

## COMPUTER SCIENCE

### MAJOR

Mathematics, Statistics and Computer Science

### Contract Major

Computer Science

[www.stolaf.edu/depts/cs](http://www.stolaf.edu/depts/cs)

# So Much More Than Cranking Out Code



**T**hey may not have the level of control imagined in *The Matrix*, but computers have come to play significant roles in our 21st-century lives. The St. Olaf computer science program helps students leverage fundamental computing concepts to solve problems while gaining a greater understanding of the complex relationships between humans and their technological tools.

A St. Olaf computer science major does more than learn to program. A programming language might be obsolete soon after the student enters the workforce. Instead, students focus on theory, abstract thinking and system design — foundations that remain relevant over generations of technological change.

“The same principles that govern your desktop or mainframe computer also run the chips embedded in your car,” says Associate Professor Richard Brown, director of the St. Olaf computer science program. “By getting a good grounding in the principles first, you have the savvy to go in all kinds of directions. You can get a lot from a particular technology, but it takes insight to see connections between the mainframe and the car computer. We teach the insight.”

“So when you get to a job,” says senior computer science and music major Mike Smith, “you can learn anything they throw at you.”

Contrary to stereotypical perceptions, St. Olaf computer science majors don't hole up in their rooms staring at screens all day. This program demands that students collaborate with one another and with faculty on interdisciplinary teams — conducting research and developing applications that serve practical functions for other campus programs.

“If we are going to do computer science, we might as well do it in a way that enriches the academy and, ultimately, society as a whole,” says Brown. “When an application helps someone, the exercise gets additional meaning, and students value that meaning.”

“In high school, you are given assignments and

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you do them,” observes senior computer science and art double major Chris Mueller. At St. Olaf, he says, “you are one of the people coming up with ideas. We learn how to solve problems that haven't been solved before.” ■

## ETHICS, ETHICS EVERYWHERE

**E**xploration of technology's ethical implications and social ramifications permeate the St. Olaf computer science curriculum, an emphasis found in few other academic programs. Among the courses that include ethics-related subjects:

- ▶ **Principles of Computer Science:** This entry-level class introduces students to the concept of “computing ethics,” with discussions of that field as it pertains to current events.
- ▶ **Ethical Issues in Software Design:** Taught by Professor of Psychology Chuck Huff, who is internationally recognized as a leader in the field of computing ethics, the course places computing methods and tools in historical and social context and examines the foundations of human-computer interaction.

## WRAPPING IT UP: THE SENIOR CAPSTONE SEMINAR

**T**he elements of a St. Olaf computer science education come together in this course, taken by senior majors in the fall term. Student teams spend the semester looking at a software project from several angles. They read and report on research literature relevant to their work; they maintain or improve functionality of the application under study; they conduct an ethical and social impact analysis of the software; they write and present papers describing their accomplishments; and they document their work so that, in the future, others may pick up where these graduates leave off.



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## WORKING WORLD

**S**t. Olaf's computer science program is a solid jumping-off point for students who wish to pursue further study in graduate school or seek careers in information technology, software design or computer engineering. The curriculum's emphasis on conceptual understanding, project management, analytical skills, research and interdisciplinary work ensures that graduates leave prepared for other professional fields as well.

“Like the best of all liberal arts majors,” says Assistant Professor of Computer Science Olaf Hall-Holt, “computer science prepares the mind, prepares the heart and gets you ready for many different things that may have nothing to do with computers at all. Questions like, ‘What does it mean to be human?’ can be thought about from a computer science perspective, and these perspectives are becoming increasingly relevant as more people use computational devices in everyday life.”

Paid internships give students an early taste of vocational life. Computer science and mathematics major Aaron Etshokin '05 spent the summer after his junior year working for Securian Financial Group. He applied for the position after attending a recruiting talk by the firm arranged by St. Olaf's Center for Experiential Learning. The internship gave Etshokin valuable experience — and an income.

“It paid very well,” Etshokin says. “It was basically equivalent to a full-time job.” By the fall of his senior year, Etshokin was assured permanent employment as a Securian programmer/analyst after graduation.



## MEETING NATIONAL STANDARDS

St. Olaf is one of few liberal arts colleges to offer a computer science major that spans the national standards established by two major professional societies: the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers (IEEE) Computer Society.

*“Computer science is not just about a machine. Computer science is about thinking, communicating, solving puzzles and building systems. It has an appropriate place in a liberal arts education.”*

— Olaf Hall-Holt  
Assistant Professor of  
Computer Science

## COOL ROOM

### The Graphics Lab: Multidimensional Multimedia

**C**omputer science students and faculty recently unveiled a teaching tool that adds a new dimension to the educational experience. Software, a 16-foot by 8-foot screen, and a pair of digital projectors work together to give standard, two-dimensional images a 3-D appearance. Two still photographs (or video streams) of a single scene, captured from slightly different positions, are imported into applications developed by St. Olaf students and then projected, one over the other, onscreen. Polarized filters on the projectors and on eyeglasses worn by

viewers keep each individual image visible to only the left or right eye. By looking through both eyes, viewers see the complete three-dimensional picture.

“Anyone can take two parallel pictures with a digital camera and bring them to us, and we can project a 3-D image,” says senior computer science and mathematics major Aaron Etshokin, who contributed to the development and implementation of this innovative facility. “I think that's awesome.”

