INFO 4602/5602: Information Visualization

Tu/Th, 11:00-12:15, Ketchum 1B71

Prof. Danielle Albers Szafir
danielle.szafir@colorado.edu
Office Hours: Wednesday 10-11 & by appointment, ENVD 201

Course Description:
Data is everywhere. Charts, graphs, and other types of information visualizations help people to make sense of this data. This course explores the design, development, and evaluation of these information visualizations. By combining aspects of design, computer graphics, HCI, and data science, you will gain hands-on experience with creating visualizations, using exploratory tools, and architecting data narratives. Topics include interactive systems, user-centered and graphic design, graphical perception and cognition, data storytelling, and insight building. Throughout this course, you will work directly with stakeholders to analyze data from a variety of domains and applications.

Textbook:
Tamara Munzner. *Visualization Analysis & Design.*
The book is available online through the Libraries:
http://www.crcnetbase.com.colorado.idm.oclc.org/isbn/9781466508934

Hardcopies are available through Amazon or other online retailers.
https://www.amazon.com/Visualization-Analysis-Design-AK-Peters/dp/1466508914
http://bit.ly/2jjPd35

Additional readings will be made available through the course website

Topic Schedule:
(Subject to Change)

	Topics
Week One	Ways and Histories of Data Analysis
Week Two	Touring the Visualization Zoo
Week Three	Common systems, tools, & platforms
Week Four	Anatomy of a Visualization
Week Five	Analysis Tasks & Workflows

Project Hackathon #1	
Week Six	Principles of Visual Perception
Week Seven	Interaction
Week Eight	Handling Scalability
Week Nine	Design Studies
Week Ten	Evaluation Methods & Understanding Insights
Project Hackathon #2: Zayo Network Maps Challenge Final Project Pitches	
Week Twelve	Quantitative Evaluations & Experimental Design
Week Thirteen	Data Storytelling
Week Fourteen	Engineering End-to-End Visualization Systems
Week Fifteen	Final Project Work
Final Project Showcase	

Course Objectives & Outcomes:
 The purpose of this course is to enable students to design, construct, and evaluation visualizations, with an emphasis on user-centered design and system development.

Upon completing this course, students will:
- Understand the basic factors, workflows, and processes involved in creating effective visualizations
- Compare methods for visualizing data and understand how these different methods might guide users towards different conclusions
- Understand different ways of formally measuring trade-offs in different visualization approaches
- Develop a toolkit for exploring and communicating complex data using visualizations
- Construct interactive visualizations for the web using D3 and other popular platforms
- Conduct a series of design studies with stakeholders to develop novel solutions to current analytics challenges
- Understand design and engineering challenges for data-centered systems

Assignments:
This course will require regular participation both in class and on the course message board. For each week's readings, you will be expected to post either a small guided prototype or written reflection based on provided prompts directly on the course message board. You will

also respond to at least two (undergraduate students) or three (graduate students) responses or prototypes posted by other students as part of your participation grade. Unless otherwise posted, reflections and prototypes will be due on Tuesdays and responses will be due on Thursdays.

There will be no exams in this course, but you will be expected to contribute to three projects in small teams. Each project will require intermediate check-ins, a final submission and write-up (including confidential team evaluations), and a final presentation.

Late Policy:
All assignments and projects will be due by 11:59pm on the assigned due date.

Reflections & Prototypes:
Late reading reflections and prototypes will not be accepted for credit. However, you will be allowed to drop your lowest three scores from your overall grade. Similarly, late responses to prototypes and reflections will not be accepted for credit.

Projects:
Late projects will be deducted 10% for each day they are late. Projects will no longer be accepted after 72 hours.

Notice:
Extensions to assignment deadlines will only be granted in extreme circumstances. If you need an exception or extension to an assignment deadline for any reason, please let Dr. Szafir know as soon as possible and provide reasonable documentation as to the reason for your request. Extensions cannot be granted after the project due date.

Grade Distribution:
- Final Project: 25%
- Other Projects: 40%
- Written Reflections & Prototyping Assignments: 25%
- Class Participation: 10%

This course will use a standard, 100-point grading scale:

93.0% and above:	A
90.0%–92.9%:	A-
87.0%–89.9%:	B+
83.0%–86.9%:	B
80.0%–82.9%:	B-
77.0%–79.9%:	C+
73.0%–76.9%:	C
70.0%–72.9%:	C-
67.0%–69.9%:	D+

63.0%–66.9%:	D
60.0%–62.9%:	D-
Below 60.0%:	F

Accommodation Statement:

We are committed to providing everyone the support and services needed to participate in this course. If you qualify for accommodations because of a disability, please submit to one of your professors a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e‑mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Injuries guidelines under the Quick Links at the Disability Services website and discuss your needs with us.

Religious Observances:

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required assignments/attendance. If this applies to you, please speak with one of us directly as soon as possible at the beginning of the term.

Classroom Behavior:

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, ability, and nationality. Class rosters are provided to the instructors and TAs with each student's legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise us of this preference early in the semester so that we may make appropriate changes to our records. For more information, see the policies on class behavior and the student code.

Discrimination and Harassment:

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation.

CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the OIEC website.

Honor Code:

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy of the institution. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at honorcode.colorado.edu.

The first instance of academic dishonesty will result in a grade of 0 on the assignment in question. Subsequent violations will result in a failing grade for the course.