

## COMPUTER HUMANITIES

William Bricken

November, 1999

High-technology is interacting with every aspect of our lives. The digital revolution is currently challenging the foundations of our cultural institutions and our ways of knowing.

Imagine, for example, having the world's library at the fingertips of each and every scholar, as well as both the current work of the community of scholars and the interactive commentary of any individual on the planet who wished to follow the discourse. Such a technical empowerment clearly places the burden of scholarship entirely on the ingenuity of the scholar to navigate between useful and irrelevant information, known and unknown territories, encoded and experiential communication.

A powerful tool multiplies the capabilities of an experienced technician; it also limits the vision of the technician to the capabilities of that tool. Computer Humanities addresses this *interface between person and tool*, seeking technical, ethical, humanistic, and empowering approaches to the personal and societal impact of our interaction with computers.

Imagine automated processes so complex, so globally integrated, so unfathomably fast that no human mind could follow. Imagine learning the skills of effective interaction within this digital domain. Such a domain has recently been discovered by the business community: a new media and substrate which encourages instantaneous transactions unlimited by distance, by physical presence, or by local availability, a technological coupling of telecommunications, computing, entertainment, education, and marketing.

A vigorous program in software engineering would require economic and resource support both for student participation and for staff development. Business partners will provide strong support to programs which address known business needs that are projected to grow over the next several years. For a software program to remain resilient, it must provide *training for the future*.

Imagine learning computer science in an integrated environment of computer-based instruction, with lessons, examples, and tools available at any time, in cyberspace. Such an enabling curriculum provides pedagogical consistency, stimulating learning opportunities, and relevance of context and activity.

Computer-based instruction refocuses the effort of teaching from redundant classroom recitation to continuous development of new content and to frequent, personal interactivity with each student. The teacher becomes much more of a learning colleague and much less of a presentation automaton. The mission of a Computer Humanities program should be both *stimulating teaching and relevant content* fully integrated within a computational delivery medium.

The above imagined scenarios are of course our current reality. The key facilitating technology for full utilization of the capabilities of our nation's information infrastructure is human-computer interaction. Commercial questions of empowering software, of universal access, of visual understanding, of multimodal experiences, of easy-to-use information systems all rest on reducing the complexity of our interaction with our computational resources. Human-Computer Interaction is a fundamental subject for Software Engineering and is recognized by the National Science Foundation as a core component of the Computer Science curriculum. For almost all software products, the majority of programming time and effort goes to the product interface. The interface between people and digital technologies is the primary bottleneck to information accessibility. Interface development skills are the most rapidly growing need in the commercial software sector.

Developing and understanding humane ways to interact with computers serves the mission of the University, the goals of the graduate program, and the needs of the professional software industry. Examination of our humanity in relation to the inexorable growth of digital technology provides a context for substantive contribution to the commonweal of our community, an opportunity to develop exemplary programs which provide tools for dignified interaction within the information culture of the 21st century.

A course description for Computer Humanities might look like the following:

### **SE999            COMPUTER   HUMANITIES**

Our interaction with computers and with computing is evolving. We have moved from an emphasis on humans learning the symbol systems of the computer (command lines and programming languages) to an emphasis on the computational generation of environments familiar and comfortable to humans (multimedia and virtual environments).

Computer Humanities addresses the forth-coming humanization of the computer interface. The multimedia/virtual reality paradigm shift is a renegotiation of the boundary between human friendliness and computer formalism. This shift introduces new theories of representation and of meaning. New software interaction techniques focus on the entire body as interface, involving the whole person in a digital interaction. New programming techniques are used to construct computational entities and personal agents. Deeply involving the computer participant in a digital environment requires ecological and introspective software tools. The technical content of this course will cover multimedia computer architecture, interactive programming methodology, distributive agent modeling, computer graphics, hypertext, virtual reality, human physiology, cognitive psychology, and collaboration theory.