SOUTH-EAST EUROPEAN RESEARCH CENTRE

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Student Research Seminars

THURSDAY 7th June 2007
16:00 – 17:00

SEERC Seminar Room
SEERC Bldg

"Modelling of Complex Systems: Towards Empirical Analysis of Emergent Behaviour"

by
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PhD Candidate

ABSTRACT

The concept of emergence as major characteristic of complex systems has gained on importance in the last decade as the information and communication systems are becoming more dynamic, distributed and complex. However the problems and the possible applications of emergence are not limited to computer science alone. The phenomenon is common to every aspect of the nature and the human world. Consequently in many scientific disciplines significant research efforts have been directed towards understanding, predicting and controlling emergent phenomena. Nevertheless given the variety and the complexity as well as the stochastic interactions upon which it is based, the phenomenon of emergence is still a scientific unknown. At this moment there is no framework or methodology which allows analysis of emergent properties even for relatively simple types of emergent properties. Moreover there isn't a method for verifying that (undesired) emergent behavior wouldn't appear in a system or model.

Aimed towards increasing our understanding of emergence, this presentation summarizes the work described is my transfer report aimed at development of a framework for empirical exploration of emergent phenomena in natural systems and social systems. The framework relies on agent oriented simulation for exploring the casual relationships in systems exhibiting emergence. Since the main target for study are already existing systems (rather then design of new systems), the framework can be viewed as reverse engineering approach which aims to define the causal relationships behind the emergents in a specific case study.

The seminar series is open to all members of *staff* and *students* of CITY and to *public* that wish to attend.

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