



Working Group on Statistical Learning Seminar

Title: Agent Based Models in the Social Sciences

Speaker: Petra Ahrweiler

Date: Tue 10th May 2011 at 1:00PM

Location: Statistics Seminar Room- L550 Library building

Abstract: Agent-based models (ABM) are built from 'the bottom-up', focusing mostly on micro behaviour, and seek to understand the emergence of macro behaviour. This approach is a natural representation of large dynamic populations of heterogeneous agents, and provides a way to study the system's trajectory in time. Consequently, agent-based modelling and simulation is especially suited for the modelling of complex social systems. This is the reason why the methodology has been gaining ground in various disciplines of the social sciences, such as sociology, economics and political science. ABM in effect allows for the creation of artificial societies, that is, agent-based models to build possible social worlds. In artificial societies social structure and group behaviour emerges from the interaction of individuals, under rules that place only bounded demands on each agent's information and computational capacity. Artificial societies are laboratories where social phenomena can be grown 'in silico' (i.e., in the computer). The aim is "to discover fundamental local or micro mechanisms that are sufficient to generate the macroscopic social structures and collective behaviours of interest" (Epstein and Axtell, 1997). On the one hand, ABM is applied to reflect the complex dynamics of real-world social systems and in particular to reflect the evolution of these systems over time as a result of agent behaviour and interaction. However, on the other, the intent is not to predict the future, but rather to represent a range of possible futures that would result from particular agent behaviours. It is

about identifying “desirable futures” and using ABM to determine which individual and collective behaviours may lead to them. This knowledge can then be used to identify policies and policy instruments which would encourage the behaviours that lead towards preferred futures (and/or discourage behaviours have been demonstrated to lead to undesirable futures). This talk will introduce this use of ABM in the social sciences using the example of knowledge-based industries from the field of economics.