Sungkyunkwan University (SKKU) International Summer Semester (ISS) 2024

Data Visualization

Prof. Kyongil Yoon, Notre Dame of Maryland University

SHORT COURSE DESCRIPTION

This course explores the field of data visualization. Topics cover the expanse of visualization from data preparation and cleaning to visualization types such as time-series, box plots, and violin plots. Included in our study are visualization tools, online interactive visualizations, and other issues related to the display of big data.

READING MATERIALS

Reading materials will be provided in advance during the course. All the lecture notes and other course materials will be provided in the class. Background readings include:

1. The Truthful Art: Data, Charts, and Maps for Communications, Alberto Cairo, 1st Edition, New Riders, ISBN-10: 0321934075
2. Interactive Data Visualization for the Web: An Introduction to Designing with D3, Scott Murray, 2nd Edition, O'Reilly Media, ISBN-10: 1491921289

COURSE REQUIREMENTS AND GRADING

This course consists of readings, tutorials, and hands-on visualization activities. Students will be exposed to readings, videos, and tutorials on key principles and concepts within the field of data visualization. Students are then asked to apply these concepts in a variety of hands-on activities.

To obtain a deep understanding of data visualization it is imperative that students create and explore their own visualizations. To this end, we will use several programming languages and visualization tools in this course. No prior understanding of programming is required. Visualizations for this course require a minimal amount of programming, which will be covered in tutorials, examples, and readings. Moreover, all visualization tools used in this course are freely available on the Web.

Grading will be done as follows:

Discussion Forum:	28%
Assignment:	42%
Team Project:	20%
Attendance & Participation:	10%

[All ISS classes are pass/fail based on the student academic achievement evaluated by grades on a scale of 100 points (grade of 60 or above is Pass). SKKU regulations require students to attend at least 80% of all classes.]

COURSE SCHEDULE

– WEEK I –

Monday (1 July)
> Why Data Visualization?
> The Five Qualities of Great Visualization
> Discussion Forum 1

Tuesday (2 July)
    The Truth Continuum
    Assignment 1: Visualization Critique
Wednesday (3 July)
    Truthfulness: Of Conjectures and Uncertainty
    Discussion Forum 2 – Box Whisker Plot
Thursday (4 July)
    Principles of Data Visualization
    Assignment 2: School System Box Plot Activity

– WEEK II –

Monday (8 July)
    Know Your Data: Exploring Data with Simple Charts
Tuesday (9 July)
    Visualizing Distributions
    Assignment 3: Visualization Tools Paper
Wednesday (10 July)
    Tools for Data Visualization: Python, R
    Discussion Forum 3: Discussion on TED Talks
Thursday (11 July)
    Revealing Changes
    Tools for Data Visualization: Tableau
    Assignment 4: R Activity – Violin Plot

– WEEK III –

Monday (15 July)
    Online and Interactive Visualizations
    Web Basics: HTML, CSS, JavaScript
Tuesday (16 July)
    D3: Interactive Data Visualization for the Web
    Assignment 5: D3 Visualization Activity
Wednesday (17 July)
    More D3 Hands On
    Discussion Forum 4: D3
Thursday (18 July)
    Additional Data Considerations: Uncertainty and Significance

– WEEK IV–

Monday (22 July)
    Additional Data Considerations: Seeing Relationships
    Assignment 6: Confidence Intervals Activity
Tuesday (23 July)
    Advanced Data Considerations: Mapping Data
Wednesday (24 July)
    Final Presentation of Team Project