Modeling Urban Growth Patterns in Central and Eastern Europe with Agent Based Systems and Cellular Automata

Rendicontazione

Informazioni relative al progetto

MUGPCEE

ID dell'accordo di sovvenzione: 220151

Progetto chiuso

Data di avvio
1 Novembre 2008

Data di completamento
31 Ottobre 2010

Finanziato da
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Costo totale
€ 245 536,33

Contributo UE
€ 245 536,33

Coordinato da
UNIVERSITY COLLEGE LONDON

Questo progetto è apparso in...

Final Report Summary - MUGPCEE (Modeling Urban Growth Patterns in Central and Eastern Europe with Agent Based Systems and Cellular Automata)

Project objectives

The following objectives define the projects scope as described in Part B of proposal 220151:

- Developing an agent-based cellular automata model of urban growth applicable to the urban development context of post-socialist cities in Central and Eastern Europe.
- Applying the model for evaluation of different urban growth scenarios based on existing and alternative public policies.
- Identify key policies for the effective control of urban sprawl and the application of sustainable development principles in Central and Eastern European metropolitan areas.

Work performed

Since the beginning of the project on 1 November 2008, Dr Stanilov accomplished the following tasks in accordance with the approved work plan:

- Review of agent-based and cellular automata urban modelling literature on theory and practice. The researcher identified, reviewed, and annotated over 200 relevant books and articles.
- Lab skills development. The researcher evaluated the utility of existing modelling applications, finalized the selection of the most suitable modelling system (Metronamica) and acquired the necessary technical skills for its use in model development and validation.
- Database development. After selecting West London as a pilot study for the development of CA-based urban growth model, Dr. Stanilov generated a unique longitudinal high-resolution land use and land cover database documenting the historical patterns of growth and change in West London from 1875 to 2005 in 20-year increments. He also developed a similar high-resolution spatial database documenting the post-socialist urban growth of Prague's metropolitan area between 1989 and 2008.
- Model development. Dr Stanilov carried out the construction and calibration of a comprehensive cellular

automata model of urban growth using West London's database. Using the knowledge and insights gained from the West London model, Dr Stanilov developed a second model simulating the growth of metropolitan Prague since 1989.
- Model output analysis. The focus of West London's model was on analysis of the impact of accessibility and land use interactions as key determinants of metropolitan growth. The output from the Prague model was used to analyse critical aspects of post-socialist urban development related to the introduction and application of market-based principles of urban planning with an emphasis on the processes of suburbanisation. Several scenarios for the development of Prague's metropolitan area were used to evaluate the impact of alternative planning policies based on current trend, containment, polycentric and corridor growth.
- Dissemination of results. Dr Stanilov completed work on three peer-reviewed journal articles, two book chapters, three conference proceedings, one working paper, and two short articles. In addition, he presented the results of the project at nine international conferences and ten academic seminars in London, Paris, Tokyo, Kyoto, Hong Kong, Hamburg, Helsinki, Guimaraes, Prague, Dublin, Cambridge, and Birmingham.

Main results achieved

The researcher has successfully completed the project, achieving and in fact exceeding all of the goals outlined in the project proposal.

- Dr Stanilov has gained a commanding grasp of the issues surrounding the simulation of urban growth in cellular automata and agent-based modelling. He has become an expert in the application of Metronamica - one of the most advanced CA modelling systems available today.
- Dr Stanilov produced two comprehensive data sets capturing the dynamics of metropolitan growth patterns in London and Prague. Both datasets are unique in terms of their level of spatial resolution and land use detail. The London database stands out in particular as one of the richest historical accounts developed to date of longitudinal high-resolution land use changes in a contemporary metropolitan area.

Ultimo aggiornamento: 29 Marzo 2011

Permalink: https://cordis.europa.eu/project/id/220151/reporting/it