Análisis Espacial y de Redes

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Because the detailed analysis of spatial data is a relatively young and informal field, there is no "corpus" of training that is considered standard (and there are very few textbooks). Recognizing this fact, the modest aim of this class is to help students "think spatially" so they can understand and engage with spatial data and studies of spatial data intuitively and creatively. The course is designed to train students to think clearly and rigorously about spatial data and its analysis, to be informed consumers of spatial analyses, and to be capable of conducting their own analysis and display of spatial data for policy or research. Usefulness and creativity in analyses are emphasized alongside accuracy, clarity, and aesthetic appeal in the display of results. Exposure to diverse applications, through both readings and labs, give students a sense of breadth and utility of analyses they may undertake using tools from the class.

The first half of the course teaches students the foundations of spatial data and its analysis. Each class introduces new data structures and various analytical or statistical measures applied to these structures. Associated readings, discussions and lab assignments reinforce students understanding and help them see how these ideas are applied. Students use Matlab for all assignments so they may understand how foundational concepts build on one another and develop an understanding of the underlying mathematical procedures.

Advanced topics: The second half of the course exposes students to advanced topics, such as highdimensional data, optimization, remote sensing, and more advanced analytical techniques. Students will also be introduced to QGIS.

Final project: During the second half of the course, students will develop a final project on a topic of their choosing. The project will give the students an opportunity to apply the tools they have learned throughout the course to a problem they are interested in. Through feedback on their proposal and presentation, students are encouraged to undertake analyses that are thoughtful, clear and that they find challenging.

Bibliografía

1. Christopher Lloyd (2010): "Spatial data analysis." *Oxford University Press*.

2. Matthew O. Jackson (2010): "Social and economic networks." *Princeton University Press*.

Evaluación

1. Reuniones semanales (10%)

2. Participación en seminario de microeconomía del Instituto de Economía (10%)

3. Tareas empíricas (50%)

4. Trabajo de curso (30%)

Programa del curso

1. Sistemas de coordenadas y notación

2. Medida y representación del espacio

3. Procesos punto

4. Líneas, polígonos, y redes

5. Campos unidimensionales y multidimensionales

6. Datos en 3 dimensiones

7. Optimización en problemas espaciales

8. Teledetección

9. Regresiones espaciales