

INFO4310: Interactive Information Visualization

Instructor: Prof. Jeff Rzeszotarski, jeffrz [at] cornell.edu

Time & Location: M/W/F 11:30am-12:20pm in the aether
Please refer to the Zoom document for more details

Course Prerequisites: INFO 3300 (or prof. permission)

Course Website: <https://jeffrz.com/info4310/>

Readings, Zoom links: <https://canvas.cornell.edu/courses/19679/>

Discussion, Q&A: <https://piazza.com/class/kek3a8esy652mz>

Assignment Submission: <https://cmsx.cs.cornell.edu>

Course Office Hours: See pinned post on Piazza

Contacts: Prof. Rzeszotarski for course administration
Post to Piazza any content questions

Course Description

In this course you will develop a personal toolkit for representing data and developing interactive data visualizations. We focus on three core elements of successful visualizations: choosing the best representation for both data and intended outcome; incorporating interactivity (or leaving it out) strategically; and following design principles that account for limits in human cognition, perception, decision-making, and physiology. Through practical exercises we will understand the unique technical challenges that visualization imposes on designers and develop a sensibility for the visualization process from data scraping to end evaluation. Whereas in INFO3300 the focus is often placed on *how* to construct a visualization, in this class we will focus our efforts on *what is the best way* to construct a visualization *within specific constraints*.

Learning objectives:

- Develop competency in advanced interactive visualization techniques (e.g. client-server interaction, linking views, designing new interactions)
- Practice visualization design critiques and train a critical eye for visualizations
- Learn and apply human perceptual, physiological, and cognitive limits in design
- Work constructively on your own or in a team to make complex visualizations and interactive environments that reveal insights or tell a story

Structure

This class contains **lectures** on visualization design concepts (33%), class **discussions** of academic visualization research papers and book chapters (33%), and design **activities** such as brainstorming and critique (33%). On a weekly basis, students will engage in each of these three activities, participating as a class and in small groups. You will complete **3 large homework assignments** over the course of the term which will involve both development and design content. Each homework will take approximately 2.5 weeks to complete and may be done individually or in small groups as directed. All students will complete **one final project** during the second half of the term. Projects will have 2 milestones, culminating with class critique of projects before the end of the term. For those who have taken INFO3300, the assignments and final project as expanded versions of the projects from that course.

The class will make heavy use of the [course repository on Github](#). It will contain the course schedule as well as resources for discussion and activities. We will regularly use [Piazza](#), **discussing readings online** on a weekly basis before class. Each student will claim several readings during the semester and act as the **discussion leader** for that day's class. Leading a discussion will involve delivering a **short summary presentation** on the paper contents and writing a **summary post** on Piazza with discussion starter questions. In order to jump-start discussion, students who are not leading a discussion will reply to each of the reading threads prior to the in-class discussion. Students will also be appointed several times as **group discussion leaders** in varying numbers based on class composition (e.g. if whole-class, then the leader does it; if 6 smaller groups, then 6 leaders). Leaders will help to keep the conversation going in the group and will provide a short summary of the discussion online. Each week we will also complete **in-class activities**. If a homework or project milestone has recently been submitted, the following class will involve **critique** in small groups, as learning to productively criticize others' work is an effective way to improve your eye for design. During other weeks students will sketch, **brainstorm**, and iterate on designs for challenging problems in small groups.

Course Attendance & Absences

As this is an unusual semester for Cornell, **attendance will not count for a grade this term**. That being said, **attending class is important to your overall success in the class and is considered mandatory**. While course content will be posted to the course web site so that students can follow along during lectures and discussion, the content does not deliver the full richness of a class discussion or activity. As the goal in this

class is *synthesis*, productively integrating knowledge through practical experience and contemplation, missing class will not deliver this learning objective. Students are encouraged to attend as much class as possible. In an effort to save time, when possible content will be pre-recorded and delivered asynchronously as well.

Assignments & Late Work

Homework will be assigned on Mondays and are due at **12:00PM (noon) ET on Thursdays**. It is critical that homework is turned in at this point, because it will be integrated into course critique activities the following Friday. As such, **late work will receive a 0 (even if it is only 1 second late)**. Students will use CMS to submit homework assignments and projects with their associated design content. Students will also **make all projects and homework results web-accessible** via platforms such as Heroku or Github.io. This part is critical, as web access will be used for critique.

Getting Help

Please make use of the following channels of communication:

- The course web site and policy documentation for basic procedures and rules
- Office hours for individual help on assignments
- Posting on the [course discussion forum](#) - please search for similar questions before you post a new one
- For personal questions, email the instructor
- There are no TAs for this class, so please rely on each other for peer support in addition to professor office hours
- Do not email about late homework or absences

Grading

As in some cases students perform better on homework assignments or on projects, we will offer **two grading options for the course**. Grades will consist of several components. First, homework and final projects will count for a significant portion of the final grade. Second, presentations and posts as discussion leader will be graded. Finally, discussion group leadership will be graded on a completion basis. Your final grade will be computed automatically based on the **better of these two options**:

	Option A	Option B
Final Project	45%	37.5%
Homework Assignments	30%	37.5%
Discussion Leadership	15%	15%
Paper Presentation & Posts	10%	10%
Attendance	0%	0%

Letter grades will be assigned using the **integer part of your final %**. For example, 96.01 and 96.99 both resolve to 96%, which would be an A- on the grade scale.

Note that **we will be using a normal grade point scale for this course**.

97.0%-100%: A+	77.0%-79.9%: C+
93.0%-96.9%: A	73.0%-76.9%: C-
90.0%-92.9%: A-	70.0%-72.9%: C-
87.0%-89.9%: B+	66.0%-69.9%: D+
83.0%-86.9%: B	60.0%-65.9%: D
80.0%-82.9%: B-	<60%: F

Extra Credit

Unlike in INFO3300, there will be fewer opportunities for extra credit this term. If **75% of the class completes the mid-semester survey**, then the entire class will receive a 0.5% bonus to their grade. A 0.5% bonus will be offered to students who **post a neat visualization example** from the web to the "Visualization Examples" tag on Piazza before Thanksgiving Break. Alternatively, you can post an interesting dataset to the "Datasets" tag on Piazza (no Kaggle or other major data repositories). No duplicates allowed, so do this earlier rather than later. SONA participation will not earn extra credit in this course.

Notes on Zoom

There is a separate document, available off of the course website, outlining specific policies and guidance for using Zoom. This is going to be evolving as the class tries out new activities and judges their effectiveness. Please be sure to report back to the professor if you have any concerns or ideas for improvement.

Academic Integrity

All students are expected to abide by the University's [Code of Academic Integrity](#). This is absolutely critical in an online environment. Violations of the Code will be addressed with zero tolerance.

We will follow university policies as outlined in the Academic Integrity Handbook. You are encouraged to discuss homework, but each student will complete assignments alone. TAs are present to assist in your learning process but are not expected to offer specific code suggestions. Learning from other individuals' code is an important part of programming, but for group projects the code should be the work of the group members except for standard libraries such as D3, lodash, and jQuery. Any code used in projects that was not written by the group members should be placed in separate files and clearly labeled with their source URLs. If you have benefitted from online resources (such as examples or StackOverflow answers), list the URLs in comments in your own code, even if you did not directly copy anything. Recall that some workplaces ban StackOverflow outright to avoid diluting their IP. Project work that relates to your other classes or research is encouraged, but you may not recycle assignments. There must be no doubt that the work you turn in for this class was done for this class and this class alone. **This includes lecture notes and code!** Integrity issues will be adjudicated at the discretion of Professor Rzeszotarski and course staff and include penalties such as referral to the Academic Integrity Board.

Blatant instances of copying lecture notes into homework will be considered integrity violations. This is a zero-tolerance policy. If you are concerned about inadvertently duplicating course code in your submissions, try reading the course notes first, closing them out, and then coding yourself in a new environment or editor. If you get stuck, switch back again but avoid having both open at the same time.

Citing Sources

This section is based on an excellent [citation guide](#) created by Prof. Kyle Harms. We will largely be following these guidelines.

Any code that you did not write specifically for this class is considered to be external code. This includes example code from class, code from other classes at Cornell you wrote, and external code from web sites (e.g. StackOverflow). All code submitted for projects and homework assignments, unless otherwise indicated, must be your own.

No external code will be permitted. This includes importing helper libraries like jQuery. Standards for projects will be looser in terms of importing libraries - refer to assignments for specific instructions.

Any external code used must be cited within the source code with comments.

Late or Missing Work

[The following rules apply under normal circumstances. If you have experienced a personal crisis or a medical condition contact the Instructor as soon as possible. The earlier we hear from you, the more we can help. We can only provide assistance if we are made aware of the problem in a timely fashion. Do not wait until the end of term to disclose potential issues which might have reduced your grades.]

If you do not submit work before the stated deadline, then we will record a zero. There will be no exceptions. This policy is harsh, but it is necessary to support the kind of activities we do in the class. All assignment deadlines are known well in advance and have a long period for completion. For most students with accommodations, you should plan ahead and complete your assignment before the deadline. Assignments that are given over breaks will have a substantial lead time before the break. If you have concerns about assignments disrupting your ability to enjoy a break during the term, complete an assignment during the run-up period before the break.

Submitted files will be graded as-is and absolutely no excuses for mistaken submissions will be accepted. Verify on CMS that you have provided the correct files after submission. Any archive files must be in a format that can be opened by recent Windows and Apple OS X computers. Unopenable submissions will receive no credit. It is your duty to submit the correct files in a timely manner and verify that CMS has properly stored your submission before the deadline. Repeating, **it is your duty to submit the proper file for an assignment and verify that the version on CMS is what you intended to submit.**

In the very unlikely event that Canvas is down or you experience computer problems, you may email submissions to the course staff email address using your Cornell email account. You must email the file to the course staff email address before the homework due date - screenshots, file metadata, and git commit logs are too easy to modify.

Regrade Requests

You may request a regrade, which will be granted on a case-by-case basis. Please email the professor with your specific concerns. Accepted requests will receive a complete regrade by course staff. This means that every question will be graded again in detail. In the past this has resulted in both point increases and point reductions as new issues were discovered. The instructor encourages students to think carefully whether a 1-point regrade is worth the risk.

Regrades must be submitted within one week of the time in which homework was returned (no exceptions). For example, if homework was marked as "Graded" on CMS at noon on Thursday, then regrades must be emailed before noon on Thursday of the following week. No late regrade requests will be accepted.

On Decorum

Though it should go without saying, please observe respectful behavior while in class lectures. This includes remaining silent during lectures, answering questions posed to the class, and refraining from leaving during the middle of the lecture. Given the stress of the online environment, I ask that you follow the procedures in guidance outlined on the course web site.

Note on Inclusiveness

This course involves both self-directed assignments as well as in-class exercises. It is possible that in the course of this class you will encounter datasets, visualizations, or arguments that do not match your worldview or perhaps might even be upsetting. Course staff cannot guarantee such events will not occur, and do not want to hamstring the potential projects that teams can complete with a set of content requirements. Students must be respectful throughout the critique process and in-class activities, acknowledging that at times discussion can be fraught or argumentative. Course staff will not tolerate intentional displays of disrespect or marginalization during class time and out of class project work. Penalties will range from loss of participation grade to failure of projects/assignments to referral to university officials on a case-by-case basis.

Having experienced environments lacking in tolerance and inclusivity earlier in life, the Instructor will try their best to be mindful of potential issues with course content throughout the term. However, they might miss something objectionable,

inadvertently encounter an instance of implicit bias, or misspeak. If during the semester you have concerns about the way the course is going or are having a negative experience, please reach out to the Instructor directly.

Special Accommodations

We will make every effort possible to ensure that the class works for all students. Students who have self-identified to Cornell SDS as needing special accommodations in the classroom should contact the professor at the time of enrollment or during the first two weeks of class so that any course materials can be adapted, and other appropriate arrangements made. Failure to do so may prevent us from making the proper accommodations. Lectures will not be recorded unless SDS requires it. If there is a specific event that you are concerned about (such as an exam), please inform us at least two weeks in advance so that we have time to make arrangements.