

## **San Jose State University**

### **A Course on the Human-Computer Interface**

#### **Principal Investigators:**

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#### **1. Overview of Goals and Objectives:**

Their are three primary goals to this project:

- 1) To develop a course on the design of new human-computer interfaces. There are many textbooks and courses devoted to human-computer interaction (HCI). However, very little of the content, if any, is devoted to the design of the actual interface itself. This course teaches students about a subset of HCI known as the human computer interface. Its focus is on how information about the human is delivered to the computer (computer controllers), how information about the computer is delivered to the human (computer displays), and how these inputs and outputs can be customized to an individual user or application.

This course, designed for Electrical and Computer Engineers and Computer Scientists, includes topics ranging from cutting-edge computer controllers and 3D audio and video displays to real-time signal mapping from computer input to output. Since this course is taught over ISDN networks, students are able to learn about and participate in the virtual reality / multimedia research of 5 different universities.

Two demonstration applications are used throughout all the lectures in the course to provide an opportunity for the students to see the principles discussed in the lectures.

Radio Baton (Position Sensing Input) --> Gesture Recognition --> Music  
Synthesis --> 3-D Audio Display

BioMuse (Bioelectric Sensing Input) --> Pattern Recognition --> Virtual Hand  
/ Virtual Reality Environment

- 2) To create a multi-university distance education partnership. A course on human-computer interfacing is too broad and requires too much equipment for any single university to have the expertise and resources necessary to teach it. The research of 5 universities and over 7 researchers has been brought together to teach this class.
- 3) To create student project teams to solve "real-world" human computer interface problems. Many other departments, organizations, and companies are contributing project topics. Students from other departments such as art, music, and occupational therapy are participating as "consumer/consultants" to help project teams.

#### **2. Current Status and Accomplishments**

The project, to this point, has exceeded all expectations. The web page (<http://www-engr.sjsu.edu/electeng/faculty/knapp/hci.html>) has already over 100 pages of content. The course has just started and is being taught live via ISDN at Princeton University, San Jose State University, and Stanford University. (The course was only proposed to have 2 sites.) The Naval Postgraduate School is taking the class "asynchronously". University of California, Davis is providing some lectures, and will participate online until next year.

The laboratory experiments are being finalized, with the first laboratory scheduled to be taught the second week of October. Additionally, we have received more donations than expected, allowing us to purchase more workstations and interface devices than expected, making for an even better laboratory environment at the universities.

The list of possible projects will also be completed by the second week of October. Projects are already being proposed that will require inter-university collaboration.

### **3. Plans for Remainder of Project:**

After successful completion of the course this fall, we will be expanding course material; looking at the evaluations from the students, industry, and project team consultants; and soliciting more corporate involvement for the second teaching next fall. We are also already in the process of signing up a publisher for the textbook/CDROM that will eventually accompany the class.

### **4. Materials That Have Been Developed:**

As mentioned previously, there is over 100 pages of Web content (<http://www-engr.sjsu.edu/electeng/faculty/knapp/hci.html>) already developed. There is also a lab manual that has been started

### **5. Dissemination Activities**

Dissemination is ongoing in five areas:

- 1) web page,
- 2) book/CDROM preparation,
- 3) corporate involvement,
- 4) press releases, and
- 5) conference presentations.

### **6. Evaluation Activities:**

As discussed previously, there are ongoing student evaluations. After the course finishes, evaluations will be solicited from project contributors (organizations and corporations as well as professors). We will also start asking other universities to examine the course material and see if they would like to be involved in the next teaching.

### **7. Benefits Seen and Expected:**

The student (and professor) excitement surrounding this class has been incredible. Students are already reporting that they feel privileged to listen to lectures from outstanding human-computer interface researchers from around the country. We already have several students interested in doing projects that will aid both physically and cognitively disabled computer users.

We also have already seen some of the advantages and obstacles involved in team teaching across the continent. We expect this course to be used as a model for resource sharing (both intellectual and capital) for future high technology courses.