M3239.003100 Data Analysis and Visualization

Hyunwoo Park

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Instructor

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Teaching Assistant

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Class Info

- Schedule: Tuesdays and Thursdays, 2:00-3:15 PM
- Location: 942-302 (also delivered via Zoom)
- Office Hours: By appointment

Overview

Businesses and organizations today collect and store unprecedented quantities of data. In order to make informed decisions with such a massive amount of the accumulated data, organizations seek to adopt and utilize data mining and machine learning techniques. Applying advanced techniques must be preceded by a careful examination of the raw data. This step becomes increasingly important and also easily overlooked as the amount of data increases because human examination is prone to fail without adequate tools to describe a large dataset. Another growing challenge is to communicate a large dataset and complicated models with human decision makers. Exploratory data analysis, and visualizations in particular, helps find patterns in the data and communicate the insights in an effective manner. This course aims to equip students with methods and techniques to summarize and communicate the underlying patterns of different types of data. In addition to creating high-quality static visualizations, this course teaches students how to build an interactive visual analysis system.

Objectives

By the end of this course, students should successfully be able to:

- Explain pros and cons of various visual representations depending on the context and form of data
- Choose appropriate visual representations for special forms of data such as geospatial and network data

- Compose a visual dashboard composed of interactive visual artifacts
- Create high-quality static visualizations.
- Plan and implement a customized interactive visual analysis system

Prerequisite

- Prior experience with Python
- While no experience in web programming (HTML, JavaScript CSS) is assumed, students should be a self-learner to pick up the pace unless they have experience in web programming.
- Or permission of the instructor

Grading

- Midterm: 40%, Final Group Project: 50%, Participation (Online Q&A): 10%

Course Schedule

Please note this schedule is subject to change

Category	Date	Lecture	Note
• Stata • Regression	Week 1 – Week 4		Midterm
• Visualization with Python • Streamlit • Google Studio	Week 5 – Week 9		
• Web Programming	Week 10 – Week 15		Project Presentation