CS677 Human Computer Interaction/ Virtual Reality

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Office Hours: WF: 11am-12 noon. Tuesday/Thursday: 8:30 p.m.-9 p.m.

1 What is involved

Welcome to the eighth offering of the Human Computer Interaction or Virtual reality course at CU-Colorado Springs.

We will study issues related to this interdisciplinary field. The book by JC Heudin on Virtual Worlds would provide the basis for the course. Other prevalent topics such as force/tactile feedback, sense of smell, touch, and sound will also be covered using a variety of course materials. Dr. Krueger’s book on Artificial Reality, Burdea & Coiffet’s VR Technology are the other texts books covered.

In addition, advanced technical aspects of the course will also be specified by covering a variety of PRESENCE, SIGGRAPH, and other graphics journals (e.g. IEEE CG&A) in this area. The needs and future research directions would be identified.

This course involves a major term project. All the projects would be implemented on Silicon Graphics systems, or equivalent systems. We have several VR resources available in the department: World Tool Kit (WTK)(TM) with CrystalEyes 3D Tracker, PHANToM (TM) force feedback device by SenseAble Corporation for sense of touch experiments, and Maya Unlimited
(AliasWavefront)(TM) for graphics Virtual Worlds. At this time, SGI machines are the most advanced systems for graphics in the department, and all the VR equipment works only on these systems. For convenience, these systems are also available through the phone lines, or other terminals for development of the code. Please talk to me about your project as early as possible. The term papers, based upon the projects, are to be presented in class during the last few weeks of the term.

I am attending a conference/panel and would miss February 1st, 3rd, and March 1st classes, the dates for missed class is scheduled for Saturday February 26th 2005 at 9 am-11:30 am. In case of other weather related cancellations or other scheduling conflicts, Saturday April 2nd, 2005 9:11:30 am is another backup date if needed. Please make a note of it.

## 2 The Term Project: 50 Percent

A student would work in a group of maximum of two students. While selecting a group partner, please make sure that a convenient time-slot can be arranged so that you could meet without any time conflicts.

The term project would also involve a written report on the results of your project. The suggested size of the report is around 15-20 pages, and would result in a proceeding for this class. I would talk about the format later in the course. This report is due by May 5th, 2005. There are following deadlines for the term project:

1. A one page Project Proposal due by February 11th(3%). A brief and informal (ten minute) presentation by every student-group would be given in the following week. The class discussion dates are February 8th and 10th, 2005.

2. Mid-term project presentation (15-30 minutes per group) due March 18th (in class summary) and demonstration (13%) (by March 18th, 2005).

3. Final Demonstration (20%) and Presentation (April 28th-May 5th, 2005) (7%), and typed term-paper report (7%). Demos to take place in the week of April 28th - May 5th, 2001.
A time slot of approximately 30-45 minutes would be given to every student-group. Although it will depend upon the topic of the project, and the student’s style of presentation, the presentation should cover a brief survey of existing methods, the method used, implementation details, conclusions, and future research. Please prepare transparencies for the presentation. A transparency projector will be available during these presentations.

The following is a suggested list of topics which would be covered in the class as well as could be selected as term projects:

1. Interactive Web-Surgery Simulation
2. Avatars and Humans in Virtual Worlds (Web-Avatars)
3. VR for People with Disabilities
4. Fast Interactive Volume Rendering Techniques
5. 3D-Sound Experiments
6. Extracting 3D information from video-taped sequences, using morphing, vision, or geometric algorithms.
7. Networked-VR
8. 3D Video Games
9. Force Feedback Devices
10. Unencumbered Virtual Environments
11. Non-verbal information processing
12. Camera based virtual environments
13. Artificial life and complexity in virtual environments
14. Web3D applications

Please select a topic as early as possible. Once you select a topic, please let me know, so that I could provide you with some references in that area.
3 The Mid Term: 25 percent

Will be an in class exam on March 15, 2001. The exam will be based upon whatever was covered till that point in the class.

4 The Final Exam: 25 percent

The take home will be given on April 28th, 2005. Two weeks will be given to complete the take-home final. The take home final exam is due on May 10th, 2001 by 10 p.m.

5 Department Policy on Late Drop

A late drop will be approved only if there is documented evidence that the student was prevented from attending a significant number of classes by circumstances beyond his or her control.

6 Office Hours

Please feel free to ask questions, as they occur, during and after the class hours. However, if I am busy outside the office hours then I would say so and ask you to come at some later time.