CSE 557A: Information Visualization (Fall 2018)

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TAs  Claire Yuan (yuanyue@wustl),
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Meeting Time  Tuesday and Thursday 4:00-5:30 pm
Location  Seigle Hall, Room 301
Grades  Canvas
Questions  Piazza

Course Description.

In this course, we study the principles for transforming abstract data into useful information visualizations. We learn about the state-of-the-art in visualization research and development, and we gain hands-on experience with designing and developing information visualizations. We also learn how to critique existing visual designs and how to evaluate the systems we build. Weekly readings include current research papers from the Information Visualization community.

Prerequisites: CSE247 & CSE330

Office Hours.

Prof. Ottley: By appointment
Josh: Thursdays 6:30pm - 8:30pm outside Jolley 326
Claire: Fridays 11am-1pm in Jolley 431
Lou: Tuesdays 1:30pm - 3:30pm in Jolley 517

Aims.

Aims of the course are:

- Design and develop visualization solutions for exploring real-world data
- Develop an appreciation for visualization research and practice
- Improve presentation skills
- Improve individual and collaborative problem-solving skills
Objectives.

Upon completing this course, you will be able to:

- Understand the basics of visualization design and research
- Gather and "wrangle" data from the wild
- Read and synthesize research papers
- Create professional and animated visualizations using Processing and Processing.js
- Design and create professional and aesthetic web-based, interactive data visualizations using HTML5, CSS, JavaScript, SVG, and D3.js
- Produce high-quality visualization tools that aid data exploration and decision-making
- Prepare high-quality documentation and artifacts related to the design process
- Understand concepts of usability and evaluation

Technology.

This class will require the use of Processing, D3.js, JavaScript, HTML, CSS, GitHub, and Python (or any other scripting language). These programs will be used to manipulate data and build visualization tools. You may also use other tools such as database management tools, other visualization platforms, etc.

Course Work.

We will meet twice per week. During each class, the first portion will be a presentation and discussion. The second portion the will vary between studio work time and class activities. You should expect at least 5-10 hours per week to work on the various assignments, readings, and the particulars of each phase of the final project.

Assignments.

There will be three programming assignments at the start of the semester.

Studios.

There will be several short in-class studios throughout the semester.
Final Project.

The final project will be a significant focus of the course. The goal of the project is to design and implement a web-based interactive visualization. You will provide the dataset(s) and the questions you need to answer. You will work closely with other classmates in a 2-3 person project team.

Reading Reports.

We will post the required readings in the schedule. Occasionally, we will also post additional resources you may find interesting (marked Recommended Reading).

To enable us to have meaningful discussions during class, you should read each of the required readings before the class meeting. For each reading, you are expected to post 250 to 500 words related to the readings, in the appropriate part of this forum.

You can start a new discussion, participate in an existing discussion, or do a bit of both. You can discuss all of the assigned readings, or focus on a portion of the reading that you found most interesting. You can put all of your 250 to 500 words in one post, or spread them out across several. The important part is that we can see an intellectual effort in your forum participation, not just simple summaries of papers.

Your participation in each week's forum discussion will be graded on a scale from 0 to 3.

- 0: If you do not participate.
- 1: If your participation seems weak and does not convince us you read, understood, and thought about the readings.
- 2: If your participation shows that you read and understood the papers and had something interesting to say. This will be the most common grade.
- 3: Reserved for especially insightful participation.

In discussing readings, it is generally easy to find something to criticize in any piece of research. But focusing exclusively on the potential flaws of research is usually not productive. You would find it more intellectually worthwhile to focus on the positive aspects of a piece of work, what new ideas are prompted, or what you might have done differently if you conducted the research. This will also lead to much more valuable discussions.

Potential topics for discussion are:

- What idea or innovation enabled this research?
- What more might be done based on that idea or innovation?
- What new questions or research agendas are suggested by this research?
• What would you have done differently with approximately the same resources available to the original authors?
• What would you have done differently with half or ten times the resources available to the original authors?
• How might this research have informed some other research you have seen?

Participation will only "count" if posted by 3:00 AM before each class meeting. This ensures that the day's discussion coordinator has ample time to review discussion the next morning. Feel free to continue a discussion thread after this time (and even after class). But know that you need to post before then to get discussion credit.

Also feel free to suggest readings that you believe are relevant to course.

Grading.

Final grades will be based on the following criteria:

35% Assignments

• 5% Assignment 0
• 10% Assignment 1
• 10% Assignment 2
• 10% Assignment 3

40% Final Project
15% Studios
10% Reading Reports

Late Policy.

We will allow you to turn in your assignment up to 24 hours late with no penalty. After that, we will no longer accept submission under any circumstances.

Academic Integrity Policy

You are welcome to discuss the course’s ideas, material, and homework with others to understand it better, but the work you turn in must be your own (or for the project, yours and your teammate’s). For example, you must write your own code, design your own
visualizations, and critically evaluate the results in your own words. You may not submit the same or similar work to this course that you have submitted or will submit to another. Nor may you provide or make available solutions to homework to individuals who take or may take this course in the future.

In homework, you must not use libraries or code provided on the Internet except when explicitly permitted in the instructions.

In your project, you may use limited parts of code found online, provided its license allows you to re-use it. You are free to use general purpose frameworks or libraries (e.g., Node.js, Bootstrap, JQuery, etc.) You may not use plotting libraries such as plot.ly. You must acknowledge any source code that was not written by you by a proper citation (author, year, title, time accessed, URL) directly in your source code (comment or header) and provide a link to the source. You can also acknowledge sources in a README.txt file if you used whole classes or libraries. You also must include these references visible on your project website.

We will use both manual and automatic methods to check your submissions for plagiarism and will also check against online sources and submissions from previous years.

Effective learning, teaching, and research all depend upon the ability of members of the academic community to trust one another and to trust the integrity of work that is submitted for academic credit or conducted in the broader arena of scholarly research. Such an atmosphere of mutual trust fosters the free exchange of ideas and enables all members of the community to achieve their highest potential. In all academic work, the ideas and contributions of others must be appropriately acknowledged, and work that is presented as original must be, in fact, original. Faculty, students, and administrative staff all share the responsibility of ensuring the honesty and fairness of the intellectual environment at Washington University. Please make sure you are familiar with the Washington University Academic Integrity Policy, as it will be strictly applied.

**Rights and Responsibility.**

**Sexual Assault.**

The University is committed to offering reasonable academic accommodations to students who are victims of sexual assault. Students are eligible for accommodation regardless of whether they seek criminal or disciplinary action. Depending on the specific nature of the allegation, such measures may include but are not limited to: implementation of a no-contact order, course/classroom assignment changes, and other academic support services and accommodations. If you need to request such accommodations, please direct your request to
Kim Webb (kim_webb@wustl.edu), Director of the Relationship and Sexual Violence Prevention Center. Ms. Webb is a confidential resource; however, requests for accommodations will be shared with the appropriate University administration and faculty. The University will maintain as confidential any accommodations or protective measures provided to an individual student so long as it does not impair the ability to provide such measures.

If a student comes to me to discuss or disclose an instance of sexual assault, sex discrimination, sexual harassment, dating violence, domestic violence or stalking, or if I otherwise observe or become aware of such an allegation, I will keep the information as private as I can, but as a faculty member of Washington University, I am required to immediately report it to my Department Chair or Dean or directly to Ms. Jessica Kennedy, the University’s Title IX Director. If you would like to speak with directly Ms. Kennedy directly, she can be reached at (314) 935-3118, jw kennedy@wustl.edu, or by visiting the Title IX Office in Umrah Hall. Additionally, you can report incidents or complaints to the Office of Student Conduct and Community Standards or by contacting WUPD at (314) 935-5555 or your local law enforcement agency. See: Title IX

You can also speak confidentially and learn more about available resources at the Relationship and Sexual Violence Prevention Center by calling (314) 935-8761 or visiting the 4th floor of Seigle Hall. See: RSVP Center

Bias Reporting.

The University has a process through which students, faculty, staff and community members who have experienced or witnessed incidents of bias, prejudice or discrimination against a student can report their experiences to the University’s Bias Report and Support System (BRSS) team. See: brss.wustl.edu

Mental Health.

Mental Health Services’ professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. See: shs.wustl.edu/MentalHealth