INFO 4907: DATA VISUALIZATION
Fall 2018

Instructor: Junhua Ding, Ph.D.  Lecture Time: Wednesday: 2:30pm - 5:20pm
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Course Pages

• Course management: Canvas: https://unt.instructure.com/login/ldap

Office Hours

• M, W: 1:30pm - 3:30pm (in office)
• or by appointment.

Textbooks


Objectives

Well designed Data Visualization would improve comprehension, memory, inference, and decision making. This course introduces techniques, algorithms and tools for creating effective data visualizations based on principles and techniques from graphic design, visual art, perceptual psychology and cognitive science. Emphasis is placed on the identification of patterns, trends, and differences among data sets.

The objectives of this course:

1. Students will be able to understand the fundamentals of communication and alignment around concepts required for effective data visualization.

2. Students will be able to select and use techniques, algorithms and tools for creating visualization of real-world data.

3. Students will become proficiency in creating static and interactive visualization for data from a variety of disciplines.

4. Students will be able to use data visualization to support decision-making and critical thinking.

Topics

The following is the tentative schedule with the covered topics. Actual schedule may be adjusted according to progress:

1. The Purpose of Visualization

2. Data and Image Models

3. Visualization Design
4. Exploratory Data Analysis
5. Perception
6. Interaction
7. Using Space Effectively: 2D
8. Spatial Layout
9. Deconstructing Visualizations
10. Color
11. Graph Layout
12. Network Analysis
13. Animation

Grading Policy

Grading will be based on assignments to be assigned as the course proceeds. Grades will be computed as follows:

- Assignments: 30%
- Project: 30%
- Midterm Paper: 10%
- Final Paper: 30%

Grading Scale: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 59 or below.

Incompletes

A grade of incomplete (I) will be given only for a justifiable reason (such as a serious illness or military service) and only if you are passing the course. It is your responsibility to contact the instructor to request an incomplete and discuss requirements for completing the course. If you do not remove the incomplete within the timeframe agreed upon with the instructor or within one calendar year, you will receive a grade of an F. Please refer to http://essc.unt.edu/registrar/academic-record-incomplete.html for more information.

Withdrawal

A grade of withdraw (W) or withdraw-failing (WF) will be given depending on your participation and grades to date. If you simply disappear and do not file a formal UNT withdrawal form, you may receive a grade of an F.

ADA Statement

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable
accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda. You may also contact them by phone at 940.565.4323.

Class Policy

- **Attendance Policy:** You are expected to attend class via GotoMeeting. You are responsible for announcements and assignments given in class. If you miss a class, it is up to you to obtain notes and any other information that was provided in the class. Those who do not attend class or review the recorded lectures in a timely manner can count on doing poorly in this course.

- **APA Style:** When doing the assignment, it is important to provide details of all the sources of information that you have used to prepare your work. All written assignments should follow APA (American Psychological Association) style to ensure that all sources are cited completely, correctly, and with consistency. The purpose of APA style is to (a). give credit to the author whose ideas or research you have used, (b). provide the exact location for sources of information used in the text of your paper, and (c). enable your reader to verify information you have provided or to explore your topic in greater depth. Consult the Publication Manual of the American Psychological Association, 6th edition.

- **Academic Dishonesty:** Students caught cheating or plagiarizing will receive a “0” for that particular assignment or exam (or specify alternative sanction, such as course failure). Additionally, the incident will be reported to the Office of Student Rights and Responsibilities, which may impose for further penalty. According to the UNT catalog, the term “cheating” includes, but is not limited to: (a). use of any unauthorized assistance in taking quizzes, tests, or examinations; (b). dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (c). the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; (d). dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or (e). any other act designed to give a student an unfair advantage. The term “plagiarism” includes, but is not limited to: (a). the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and (b). the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

- **Acceptable Student Behavior:** Student behavior that interferes with an instructors ability to conduct a class or other students’ opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student’s conduct violated the Code of Student Conduct. The university’s expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at www.unt.edu/csrr.

Advice for Doing Programming Assignments:

- **Start early.** You will hit snags, and you can count on a programming assignment taking longer than you think it should.

- **Finish early.** Do not wait until the deadline to finish up.
• **Test thoroughly.** The most common mistake among inexperienced programmers is to assume that their programs work after very limited testing. Try different kinds of inputs. Try unusual inputs. Be sure that you have exercised every part of the program. I recommend that you not do tests by hand. Instead, create a script that does a collection of tests automatically. That way, after each change, you can run the script and see that everything is still working, or at least find out what is not working. You can even create the test script before you write the program. Remember that fixing one thing sometimes ruins something else that used to work, so you want to rerun tests that worked before.

• **Do not give up.** You are going to encounter problems. Count on it. You are not the only one who has difficulties writing computer programs. Do not throw in the towel at the first snag. If something is wrong, first determine what it is, then fix it. If you cannot see how to diagnose or fix the problem, ask for help.

• **Do what the assignment asks for.** Do not make up your own assignment. If you decide to make temporary modifications to aid in development, be sure that you go back and repair them before turning in the assignment. Reread the assignment before turning in your work. Pay attention to details.