Computing Science Syllabus Autumn 2002

31N5: Multimedia and Human-Computer Interaction

Lecturers
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Prerequisites
3133 or 3193
(319N may not be taken prior to, or concurrently with, this unit)

Learning Outcomes
The course aims to cover Multimedia and Human-Computer Interaction, or how computers and people communicate. It also aims to provide substantial practical experience of using specialised interface development tools, processing audio and image files, developing multimedia presentations, and advanced Java programming using Java’s multimedia capabilities. Thus, after taking this course, students should have developed the following skills:

- An understanding of concepts in human-computer interaction
- An understanding of cognitive psychology issues as far as they concern HCI
- Analysis of real user interface needs for concrete software systems
- Design of user interfaces with a strong focus on the visual aspects of information presentation
- Appreciation of interface implementation and evaluation issues
- Appreciation of the standards for representing audio files
- Appreciation of the standards and issues concerned in representing static/dynamic visual input/output
- An understanding and practical experience of aspects of multimedia design
- An understanding of the tools available to produce multimedia
- Further experience with advanced Java programming
- Experience with using the Java libraries for multimedia purposes.

Contents
The lecture topics are as follows:

Designing the User Interface 12 Lectures
- Motivations for human factors in design: safety-critical systems, industrial and commercial uses, office, home, and entertainment applications.
- The place of human factors, usability and interface design in the software life cycle.
- Adjusting the computing environment to the user (accommodation of human diversity): cognition, perception and physiology.
- Mechanisms of interaction with machines (I/O devices [mouse, keyboard, VDU, ...], interaction styles [command line, menus, GUIs, VR]).
- Usability, completeness, consistency: the design of the user interface
- Evaluating the user interface.
- Usability testing
- Use of interface design tools
- Java interface design facilities
Graphics
- Colour and the production of colour on graphical output devices
- Graphical representation and techniques
- File formats of static and dynamic images: standards, uses, data compression, quality
- Principles of animation: model design, animation design, production
- Java graphics APIs

Multimedia Authoring and Design
- Project design: setting up, requirements, navigation, storage, delivery
- Authoring tools: history, comparison of different approaches, functionality and principles
- Case studies (eg. Toolbook, Authorware, Director, Shockwave, Flash)
- Applications (eg. kiosks, distance learning, web-based)

Sound
- Auditory input and output: standards and techniques
- Quality of service and usability in sound

The course also includes tutorials and a substantial practical component, which will complement the lectures. Practical sessions will cover the use of specialised user interface development tools, audio editing software, image processing software, animation software, and multimedia authoring software. There will also be a substantial amount of Java programming, at an advanced level, using Java’s interface design and multimedia capabilities.

Assessment
Assessment is from two assignments (25% each) and an exam (50%). The first assignment will be the design and implementation of a user interface; the second assignment will be the creation of a multimedia application. If you do not submit an item of coursework, or you do not attend the exam, you will receive zero marks for that component of the assessment.

Textbooks
Recommended reading includes:


