CEGE0097: Spatial Analysis and Geocomputation

Spatial Analysis Project

Week set: 6 (02/10/2024)

In this coursework, you will work in *groups of 3* to solve a spatial analysis task of your choosing from one of two broad themes, which are: 1) site selection through multi-criteria decision analysis; 2) spatial statistical analysis. You will use the skills and theoretical background you have gained in the practical sessions and lectures to take control of the process from start to finish. As a group, you will be responsible for:

- **Defining a problem and presenting it to your peers**
- **Sourcing a dataset or datasets of interest**
- **Reviewing the relevant literature and context (e.g. background to the problem, existing approaches, appropriate methods, relevant policy).**
- **Research design and methodology**
- **Carrying out the analysis**
- **Presenting the results in a report**

You will receive a single grade for the project, which is broken into three parts:

1. A presentation to your fellow students
2. Joint parts of the report
3. An individual part of the report

Part 1: Group presentation (to be presented 13th and 14th November 2024)

The presentations will take place on 13th November in Birkbeck Malet Street B30 at 11am. There will be a reserve session on 14th November if we need more time.

Each team will prepare a 10 minute presentation outlining their project. The purpose of this is to enable you to share your ideas and gain critical feedback at an early stage. The presenting duties should be shared between the team members. Your presentation should include:

- **Title**
- **Objectives and/or hypotheses**
- **Data requirements and sources**
- **Outline of methodological approach**
- **Initial results if available– e.g. Exploratory Spatial Data Analyses**
- **Roles within the group**
- **Project plan**

The presentations will be peer-assessed, i.e. you will all mark each other's presentations on a range of criteria to produce a score from 1-10. The marking will be anonymous and carried

out electronically. It is *very important* that you adhere to the 10 minute time limit. It is *not fair* on your fellow students to take more than your allotted time. If you overrun then your fellow students may choose to consider this in their evaluation.

The group presentation is worth 10 marks. Your team's grade will be determined by the average score you receive from your fellow students. For example, if your team's average score is 7/10, you will get 70% of 10 marks.

Part 2: Project report (due 5pm 17/01/2025)

Each team will produce a report of 4500 words *max*. There are 90 marks in total available for the report. You should include:

- **Introduction and data description (joint, 15): Problem definition, background and brief literature review. Justify your choice of data and provide sources**
- **Exploratory spatial data analysis (joint, 15): Summarise the properties of your data**
- **Methodology (individual, 15): Describe the method you are using to analyse the data**
- **Results (individual, 15): Present the results of your individual section**
- **Discussion and conclusions (joint, 15): Combine and discuss results here (e.g. for final site selection, or to discuss the relative merits of approaches). Include limitations and future work**
- **Graphical presentation and structure (Joint, 10, individual, 5): Quality of presentation (maps, tables, figures), report structure, use of markdown.**

Divide the words roughly according to the weighting of each section. As a guide, the individual section should be roughly 1000 words each and the joint sections roughly 1500 words total. It is important to write *concisely*, and only include maps and figures that are directly relevant to your arguments: Submissions will be made on Moodle via Turnitin. Each of you should submit **your own identical copy** on Turnitin so that grades can be returned individually.

Note: The structure of the report may vary depending on the project you choose. This can be discussed with your course tutor over the coming weeks.

Example Projects

Site Selection

Choose a site for a new hospital

Select an area of interest in the UK or elsewhere to locate a new hospital. Questions you may wish to consider:

1. Where are the current hospitals?
2. Where is the population at risk?
3. What is a suitable site for a hospital?

For the individual parts you may wish to:

1. Each focus on a different aspect of the problem, e.g. physical vs demographic
2. Each choose a different site to work on
3. Each choose a different aspect of the problem, e.g. locating a hospital and ambulance stations.

Spatial Statistical Analysis

What are the factors affecting house prices?

Using a house prices dataset, examine the factors affecting house prices in that location. You may wish to consider:

1. A range of explanatory variables, e.g. demographic data
2. Appropriate methods for accounting for spatial autocorrelation and heterogeneity
3. Appropriate levels of aggregation for the data you use.
4. An analysis of the residuals

For the individual parts you may wish to:

1. Each focus on a different city, or on urban vs rural to see how the results differ.
2. Each try a different type of regression model, e.g. global (spatial lag, spatial error) or local (geographically weighted regression).
3. Each use a different aggregation of the data, e.g. points, vs. ward vs. borough.

Note: You should not use the same dataset used in the course materials

You are encouraged to propose your own project!

Examples of projects from previous cohorts:

1. Investigating the urban heat island effect
2. Comparing crime patterns in different cities in the US/UK
3. Selecting sites for student accommodation
4. Selecting rooftop sites for urban bee hives
5. Modelling spatial variations in high school exam performance

Please discuss your initial ideas in your group and with your course tutor before the session on 31st October.