

NSF/ESRC Agenda Setting Workshop on Agent-Based Modeling of Complex Spatial Systems: April 14-16, 2007

A Personal Perspective on Agent-Based Modelling of Complex Spatial Systems

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Introduction

As a computational geographer, I attempt to model space-time-attribute interactions at a human scale and for a set of applied uses. My focus is contemporary and in 2006 began a PhD topic on Agent Based Models (ABM) of daily activity. In this I plan to develop a model of the UK operating at the individual person level and run some simulations at as detailed a spatial and temporal resolution as I can manage using available computational resources.

I am generally interested in the evolution of socio-economics, in particular, resource discovery and exploitation from the agrarian revolution through the development of nation states and the industrial revolution and into the on-going information revolution.

On ABM

Agent Based Modelling is object orientated modelling with objects that interact and that may change behaviour or state as a consequence of this interaction. In ABM, a sometimes simple and sometimes complex *environment* object is often not regarded as an agent, but distinguished as a special object. The environment is the collection of all agents and a spatio-temporal framework in which agents operate. The environment is often not regarded as an agent although it has characteristics that change in response to agents actions. These changes are often fed back into changes in agent behaviour. In considering the environment as a framework or arena of action there are spatial and temporal origins, extents, scales and resolutions. What are the effects of arbitrary choices of these?

On Games, Education and Decision Support

There are some fantastic agent based models used in the entertainments industry, particularly in computer games. Virtual worlds are in genesis using software and models produced by game developers and models and simulations modified and played out by user communities. The games can end up incorporating detailed knowledge about sequences and timings of historical events; socio-economic, political and technological. How can we harness this and collaborate to generate planning and educational tools for operational social government?

Social shaping and the interaction between virtual environments and the movement of people in society although an interesting feedback, is perhaps a topic for another workshop another time.

Topics of relevance

- Data

- Archives
- Provenance
- Technology
 - High Performance Computing
 - Distributed Computing
 - Open Source Software
- Uncertainty
- Correlation of observed and estimated characteristics
- The potential of subjective models that cannot be validated
- Visualisation
- Linking models
- Scale and Resolution

On the workshop

I am looking forward to this event. I enjoy establishing and developing collaborations. I'm looking forward to reading about you and more about the subject in preparation.

As this is in part an NCeSS workshop, there are collaboration tools we can use. In particular, a wiki (<http://www.ncess.ac.uk/support/wiki/>). Anyone can get an account on this and I aim to use it to develop content as part of our collaboration. I have started a page for this workshop, it is nothing more than a stub at the time of writing. It is linked from the main page in the Agenda Setting Workshop list as Agent Based Modeling of Complex Spatial Systems (<http://www.ncess.ac.uk/support/wiki/index.php/ABMofComplexSpatialSystems>).