

## How the Dept. of Computer Science advances the mission of Augsburg College

- **We are based in the Liberal Arts:**

Our field itself is truly interdisciplinary, sitting on a foundation of mathematics, supporting work in psychological perception, human-computer interfaces, graphic design, engineering and language understanding. As Peter Freeman, Assistant Director of the National Science Foundation (NSF) for Computer Information Science and Engineering (CISE) wrote: “Computer science, the disciplines based on it, and the students and results that flow from your efforts are at the heart of everything from economic development to national defense to better human communication.” [Freeman 2005]

Computer science is a laboratory science. Augsburg CS majors have an opportunity to do research in areas ranging from space physics to robotics to virtual reality. In addition to the research, we offer courses such as CSC431 (Robotics), CSC457 (Computer Graphics) and CSC373 (Artificial Intelligence) which directly address these interdisciplinary topics.

Steven Lohr writes: “In 1999, a report by the National Research Council, an arm of the National Academy of Sciences, titled ‘Being Fluent with Information Technology’ called for a broader definition of computer education that would emphasize not just practical skills but also concepts, principles and ideas.” [Lohr 2002] We see that definition as incorporating the very essence of a Liberal Arts education.

- **We are shaped by a sense of vocation:**

The nature of our science is exploratory. We must accept the proposition that “we could be wrong” because we know that there is still a great deal to learn. To again quote Freeman: “the future will see developments that even we cannot imagine.”

Computers are morally neutral. They cannot determine if the use of information is ethical. We introduce the topic of computer ethics in the very first course in the major. Computers hold the private details of lives. Our students become ethical, responsible guardians of that private information. Freeman continues: “Yet, with that comes great responsibility to utilize our resources strategically for the benefit of all, not only technologically, but also in helping to guide the productive use of the wonders that come from our efforts.”

We as a department are very careful to consider the ethical and moral values held by those of our students who are not Christian to be as worthwhile as “the values of the Christian church.” All of our students, along with their beliefs, are treated with respect. With that in mind, we have forged a Keystone course emphasizing vocation and service which demonstrates this egalitarianism.

- **We are shaped by our metropolitan setting:**

The department has actively sought out opportunities to be a good neighbor to the citizens of our city. As an example, we have created a partnership with Learning in Style, an educational center for new immigrants in South Minneapolis. Some of our majors have satisfied their Augsburg Experience requirement by volunteering at this center. They have tutored students in mathematics and computer skills, networked and maintained the workstations, installed software, written new educational programs and worked on successfully funded grant proposals. We also sponsor a program which sets up and maintains computers for an after school center for immigrant children which is located near the Augsburg campus.

Our students work on joint research projects with fellow students at other Twin Cities colleges and universities. We exploit the richness of the Twin City computer science community by bringing

guest speakers onto our campus on a regular basis. Our graduates are partners in education. We consider them to be valuable resources. (See [www.augsburg.edu/compsci/Recruit](http://www.augsburg.edu/compsci/Recruit))

The Twin Cities remains a hotbed of high tech development. This infrastructure provides opportunities for internships and future employment. A few examples of these companies are Medtronic and Boston Scientific (cardiac pacemakers), Starkey, Maico and Telex (hearing aids), Unisys, Lockheed Martin and Honeywell (defense systems), Seagate (disk storage systems), ADC (telecommunication systems), WestLaw (legal databases) and Adobe (software).

- **We are shaped by an intentionally diverse campus community:**

Many of our majors are first generation college students, many are immigrants or the children of immigrants. Some have found a home in computer science in spite of their poor language skills. Computer languages are easier for them than English. This definitely shapes our departmental community. Half of last year's programming team was made up of students for whom English was not their first language.

In our classes, we are currently addressing the differences in learning styles of women and minorities through NSF sponsored joint work with the University of Minnesota and Berea College in Kentucky. We hope, as the demographics of our country evolve, that the results of this work will become a guide for colleges across the country who also have a goal of affirming individual differences.

We have majors who, due to physical disabilities, require a computer to participate in their courses. We embrace the many advances that computer science has made in helping the disabled, including robotic aids and voice recognition systems. Our AIBO dog robots demonstrate some of the future contributions that our field and our students will make in this area.

[Freeman 2005] Freeman, Peter, in *Computing Research News*, September 2005.

[Lohr 2002] Lohr, Steven, in *New York Times*, 31 October 2002.