ATLAS 4519/5519: Visualization Design Studies
Tu/Th 2:20pm - 3:35pm

Nuts & Bolts:

Zoom Link:
https://cuboulder.zoom.us/j/95496903984
Meeting ID: 954 9690 3984
Passcode: ATLAS
One tap mobile
+12532158782,,95496903984# US (Tacoma)
+13462487799,,95496903984# US (Houston)

Instructor:
Danielle Albers Szafir
danielle.szafir@colorado.edu
Office Hours: TBD & by appointment at https://cuboulder.zoom.us/j/6268915969

Course Description:
Data visualization combines artistic and cognitive principles to help people explore, communicate, and analyze large datasets. Developing effective visualizations often requires working closely with interdisciplinary teams to authentically reflect the needs of a data problem. This course will provide a hands-on introduction to common design methods for creating visualizations in different domains. Students will work with a variety of datasets to generate visualization solutions for different problems leveraging various design methodologies and media. Topics will include data sketching and crafting, task-driven design, cognitively-driven design, and workshop methods.

Textbook:
Readings will be provided by the instructor. Please use the Campus VPN should you have any access issues: https://oit.colorado.edu/services/network-internet-services/vpn

Topic Schedule:
Subject to Change

Module One	Data Crafting
Week One *Aug 25 + 27*	Overview & Foundations of Visualization
Week Two	Data Sketching & Crafting

Sept 1 + 3	
Week Three *Sept 8 + 10*	Data Physicalization
Module Two	*Going Digital*
Week Four *Sept 15 + 17*	Basics of Altair
Week Five *Sept 22 + 24*	Designing Interactive Visualizations
Week Six *Sept 29 + Oct 1*	Data Storytelling
Module Three	*Design Studies Methods*
Week Seven *Oct 6 + 8*	Defining User Needs
Week Eight *Oct 13 + 15*	Participation & Iteration
Week Nine *Oct 20 + 22*	Methods for Evaluation
Module Four	*Cognitively-Driven Design*
Week Ten *Oct 27 + 29*	Learning from the Experts @ IEEE VIS
Week Eleven *Nov 3 + 5*	Perception & Cognition in Visualization
Week Twelve *Nov 10 + 12*	Experimental Design
Module Five	*Creative Visualization Opportunities Workshops*
Week Thirteen *Nov 17 + 19*	CVO Framework
Week Fourteen *Nov 24*	CVO Workshops for Final Project Ideation
Week Fifteen *Dec 1 + 3*	Reflection & Synthesis
Finals Week	**Final Projects "Due" 12.10**

Course Objectives & Outcomes:

The purpose of this course is to enable students to gain hands-on experience with a broad suite of methods for creating effective visualizations. Upon completing this course, students will:

- Analyze trade-offs in different approaches to building visualizations
- Decompose key elements of design problems for working with data across purposes and disciplines
- Understand the fundamentals of visualization design, including data representation, evaluation, and interaction, and apply these fundamentals to address specific challenges
- Develop a toolkit for exploring and communicating complex data using visualizations
- Construct interactive visualizations for the web using Altair

Assignments & Grading:

Grades in this course will be assessed as a combination of participation, module assignments, and a final project. All information about class assignments will be posted to the course Canvas page: https://canvas.colorado.edu/courses/66510

Participation:

This course meets over Zoom twice per week. During this time, you are expected to attend class, participate in discussions, and actively complete in-class activities. Participation will be graded as a combination of your participation in reading discussions and in hands-on activities. All participation activities must be submitted by 11:59pm the day of the class. There is no make-up for missed participation activities. While participation will be graded for each class session, your lowest two participation grades will be dropped.

Module Assignments:

This course will consist of a series of modules related to different methods. You will have one assignment for each module. Projects will be due on the second Friday following the completion of the module by 11:59pm. All assignments will be submitted through the course GitHub.

Late assignments will be deducted 10% for each day they are late. Assignments will no longer be accepted after 72 hours.
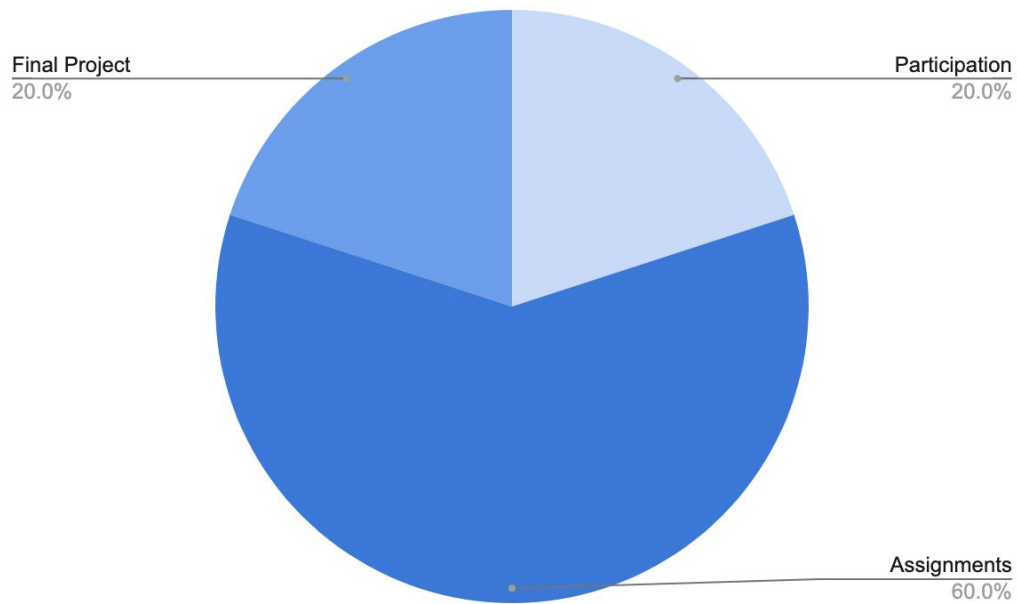
Final Project

You will also work either individually or in a small team to complete a final project on a topic of your choice. Details of the final project will be released in Week Twelve and will take the place of the final module's assignment. No late final projects will be accepted.

Extra Credit:

Module assignments may contain extra credit options that will allow you to go above and beyond the requirements for additional points. The presence and value of these options will vary per-module.

Grade Distribution:

Final Project
20.0%

Participation
20.0%

Assignments
60.0%

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

Policies & Commitments:

Requirements for COVID-19 & Other Illness:

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,

- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,

- clean local work area,

- practice hand hygiene,

- follow public health orders, and

- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert CU Boulder Medical Services.

Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policies on COVID-19 Health and Safety and classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the "Accommodation for Disabilities" statement on this syllabus.

Before returning to campus, all students must complete the COVID-19 Student Health and Expectations Course. Before coming on to campus each day, all students are required to complete a Daily Health Form.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the Health Questionnaire and Illness Reporting Form remotely.

In this class, if you are sick or quarantined for COVID-19 or any other condition, please let Dr. Szafir know as soon as is reasonably possible. Note that this applies to your role as a caretaker as well (see Family Support Statement below). I will work with you to accommodate your needs during the healing process. In such unusual times, your health should be your top priority and you should not be forced to choose between your learning and your well-being.

Technology Requirements:

Students in this course will benefit from having a laptop or tablet available for notetaking, in-class work, homework, and presentations. If you do not have access to a laptop or tablet, please consult with the instructional team. However, students and instructors alike are encouraged to quit mail and other applications that may be distracting; to turn off notifications and silence phones; and to put nonessential equipment away.

Open Discussion & Debate:
Adapted from Prof. Casey Fiesler's statement, with permission and thanks

In the classroom, students and instructors need to feel comfortable sharing their opinions and questions openly, even when we disagree. Disagreement is expected, but must be respectful and civil at all times. Students should feel welcome to share thoughts during class discussion without any fear of being disparaged for their opinions. Like yourselves, I also have opinions and will attempt to surface my own biases when appropriate. These disagreements or differences of opinion will not impact grades, as long as students are respectful. I invite students to meet with us to discuss concerns and ideas about how to make our learning community a positive experience for all.

This policy extends to topics in the course. Please feel free to reach out should there be any topics you'd like to discuss more deeply in class or that are not currently part of the course but you would like to see integrated. While I cannot guarantee that every request will be accommodated, I will do my best to make sure the curriculum and topics align with the needs of all of the students in the course.

Accommodation for Disabilities:
If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions]() on the Disability Services website.

Family Support Statement:
Adapted from Dr. Melissa Cheyney, OSU

CU does not have a formal policy on children in the classroom. However, I firmly believe that parents should not be forced to choose between family and education. Children are welcome during all class sessions.

The accommodations for illness stated above apply to your role as a caretaker as well: if you find yourself in a situation where you need to care for an ill family member, please let me know as soon as possible and I will work with you to accommodate your unique situation. I ask that all

students work with me to create a welcoming environment that is respectful of all forms of diversity, including diversity in family status.

Mental Health Statement:

Success in this course depends heavily on your personal health and wellbeing. **Recognize** that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. Your other instructors and I strongly encourage you to **reframe** challenges as an unavoidable pathway to success. **Reflect** on your role in taking care of yourself throughout the term, before the demands of exams and projects reach their peak. Please feel free to **reach out** to me about any difficulty you may be having that may impact your performance in this course or campus life as soon as it occurs and before it becomes too overwhelming. In addition to your academic advisor, I strongly encourage you to contact the many other support services on campus that stand ready to assist you.

Religious Holidays:

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 attendance. In this class, please alert Dr. Szafir of any such situations at least one week before any potentially conflicting deadlines.

See the [campus policy regarding religious observances](#) for full details.

Classroom Behavior:

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. 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 race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#)

Preferred Student Names & Pronouns:

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name. Know that I will do my best to use your preferred name and pronouns. Please correct me should I make any mistake with regard to your name or pronouns.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation:

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual

misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Honor Code:

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

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.