

CS 5551: User Interface Design (4)

Catalog Description:

Design and layout of interactive programs using menus, dialogs, and the event loop. The use of color, text, fonts, and bitmaps; giving user feedback and help. Rapid prototyping and interface management systems. Design for accessibility and usability.

Textbooks: Ben Shneiderman, *Designing the User Interface*, 3rd Ed. Addison Wesley, 1998.

Douglas A. Young, *X Window Systems Programming and Applications with Xt, OSF Motif Edition*, 2nd Ed., Prentice Hall, 1994.

References:

Course Goals:

This course provides an introduction to the theory and practice of designing a user interface to an application program. The theoretical part will cover general principles, theories, and guidelines for interface development, software tools, direct manipulation and virtual environments, multiple-window strategies, and information search and visualization. The practical part will involve discussion of and programming in the X Window System, including the X resource manager, using widgets (manager widgets, menus, dialogs), handling events, using color, graphics contexts, handling graphics images, text, and using the X graphics primitives.

Prerequisites by Course & Topic

CS 2511: Software Development – use of software libraries, design of large-scale software, basic user interface concepts

MA 1297: Calculus II – vectors, transformations

Major Topics Covered in the Course

- Design, layout, and implementation of a user interface
- The software architecture of a graphical user interface system
- Implementation of common interaction techniques
- The software development process for user interfaces
- Human factors issues in user interface design

Class/Laboratory Schedule: Lecture: 3 hours per week, Laboratory: 1

Laboratory Projects

- Introduction to callbacks and the translation manager (1)
- Using the resource database (1)
- Primitive widgets and callback lists (1)
- Manager widgets and a small application program (2)
- Menus and context-sensitive help (2)
- Dialogs, events, and color (2)
- Visual classes, bitmaps (1)
- Output primitives and rubber-banding (1)
- Cut, Copy, Paste, and the clipboard (1)
- Course project – apply user interface design methods to implement a new application or to add functionality to an existing application (3)

Course Contribution to Program Objectives and Outcomes:

1. Students learn to design, lay out, and implement a graphical user interface using components from a hierarchical widget library. (*b, d, e*)
2. Students understand and can utilize the software architecture of a graphical user interface system. (*d*)
3. Students can implement common interaction techniques. (*b,d*)
4. Students can apply standard software development processes to user interface design. (*d*)
5. Students increase their ability to work independently on challenging software problems. (*e*)

Estimate CSAB Category Content

	CORE	ADVANCED
Data Structures		
Algorithms		
Software Design		2

	CORE	ADVANCED
Computer Organization and Architecture		
Concept of Programming Languages		

Solution Design

There is discussion of common user interface design methods, and how they can be applied in the construction of a graphical user interface. The students apply their designs to implement solutions to small user interface problems, and to a substantial user interface problem as the course project.

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