1 What is involved

Welcome to the third offering of the Wearable Computing and Complex Systems course at CU-Colorado Springs.

We will study issues related to this exciting interdisciplinary field. Wearable Computing is defined as the next generation computing which is expected to seamlessly blend computing with the human-body. New miniaturized devices are appearing in the market, leading to awareness of computing which can extend the boundaries of human-computer interaction. Miniaturized head-mounted displays and eye-glasses, watches, jackets, and PDAs are some examples of such technology combining Virtual Reality with VLSI technology.

Complex Systems provide a basis for pursuing non reductionist approach and are inherently well suited to study the complex interaction as wearable computing becomes part of daily computing. Complex systems research is expected to provide a new insight in developing and designing wearable-technology.
Back-up classes are scheduled for Saturday February 4th, 11, and/or April 8th, 2006 between 9 am-11:45 am in case of weather related emergencies or my absence due to trip or illness. Please mark your calendar at your earliest convenience.

We will be covering material from:

- Proceedings of Sixth and Seventh IEEE Symposium on Wearable Computing, Oct 2002, Seattle, WA.
- The Dynamics of Patterns Rabinovich, Ezersky, and Weidman (Selected Chapters 1, 12, 13, 14, Appendix A, B).
- Summary from the book: Lessons from the Living Cell Stephan Rothman; From being to becoming: Time and Complexity in the physical sciences by Illya Prigogine; and The end of Certainty by Iya Prigogine.
- Technical articles from IEEE Computer, Presence, and SigGraph journal.
- L-Systems and Algorithmic Beauty of Plants.

A Wearable Computing Laboratory started in Spring 2004 (www.cs.uccs.edu/ semwal look for Wearable Computing Lab). We have the NoMAD head gear. Tiny OS system is also available for project implementations. PDA and wearable notebook based projects are welcome. In addition, ARToolKit provides mixed reality platform.

2 The Term Project: 50 Percent

This course involves a major term project. 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 9th, 2006. The following are deadlines for the term project:
1. A one page Project Proposal due by February 2nd, 2006 (3%). A brief and informal (ten minute) discussion/presentation by every student-group would be given. The class presentations dates are February 7th and 9th, 2006.

2. Mid-term project presentation (15-30 minutes per group) due March 23rd and April 4th (in class summary) and demonstration (13%) (by March 23 or April 4th, 2006).

3. Final Demonstration (20%) and Presentation (May 2nd and 4th, 2006) (7%), and typed term-paper report (7%). Demos to take place in the week of May 1st - May 5th, 2006.

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 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. Wearable Mobile games
2. New Sense of touch wearable computing for defense and Physical Safety Issues
3. Wearable Medical Devices
4. Augmented Reality
5. Wearable Clothing devices
6. Wearable Computing for People with Disabilities
7. Medical Wearable Computing
8. Physical security applications of wearable computing
9. Non-verbal information processing in Wearable Worlds
10. Wearable Toy-Interfaces

11. Cyberspace Security with Wearable Computing

12. Complex Systems and human computer interaction

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 additional references in that area, if needed.

3 The Mid Term: 25 percent

Will be an in class exam on March 16th 2006. 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 25th, 2006. The take home final exam is due on May 9th, 2006 by 7:15pm - 9:45 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.