CS677 Human Computer Interaction/ Virtual Reality

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Office Hours: W: 11am-12 noon. Tuesday/Thursday: 7:15 p.m.-8:15 p.m.

1   What is involved

Welcome to the ninth offering of the Human Computer Interaction or Virtual reality course.

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. A working demonstration is required of all term projects. All the projects would be implemented on systems of student's choice with approval from the instructor. We have several VR resources available in the department: PHANToM (TM) force feedback device by SenseAble Corporation for sense of touch experiments, and Maya

Unlimited (AliasWavefront)(TM) for graphics Virtual Worlds. 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.

Back-up classes are scheduled for Saturday March 17th 2007 and/or April 7th, 2007 at 9am-10:15 am in case of weather related emergencies or my absence due to trip or illness.

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 4th, 2007. There are following deadlines for the term project:

1. A one page Project Proposal due by February 8th (5%). 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, 2007.

2. Mid-term project presentation (15-30 minutes per group) due March 23rd (in class summary) and demonstration (10%) (by March 23rd, 2007).

3. Final Demonstration (20%) and Presentation (May 1st-May 3rd, 2007) (5%), and typed term-3paper report (10%). Demos to take place in the week of May 1st and 3rd, 2007.

A time slot of approximately 25-30 minutes would be given to every student or group. Although it will depend upon the topic of the project, and the student's style of presentation, the presentation and term report 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. Motion generation, tracking, and avatars.

15. facial expressions and speech generation of synthetic actors.

16. Wearable and mobile 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, 2007. 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 26th. Two weeks will be given to complete the take-home final. The take home final exam is due on May 10th, 2007 by 7 p.m. The final exam can be submitted electronically as pdf or word file, or by hand in paper format.

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.