Assessment for CASA0002 – Urban Simulation (to be confirmed)

Deadline: 24th April 11am.

Word Limit – 3,000 words

The following assessment is designed to assess your understanding of the different urban modelling methodologies introduced in the course. The questions are based on the practicals/coursework developed during the course and posted in Moodle.

Please answer ALL questions in the form of a report, allocating ~1000 words per question. Each question will be assessed over 100 points, and your total mark will be the average of the 3 marks for each question, all contributing equally. Carefully explain and illustrate your analysis with appropriate diagrams. The assessment should not exceed 3000 words in total. (References, numerical tables and data plots do not count towards the total number of words.)

Q1. Networks: This question looks at the resilience of London's underground as a network. In order to explore this, consider different strategies to remove nodes and evaluate the impact of the removal on the network. The attack strategy can be outlined in terms of a single or multiple removals, and these can take place at the same time or sequentially. You need to clearly structure this question in the following way: 1) brief introduction (this could consist of only a couple of sentences); 2) state the criteria chosen for the node removal: this should be done in terms of a measure, which needs to be clearly explained and contextualised for London's underground; 3) specify how you are evaluating the impact of the node removal, which once again needs to be given in the form of a measure that is clearly explained and contextualised; 4) analysis; 5) conclusions. (Draw upon the "essential coursework" material given to you in Lecture 2 of networks for this assignment.)

Q2. Spatial Interaction Models: This question tests your knowledge on the different models introduced in the lectures and the role of the parameters, in addition to your working ability to use the models. In section 1) explain the different models briefly, unconstrained, production/attraction and doubly constrained models, mainly stating in which situations you would use them. In section 2) explain the role of the parameters briefly. In section 3) select a scenario and using the practical given to you in class, explore the consequences of varying some of the model parameters and inputs, on both interaction flows and the origin or destination estimates produced by the model.

Q3. Agent Based Models: Provide a short introduction defining both ABM and CA, and comparing/contrasting the two. Take the model and vary the parameters of the model to construct 3 different scenarios. Describe them and evaluate the minimum time needed to run the simulation in order to reach a steady state, and the minimum number of runs needed in order to acquire statistically meaningful results.