The HCI Emphasis at UC Berkeley's SIMS

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ABSTRACT
HCI education at the School of Information Management and Systems is focused primarily in the masters program. This article describes the HCI emphasis and the relevant courses currently offered at SIMS.

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INTRODUCTION: ABOUT SIMS

HCI education at the School of Information Management and Systems at the University of California, Berkeley is focused primarily in the masters program. This is a professional masters degree, akin to those awarded to MBAs, as opposed to a research-oriented degree. Most of our masters students return to graduate school after several years in the working world with the goal of becoming an IT professional. Graduates of the masters program take jobs in a variety of IT roles in the public and private sector. At SIMS, HCI is an emphasis rather than an explicit program, but it has become one of the central and most popular emphases in the school.

Recently the school adopted a framework for describing our endeavors, consisting of five areas of emphasis. These are: HCI, Information Design and Architecture, Information Economics and Policy, the Sociology of Information, and Information Assurance. Each of these areas has a set of recommended courses for students interested in that track. Subject matter included in these areas but not obvious from the area names include privacy and security (from a technical and a legal standpoint), intellectual property (also from both technical and legal standpoints, with an emphasis on preserving fair use), project management, database design, distributed and networked systems (with an emphasis on the technical, economic, and legal aspects of peer-to-peer networking), and document engineering, which has to do with using modeling techniques in conjunction with standardized markup languages (primarily XML) to organize information flow.

A key aspect of the program is the capstone final project, completed in the last semester, which is a substantial project, usually done in teams of 3-4 students, that ideally combines knowledge and skills obtained from throughout the program. Most students build a system, usually to meet the requirements of an outside client or customer, although some students write policy papers and others get involved in research with faculty. Often the execution of these projects makes use of user-centered design, including identification of a user base or client, needs assessment, and then iterative design and testing of the artifact. These projects often also have a backend design component using database design principles, document engineering modeling, or information architecture and organization principles, with sensitivity to legal considerations for privacy and intellectual property.

Students are required to present their work to an audience of students, faculty, and professionals; produce a written report; and produce a website that describes and, where relevant, demonstrates their work. Presentation skills are considered a critical part of SIMS' professional education.

HCI COURSES

As mentioned above, HCI at SIMS is not an explicit program, but rather an emphasis or focus area. Thus there are no required courses in the HCI area. There are two courses, however, that can be considered the core of the HCI emphasis and most students take both of these. These are 214: Needs and Usability Assessment, and 213: User Interface Design and Development.

Additional relevant courses focus around New Media, in particular, 246: Multimedia Information, which also includes mobile and ubiquitous computing, and a special topics course call Media Design Studio. We also regularly teach 247: Information Visualization and Presentation. We also offer courses in quantitative and qualitative methods, although these are taught in a manner that can be used by

students throughout the program, not just those emphasizing HCI.

We also offer a number of special topics courses that change each semester. A course on graphic design would be a useful addition, as would a course on user interface programming, although we do offer special topics courses on web and service programming.

In the past we have had a close working relationship with the HCI faculty and students in the Computer Science Division at UC Berkeley. HCI (and other) students from Computer Science take our HCI courses, and our students take graduate HCI offerings when available. There are also a few courses taught in other departments (mechanical engineering, architecture) which a few of our students enroll in.

Detailed Description of the User Interface Course

The User Interface Design and Development course teaches the user center design methodology, and provides a project organization framework that is often used for SIMS final projects, regardless of whether or not the students are concurrently enrolled in the course. The process has in fact become part of the structure of the school, being learned "by osmosis" and used even by students who have not taken the course. It is time-intensive, so much so that students earn 4 units of credit even though class time is only 3 hours per week.

The course is closely modeled on the undergraduate course previously developed by James Landay (while he was at UC Berkeley) and its goal is to enable students to exit the course with a working knowledge of how to do user-centered design. It has often proved sufficient to allow students to be hired into interaction design jobs (in combination with their other experiences and other course work). The course strongly advocates the importance of centering design around the needs of users and how they do their tasks, of holding the designers accountable for difficult-to-use systems, rather than blaming the user, and of doing many rounds of fast prototyping paired with evaluation. The course also requires a wide range of readings and includes a midterm along with at least one individual assignment (the latter two are important for enabing athe professor to write informed letters of recommendation for individual students).

First, students identify a user need and write a project proposal, based on suggestions from the instructor or other contacts with clients who need something designed (often these clients come from campus jobs, the e-Berkeley initiative, or students former or current employers). The proposal is evaluated by the professor and the TAs and students are asked to refine it. Then the needs assessment in the form of interviews, surveys and/or observation takes place. This is followed by a task analysis, scenario design, and persona development, and initial sketches of interaction flow. Next is low-fidelity prototyping and testing with 3 target users. After this the interface is redesigned and an initial impoverished interactive prototype is developed. This is evaluated via heuristic evaluation, in which team members from one project evaluate another project. After this, a second interactive prototype is developed and then an informal usability evaluation is conducted, again with at least 3 target users. Finally, the interface is revised once more and the students present the final products in a class presentation.

Class time is sometimes used for project work. One class is used for the exchange of heuristic evaluations. Another is used for suggestions for solutions to tricky design problems. Two others are used for mid-project presentations, to aid the teams in the heuristic evaluations.

Detailed Description of the Needs and Usability Assessment Course

Fundamental to user-centered design, and to SIMS' overall orientation of combining technology with an understanding of users, is knowing how to assess needs of users as both a prelude to design and a basis for evaluation. Whereas IS213 emphasizes design based on these considerations, IS214 teaches methods of collecting, interpreting, representing, communicating, and using this information. Like IS213 and other courses in the SIMS curriculum, students learn these methods in the context of a group project for an actual client.

The course addresses both the concepts and methods of usability, with an emphasis on an inclusive definition of usability and usefulness as embracing the entire sociotechnical system, not just the technology or the interface. The course begins with an introduction to user-centered design, and quickly moves into methods of collecting and interpreting information about user needs and incorporating them in the design process. It then treats methods for evaluating systems at various stages of development. Methods are both quantitative and qualitative, and include ethnographic methods, usability testing, developing and using heuristics, surveying, and interviewing, and others. The course also addresses issues of universal usability. Guest speakers from industry complement the readings and lectures.

The emphasis here as elsewhere in SIMS is on project-based learning. Hands-on exercises accompany each major method. Students' major product is a project (usually in a group, usually for a real client) that consists of some combination of user needs assessment and evaluation appropriate to the case.

DATA

Our program graduates about 40 masters students per year. Approximately one third of the masters students end up focusing on HCI and getting jobs in industry, nonprofits, or working on campus doing interaction design, ethnographic work, interface assessment, and related work. Sample employers include eBay, Google, Yahoo!, Library of Congress, Oracle, and Samsung, as well as many campus job (soft and permanent staff positions).

About one third of these students were already immersed in jobs or experience having to do with HCI and came to the masters program either to get a more formal education in the matter, or to round out their HCI knowledge with other subject matter. Some of these students want to beef up their technical skills, others want to learn about other aspects of information technology that we offer, such as information design and organization, legal and policy issues, or social dimensions of IT. Still others want to gain a business background, and do so by taking courses from the Haas School of Business, in order to earn a Management of Technology certificate.

About two thirds of the students who end up focusing on HCI were not particularly familiar with it before they entered the program. There is always a set of students who first encounter HCI in the core user interface design course, and find their true career calling in the field.

Because the program is small, the faculty and staff know most of the students well, and hear in detail about what many of them are doing after they graduate. Our graduates often become advocates for the principles of user-centered design in their workplace. I have heard many tales of former students regaling their employers with the benefits, and battling to change corporate practice. Often these students are successful.

CATALOG-STYLE COURSE DESCRIPTIONS

A number of courses not listed below can be considered important for information-centric HCI. These include Information Organization and Retrieval, Applied Natural Language Processing, Information in Society, and others.

213: User Interface Design and Development (4)

Three hours of lecture per week. Prerequisites: 204 or consent of instructor. User interface design and human-computer interaction. Examination of alternative design. Tools and methods for design and development. Human computer interaction. Methods for measuring and evaluating interface quality.

214: Needs and Usability Assessment

Concepts and methods of needs and usability assessment. Understanding users' needs and practices and translating them into design decisions. Topics include methods of identifying and describing user needs and requirements; user-centered design; user and task analysis; contextual design; heuristic evaluation; surveys, interviews, and focus groups; usability testing; naturalistic/ethnographic methods; managing usability in organizations; universal usability.

217: Quantitative Research Methods for Information Management

Three hours of lecture per week. Quantitative methods for data collection and analysis. Research design. Conceptualization, operationalization, measurement. Modes of data collection, including experiments, survey research, observation. Sampling. Basics of data analysis.

272: Qualitative Research Methods for Information Management

Three hours of lecture per week. Theory and practice of naturalistic inquiry. Grounded theory. Ethnographic methods including interviews, focus groups, naturalistic observation. Case studies. Analysis of qualitative data. Issues of validity and generalizability in qualitative research.

246: Multimedia Information

Three hours of lecture per week. Concepts and methods of design, management, creation, and evaluation of multimedia information systems. Theory and practice of digital media production, reception, organization, retrieval, and reuse. Review of applicable digital technology with special emphasis on digital video. Course will involve group projects in the design and development of digital media applications.

247: Information Visualization and Presentation

Three hours of lecture per week. The design and presentation of digital information. Use of graphics, animation, sound, visualization software, and hypermedia in presenting information to the user. Methods of presenting complex information to enhance comprehension and analysis. Incorporation of visualization techniques into human-computer interfaces.

290: Digital Media Design Studio

an advanced graduate level studio course in which students develop and present a digital media application prototype. Projects involve the creation, use, and reuse of digital media and metadata.

THE HCC LIBRARY

Materials from two of our HCI courses have already been used to seed the HCC library. We have not discussed as a department what our policy will be generally with respect to the library.