RITSUMEIKAN UNIVERSITY

SCHOOL OF GEOGRAPHY

Urban Simulation: Methods, Models and Planning Applications

Twelve Lectures and Workshops

October 12th – October 15th, 2010

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List of Lecture Topics

These topics may change but there will be a lecture handed out before each is presented. Look at the web site for any updates

Lecture 1: What are Models: The Scientific Context: Definitions of Model and Theory: The Model- Building Process, Data Analysis to Calibration to Prediction

Lecture 2: Modelling Types and Styles: Urban Models defined: Classifications of Models, Model Terminology: Examples of Three Model Types

Lecture 3: Basic Theories of Space, Social Physics and the Urban Economy: The Role of Distance in London: Examples: Von Thunen, Population Density, Gravitation

Lecture 4: Land Use Transportation Models 1: Spatial Interaction

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Lecture 5: Land Use Transportation Models 2: Discrete Choice Theory, Entropy-Maximising and Utility Maximising

Lecture 6: Integrated Comprehensive Models: Lowry Models: LUTI models

Lecture 7: Contemporary Urban Land Use Models ILUTE and UrbanSim: Disaggregation of Model Structures

Lecture 8: Integrated Assessment: The Tyndall Models for Greater London: Topical Issues of Climate Change and Energy Predictions in Models

Lecture 9: Cellular Automata Modelling: Principles of Cell Space Simulation:

Lecture 10: Modelling Urban Morphology: Fractal Geometry

Lecture 11: Agent-Based Urban Models: Individual Based Models: Ideas about Dynamics and Movement: Pedestrian Models

Lecture 12: Using Models in Planning: Planning Support Systems

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Assignments and Workshops

We will introduce three assignments that we will work through in the workshop sessions. Two will be based on exploring population density and spatial interaction is using spreadsheets while the third will be about residential location using a simple model

We are asking each of you to form groups of 2 persons and to choose a topic from the following list of assignments, most of which will be introduced as the course of lectures progresses.

These assignments will involve you in developing for a case study different from that you are given in the workshop using data from some Japanese city such as Tokyo, Kyoto, Osaka and so on which will be provided by Professor Yano who will also describe in more detail the assignments and presentations that you will have to make on the last day according to the schedule he will hand out.

List of Topics

1. Population Density. Working out, plotting, examining and commenting on population density variation with respect to distance in a large city using a small number of zones (~10 or so).

2. Residential or retail location modelling using a simple program provided for you, again with a small number of zones defining a large city

3. Examining population size distributions in a large city using a larger number of zones, or taking cities in Japan from the Population census and examining their size and frequency

4. Exploring agent-based models using one model from the Netlogo suite of models and commenting on its structure with respect to how the model works.

The Course Web Page

Copies of the Powerpoints as PDFs

Lecture Readings

Assignments and Workshops

Software

http://www.casa.ucl.ac.uk/rits/

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