

IUDI Final Project

This course asks students to conduct one Urban Informatics project for the semester, grounded in available urban data and applying some of the fundamental and/or advanced Urban Informatics techniques covered in this class. Working as a group is strongly encouraged to consist of a maximum of 4 people.

The important dates of the project are as follows:

- Project proposal submission: 11/16/2021, 11am
- Final project pitch presentation: 11/16/2021, 11am-1pm (online)
- Final presentation: 12/14/2021, 11am-1pm
- Final packet submission: 12/21/2021 11:59pm

Project guideline

The project constitutes the data analytics and visualization framework, that addresses a specific city problem or urban questions of your choosing¹. The range of potential problems include issues discussed in class or in readings, challenges defined by NYC strategy documents (such as OneNYC, Vision Zero, etc.), or problems you come across as a planner. Projects focusing on the New York area are highly recommended, but other cities/countries are welcome.

Defining a suitable problem, given data and time constraints, is critical to the success of your project. Problems and analysis that focuses on or addresses issues of sustainability or social equity and equality or other planning related perspectives should be prioritized. The analysis using Python programming language and visualization techniques is a key part of your project, but it is more important to demonstrate a logical approach to try to solve the problem identified and communicate effectively how your analytics can be implemented and lead to operational or policy change. You should acquire data from Open Data platforms or other publicly available datasets - self data collection is more than welcome.

¹ Urban Innovation assignments will be great resources to develop your project topics as well as framework.

You are asked to exhibit an application of Urban Informatics based on your own interests. Your project should include the following components:

- Defining problem(s) and research question(s)
- Literature review of at least three (3) publications
- Data collection and processing
- Computational thinking framework development
- Exploratory data analysis and descriptive statistics: The initial step in your project is to conduct exploratory analysis and play around with data. Exploratory analysis could include both quantitative and qualitative methods, fully using your skills from this course as well as other courses.
- Main analysis: As this course is not a quantitative or modeling course, you are not required to conduct any advanced data analysis. However, you must implement at least one quantitative or geospatial method discussed in this course and/or Planning Methods and/or the GIS course. The followings are the example methods that you can use (but not limited):
 - Central tendency
 - Variability
 - Correlation
 - Simple linear regression
 - Spatial density
 - Network analysis

You may also use techniques we don't explicitly cover, but do not stray too far from the course topics.

- Data visualizations as a main product: One of the most important goals of the final project is to create a representative image of your project. You are asked to create eye-catching data visualization outputs through Python programming.
- Interactive visualization (optional, but strongly recommended): It is really important to engage with the public through interactive visualizations. If you work on Plotly visualizations or D3 based web visualizations, you will receive an extra credit. If you have any interactive visualization products, please show live demos during your final presentation.

Deliverables

You should work on four deliverables:

- **Project proposal (PDF format), Due by November 16**

The proposal is a 1-2 page text document outlining the project scope, research question(s), the data that are going to be used and Urban Informatics approaches you're going to apply. The (anticipated) individual contributions of each team member should be specified.

- **Report or poster² (PDF format), Due by December 21**

There are no specific formatting requirements and words limit, but please consider **your report or poster as a design product**. Your final product should include the following:

- Introduction
- Literature review
- Clear description of data collection, processing, and analysis
- Results and outcomes with visualizations
- Findings, impacts, and limitations
- References (bibliography of works cited in APA format)
- URLs of your web development (if any)

- **Presentation (PDF format), Due by December 14**

Specific guidelines for the final presentation is TBD.

- **Technical documentation (Data source and Jupyter notebook), Due by December 21**

As we have discussed, reproducibility is an important concept of data analytics. As a proper practice, you should try to organize your data analytic environment. Please assume that you will collaborate with someone and share structured technical documentation including data and Jupyter notebooks with appropriate markdown or notes. Please submit **a compressed file including a data source documentation, a script folder, and an output folder**. Jupyter notebooks should be run without error. If you work as a group, each team member should submit his/her own technical documentation based on contributions.

Grading

Based on the syllabus, full marks of the final will be 20 points. The project will be graded on the following criteria:

- Creativity of topic and question-driven aspects (2)
- Data collection, processing, and exploratory analysis (3)
- Computational thinking framework and application of relevant skills (3)
- Effectiveness and esthetics factor of visualizations (3)
- Communication through the presentation (3)
- Clarity of report or panel composition (3)
- Suitability and reproducibility of technical documentation (3)

² Preferred.