CSCI 3160: User Interface Design

Dalhousie Faculty of Computer Science

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CSCI 3160: User Interface Design

Objectives

This class deals with concepts and techniques underlying the design of interactive systems. Both human factors and the technical methods of user interface design are covered. Students will learn how to apply various techniques through the design, creation, and testing of a prototype system.

Teaching Perspective

The first goal of this course is to teach students how to develop programs for applications in which the user experience is a central issue. The course will use a hands-on approach to introduce techniques and tools to support a an iterative user centred software lifecycle consisting of

- requirements gathering

- design

- evaluation

- prototyping

- testing

- refinement

A secondary goal will be to raise awareness in our students of the importance of design that accounts for users' physical, behavioural and information processing characteristics and requirements. Experience has shown

that failure to deal with such characteristics can lead to wasted functionality, user frustration, inefficient practices, discomfort and error-prone activity.

Students will develop the following basic skills:

- abstract task analysis

- design specification

- user testing

- critical evaluation of results of user testing

- working in small groups to develop programs

Intended Audience

The intended audience includes third- and fourth-year undergraduate students.

Related Courses

Prerequisites

- CSCI 2110 (Computer Science III)

- CSCI 2132 (Software Development)

Co-Requisite

- We recommend, but do not require, CSCI 2140 (Data and Knowledge Fundamentals)

Anterequisite

- This course is a prerequisite for CSCI 4163 (Human-Computer Interaction)

Note

- This course is not related to CSCI 4165

Hardware/Software Requirements

Students are likely to use standard software and the usual labs for much of the course. However many of them are likely to use the computers and recording equipment that should be in the Usability lab.

Informed Consent

Evaluation of student projects will require volunteers. Dalhousie's policy is that such participation requires informed consent by participants and ethical review by the Faculty's Ethics Review Authority.

Schedule

3 hours of lectures per week.

Topics

1. Introduction to HCI (3 hours)

   what is HCI, why we need it

   how it fits into software design

2. Introduction to usability engineering and project (2 hours)

   - Usability Engineering lifecycle models
   - Items of production

3. Models of usability (2 hours)

4. Basics properties of users (4 hours)

   - sensation, perception, cognition, and motor skills
   - memory, reasoning and information processing, expertise

5. Interaction styles (3 hours)

   - Menus,
   - Form fill-in,
   - Command line interfaces,
   - Direct manipulation,

- Novel interfaces (e.g. haptic feedback)

6. Evaluation of user interfaces (8 hours)

  - Testing without users
    - Guidelines and heuristics
    - Scenarios and cognitive walkthroughs
  - Prototyping
    - Paper prototypes
    - Web prototypes
    - Code prototypes

7. Design methods (8 hours)

  - Formative evaluation
  - User and feature analysis
  - Task analysis
  - Prototyping

Rationale

There are a number of reasons that it is appropriate to introduce such a course now.

- Students who are deeply interested in human factors need more than we can teach them in one undegraduate course. CSCI 4163 could be a true specialty course if students had more background before taking it.

- Our students should have exposure to human factors to develop breadth and to give them an opportunity to specialize in their final undergraduate year. The proposed course will provide such an opportunity.

Textbooks

Required

- *Interaction Design: Beyond Human-Computer Interaction* by Preece, Rogers, and Sharp, (John Wiley & Sons, Inc., 2002).

Recommended

- *Human-Computer Interaction* by Dix, Finlay, Abowd, and Beale. (Prentice-Hall Europe, 1998).

- *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (third ed.) by Shneiderman, (Addison-Wesley, 1998).