. Thus, the Bayesian approach is very close to the scientific reasoning. Indeed, from a set of initial hypothesis, we carry out observations which enable us to deduce (or to infer) other conclusions or to update our initial beliefs.

Bayesian methods can be used either for model selection problems or for parameter estimation problems.

Bayesian data analysis usually requires numerical methods for calculating the probabilitiy distributions of interest. In this seminar, we will discuss about Monte Carlo methods. Indeed, progress in Bayesian posterior computation is due undoubtedly to Markov Chain Monte Carlo (MCMC) methods. We will focus partcularly on the statistical software package WinBUGS. WinBUGS (for Bayesian Inference Using Gibbs Sampling) is an easy-to-learn and easy-to-use software that implements the Gibbs sampler for generating samples from a Markov Chain.

Finally, the derivation of a solar diffuse radiation model in a Bayesian framework will illustrate this statistical method.