Call for Papers

Ecological Complexity is pleased to announce a special issue on:

Environmental micro-simulation:
From data approximation to theory assessment

Spatial micro-simulation has recently become a mainstream element in environmental studies. Essentially, different models, representing the same phenomena, are being extensively published and the "next step" sought is hypothesis testing, regarding the factors that determine system dynamics.

However, the problem arises that assessment of environmental theories using spatial micro-simulation lacks a leading paradigm. While the Occam's razor of positivism, which works perfectly in physics and chemistry, demands datasets covering the entire space of model parameters, the experimental abilities of environmentalists are limited and the data collected in the field represent only a small part of the always multi-dimensional parameter space. Consequently, any given model can be considered as merely *approximating* the few data sets available for verification and its theoretical validity is thus brought into question.

To overcome this limitation, we propose to generate a virtual world that will allow hypothesis testing based on environmental *theory*. That is, we propose to implement micro-simulation models using high-resolution GIS database and use them as a surrogate for reality, instead of the limited empirical database. GIS enables a realistically looking virtual world to be generated that, unlike the real one, provides the parameters characteristic of every trajectory. The almost unlimited data that can be generated from such a virtual world can then be used to assess our ability to extract rules and dependencies, estimate parameters and, finally, make applicable forecasts.

This *special issue* will focus on investigating models as representations of environmental theory with the help of a combination of real data and artificial worlds. We invite innovative research papers that employ different high-resolution models for generating virtual worlds, comparing them to each other, with the aim being to develop a better understanding of environmental theory. Examples can be studies of a model's robustness, a comparative study of dynamic models, investigation of the limitations of data fitting methods and of a model's sensitivity to changes in spatial and temporal resolution.

Scope

All sorts of micro-simulation, including cellular automata, agent-based systems, fuzzy systems, ANN and genetic algorithms, are welcome. The environmental systems of interest include, but are not limited, to:

- Complex ecosystems
- Landscape ecology
- Terrain analysis and landscape evolution
- Agriculture and pastoralism
- Human-environment interaction
- Land-use and land-cover changes
- Urban dynamics

Submission instructions

Abstracts of 2 pages in length should be submitted to the Guest Editors by **July 1, 2007**. The review process of those abstracts considered to be the most relevant will continue and authors will be required to upload the full manuscript to the *Ecological Complexity* website by **November 1, 2007**.

Guest Editors

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