INF 385T – Advanced Visualization Environments
Fall 2019

Unique ID: 27254
Room: ACB 1.114
Time: Wednesday 12:00-15:00

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Contents

1 Objectives

Through this course, students will develop:

- theoretical knowledge of the research areas of Data and Information Visualization
- practical skills for designing, building, and evaluating interactive visualization applications for Visualization Environments that use multiple systems, including: augmented reality, virtual reality, large display walls, motion tracking, etc.

2 Course Structure and Organization

This course has three parallel narratives:

- Independent readings
- In-class discussions and presentations
- Final group project

All students are expected to complete the weekly reading assignments before class time. Reading assignments include book chapters, research papers, and online tutorials.

ALL students are expected to read and understand ALL assignments, and participate actively in the class discussions

Students will form groups of 3-4 members, and complete a project in interactive visualization applications for Visualization Environments. Each group can select either a "study project" or a "system project" (the project must be approved by the instructor).

- Study projects require conducting a **robust study** of how different visualization technologies impact specific users, groups, or organizations.

- System projects require developing a **functional application** that employs at least three visualization systems and conducting a basic evaluation[1].

The final project requires considerable out-of-class time

This course structure aims to create a learning environment where questions, concepts and skills are discussed, analyzed, and developed collaboratively. This format depends on the participation of all class members. Therefore, all students are expected to:

- Attend all class sessions; if a student misses a class, it is his or her responsibility to obtain all notes, handouts, and assignment sheets.

- Read all material prior to class; students are expected to complete the readings, and participate actively in all class discussions and group activities.

- Submit all assignments fully and on time. Late submissions will not be accepted (in the event of an emergency, students must contact the instructor).

- Educate themselves and their peers. The successful completion of this course and their participation in the information professions depend upon the students' willingness to demonstrate initiative and creativity.

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[1] Section 7.4 provides more details about the projects

3 Academic Integrity

University of Texas Honor Code

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Academic dishonesty, such as plagiarism, cheating, or academic fraud, will not be tolerated and will incur severe penalties, including failure for the course. If there is concern about behavior that may be academically dishonest, consult the instructor. Further information about plagiarism and its consequences can be found at:

http://deanofstudents.utexas.edu/conduct/standardsofconduct.php

4 Documented Disability Statement

Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 471-6259 (voice) or 1-866-329-3986 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations.

5 Amendments to Syllabus

The instructor reserves the right to make amendments to the syllabus as the semester progresses in order to improve it, and to respond to unexpected events.

6 Reading Assignments

- The instructor will provide students with a list of all readings including research papers, online tutorials, and other scholarly materials. Many of the reading materials are can be accessed online.

7 Important Dates

	Week	Topic
Aug 28	1	Syllabus, and Introduction to HDI lab
Sep 04	2	First readings
Sep 11	3	Readings 1. AR/VR
Sep 18	4	Readings 2. Large Display Walls
Sep 25	5	Conceptual Design **Project Idea, Goals and Justification)**
Oct 02	6	Scientific Visualizations 1
Oct 09	7	Unity on Rattler **Project Plan**
Oct 16	8	Scientific Visualizations 2
Oct 23	9	Motion Capture System
Oct 30	10	Sage2
Nov 06	11	**Project Follow Up**
Nov 13	12	
Nov 20	13	
Nov 27	14	THANKSGIVING
Dec 04	15	
Dec 11	16	
TBD		FINAL PROJECT System Demo Presentation Paper

8 Grading

The Letter Grade for the course is determined based on **minimum grade requirements** AND the **final numeric score**.

Minimum letter grade requirements

Letter Grade	Numeric Score	Minimum Requirements
A	96 - 100%	
A-	90 - 95%	• System projects: must be functional and meet all the specifications. • Study projects: all the proposed studies and observations must be completed, including an *in depth* data analysis.
B+	87 - 89%	
B	84 - 86%	
B-	80 - 83%	• System projects: system must function at least partially, meeting the most important specifications, and provide a proof of concept. • Study projects: all the proposed studies and observations must be completed, including a *basic* data analysis.
C+	77 - 79%	
C	74 - 76%	
C-	70 - 73%	• System projects: Technological platform must be functional. • Study Projects: IRB proposal is complete.
D+	66 - 69%	
D	60 - 65%	• All group members have a valid IRB training certificate.

(higher grades must meet all the minimum requirements of lower grades)

Final Numeric Score

The final numeric score for the course is computed based on the five deliverables for this course:

5%	Class Participation	(individual)
30%	Reading Assignments	(individual)
30%	Presentations	(individual)
30%	Final Project	(group)
5%	Peer Evaluation	(individual)
100%	**Final Numeric Score**	

8.1 Class Participation (Individual)

All students are expected to participate in class activities and discussions.

8.2 Reading Assignments (Individual)

The goal of the reading assignments is that every student develops an overarching view of the research areas that contribute to the field of Data and Information Visualization.

Every student is expected to read all the reading assignments, understand them, and participate actively in the class discussions.

Additionally, every student must submit 3 reading points for every reading assignment. Reading points should be 2-4 lines of text.

- Point 1: identify the strengths of the reading
- Point 2: identify the weaknesses of the reading
- Point 3: discuss the implications of this work

Reading points must be submitted 24 hours before class starts

This strong deadline is necessary in order to anonymize, combine, and sent them to the student in charge of presenting the paper in order to facilitate the in-class discussions.

8.3 Presentations (Individual)

Each student will be assigned to present at least **2 research papers** (this will be modified depending on how many students register for the class). Students are expected to present the papers by conducting 3 roles:

1. Hunter-Gatherer – explain the paper's background and discuss the context:
   who, *where*, *when*, *what* of authors, project, and research area

2. Reviewer – explain the paper. Specifically, the presenter must:
   a. Present a **brief synopsis**
   b. Discuss the strengths and weaknesses of work
   c. Identify the major contributions and the take home lessons

3. Lead discussant – guide the in-class discussion based on the *discussion points* that all the other class members submitted.

It is expected to have a visual presentation support for the *hunter-gatherer* and *reviewer* components of the presentation

8.4 Project (Group)

Early in the course, students will form groups of 3 or 4, and define their idea for a course project. Each group has the choice to conduct a "study project" or a "system project". Groups will work in their project throughout the course.

While each group is responsible to come up with a project idea, it is the instructor who approves the ideas. If groups cannot identify an appropriate project idea, the instructor will provide a set of default project specifications.

It is required that all students have a valid IRB training certificate

8.4.1 Study Projects

In accordance to university regulations, each group conducting a study project must complete an Institutional Review Board (IRB) Research Proposal in order to evaluate their systems. This proposal needs to be completed early enough such that the group is able to submit it, have it approved, and conduct the experiments and/or observations. A study project requires conducting a robust study including an in-depth analysis.

8.4.2 System Projects

Groups conducting a system project must **design and implement a functional system** that illustrates how their interactive visualizations support the goals of the target users. It is also expected to conduct a basic system evaluation.

While students have certain flexibility choosing the specific topic of their projects, they must meet the logistical and technological requirements expressed in class.

8.4.3 Final Presentation and Demonstration

The purpose of the presentations and demonstrations is to showcase the students' capacity to communicate their work in a professional way.

- Groups conducting a "study project" must have a poster.
- Groups conducting a 'system project' must have a live system demonstration.

8.4.4 Final Paper

The purpose of the final paper is to show the students' capacity to communicate their work in writing. It must be scholarly structured, have a **coherent story and convincing argumentation**.

**Final papers are due on the day of the Final Exam
as scheduled by the university**

The final paper must be written as if it was going to be submitted to a major conference such as IEEE Vis, CHI, UIST, etc. As such, reports must follow the specifications set by the particular conference, including using the appropriate format.

The final paper must be 8 pages long, following the professional format of the conference (ACM, IEEE, etc.). Papers must have an appropriate number of references (25+). Groups are encouraged to use the reading assignments as well as additional papers that were not covered in class.

8.5 Peer Evaluation (Individual)

In order to assess how each student performed in his/her group, all students must submit a brief evaluation of their teammates at the end of the course. These evaluations are a critical aspect of the course.

**Failure to submit a peer evaluation will result in a 5 point deduction
from the final grade**

9 Writing Guidelines for Papers and Reports

- **FOLLOW THE FORMATTING GUIDELINES.**

- **Proof read your paper**. Proper spelling and grammar is expected.

- **Write a good abstract**. The abstract should allow readers and reviewers to make a first assessment of the paper quickly. Some people recommend having four sentences in the abstract: The first states the problem. The second states why the problem is a problem. The third is the startling sentence (the discovery, solution, or contribution). The fourth states the implication of the startling sentence.

- **Papers should be self-contained**. All the contents and argumentation should be included in the paper without assuming the existence of appendices. If you wish to provide additional information, you can publish your appendices on the Web and provide a reference to the URL's in the reference section or as a footnote.

- **Provide a convincing argumentation**. Authors have to present and argue for their ideas in a convincing and coherent manner.

- **Support your claims.** When making claims or presenting design decisions, it is not sufficient to just present them. It is necessary to support your claims, provide references and justify your design decisions.

- **Structure your paper properly**. It is expected that the papers are properly structured into sections and subsections.

- **Provide all required sections**, including Categories and Subject Descriptions, General Terms, and Keywords.

- **Encapsulate concepts into paragraphs**. Avoid having overly long paragraphs. Short paragraphs make the paper more accessible and give readers more places where to stop and think about the concepts and ideas expressed in the paper.

- **The reading should flow**. Do not write the paper as bullet list or telegraph.

- **Avoid having empty sections** between headings and subheadings (e.g., having the heading for section 5.1 immediately after the heading for section 5 with no text in between). This usually means that there is a missing introduction/overview of the whole section, or that the paper can be structured and organized better.

- **Respect the copyright notice space**. You can modify or delete the text of the copyright notice, but respect the space allocated for the notice. When publishing a paper, the copyright notice will be added, shifting the rest of the text, which in turn can cause annoying layout issues (e.g., figures out of place, etc.).

- **Respect the specified length of the papers**. The maximum number of pages is all you get. Documents longer than the maximum page limit are not appropriate. Shorter papers indicate a lack of content.

- **Check your references.** Format your references appropriately.

Think about the communicative goals for your paper and your target audience