

Computer Science

“The Mobile App Development course laid the groundwork for my interest in mobile apps and prompted me to begin my own independent development project, which provided the skills I needed for my internship at John Deere ... I was not only able to deliver, but I managed to land a job nine months ahead of graduation. Cornell was unequivocally foundational to that success.”

Kent Schlorff '16

The computer science program at Cornell prepares students for employment and advanced study. Because computer science has applications in diverse fields, students find many doors open to them. Computer science courses also foster rigorous analytical skills, provide a range of problem-solving challenges, and expose students to technical tools that benefit them no matter what their major or career field.

Cornell's small classes allow professors to provide individual support to students and to tailor course topics and projects to student interests. Department faculty are focused on teaching undergraduates and continually adopt new teaching methods and technologies, following best practices from the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE.)

At all course levels, the objective is to develop skills in teamwork, communication, and other important areas that go beyond writing code. Students read in professional literature. Our classes give students practice presenting their work to their peers. Students learn to communicate through the written and spoken word. Cooperative work, including group projects, plays a significant role in the curriculum.

The department offers many additional opportunities for students to engage in computer science outside the classroom, including International Collegiate Programming competitions, travel to professional meetings, visits to local businesses, and connections with alumni.

Opportunities to pursue individual projects, internships, and extended research enable students to build impressive resumes. Members of the faculty come to know their students well. They are able to write detailed, persuasive letters of recommendation for them.

BENEFITS OF ONE COURSE AT A TIME

Computer science faculty take full advantage of Cornell's One Course At A Time schedule in designing course strategies. A typical computer science course includes a lecture and discussion component, a closed lab component, and an open lab component.

Closed labs are similar in structure to physics or chemistry labs. The instructor sets up the exercise, provides tutorial assistance, and circulates among students to troubleshoot problems as they arise. Open labs invite more creative exploration, and students work according to their own schedules. All courses enjoy dedicated classroom space, and students are free to work on projects beyond normal class meeting times.

Beyond the classroom, many students take advantage of the block plan's flexibility to complete internships or individual projects.

CURRICULUM HIGHLIGHTS

For majors, the department has broad offerings, with a general focus on software design. Professors introduce students to programming using the Java and Python languages. Students in upper-level courses also solve problems using JavaScript, Ruby, Scala, and other programming languages.

Computer science majors complete at least four 300-level courses, which include a range of advanced topics options that vary from year to year.

Faculty Bios & Courses

TONY DELAUBENFELS *Professor of Computer Science and Mathematics*

His teaching and research interests in computer science include mobile app development, computer networks, client-server systems, databases, parallel programming, and numerical analysis. He has been a leader in bringing computing technology into teaching and learning at Cornell. M.S. in computer science and M.S. in mathematics, University of Iowa

ROSS SOWELL *Assistant Professor of Computer Science*

Teaches a variety of courses that span the computer science curriculum, including topics courses such as Human-Robot Interaction and Dealing with Data. His fields of research are robotics and computer graphics. In the classroom he enjoys applying and developing his pedagogical research interests in the use of active and collaborative learning techniques for computer science education. Ph.D. in computer science, Washington University-St. Louis

LEON TABAK *Professor of Computer Science*

Special interests in new educational media and computer graphics. He is active in the Institute of Electrical and Electronics Engineers professional society, taking students to visit local companies, universities, laboratories, and to conferences. He also supports the College Board's Advanced Placement Program by leading workshops and teaching short courses for high school teachers of computer science. Ph.D. in computer science, Worcester Polytechnic Institute

These topics courses allow students and faculty to explore aspects of computer science in which they have a special interest. Recent topics course titles include: Mobile App Development, Human-Robot Interaction, Open Source Projects, and Dealing with Data: Data Management, Data Visualization, and Big Data (co-taught with Ann Cannon, Professor of Statistics.)

CAPSTONE PROJECT

In the computer science capstone course, Professional Practice, students improve a project begun and substantially completed in another course. Recent projects include a device for measuring the movement of ocean waves, an app to help friends track and share the costs of dining out, and an app for controlling the flight of a drone.

During their capstone project students gain experience in all phases of iterative software development, and they also benefit from presenting their work to their peers and reviewing other students' work. The overall experience reflects the types of challenges typically faced in industry and prepares students for the opportunities that await them after graduation.

STUDENT/FACULTY RESEARCH

ROBOTS AND PRIVACY

In his research with students during summers and the school year, Professor Ross Sowell explores the implications of allowing a remote operator to control a robot or similar device in a private space, such as a home or office. The goal is to create a set of programmatic building blocks that meet the privacy expectations people have for their interactions with remotely operated devices.

OFF-CAMPUS SUMMER RESEARCH

Recent research projects completed beyond campus include:

- Linux kernel vulnerabilities, Carnegie Mellon University
- Biochemistry statistics, George Mason University
- Human-robotic interaction, Oregon State University
- Data quality sensing on Android devices, University of California, Irvine
- Agent-based modeling, University of Tokyo
- Bioengineering, University of California, Berkeley

- Data visualization, Space Telescope Science Institute, Baltimore, Maryland
- Computer security, Dartmouth College

INTERNSHIPS/FELLOWSHIPS

Many students complete summer internships, and Cornell's One Course curriculum also provides the flexibility to complete internships for a block or more during the academic year. Recent internships include:

- Information technology intern, John Deere, Davenport, Iowa
- Software development intern, TAC 10, Cedar Rapids, Iowa
- SQL/Application developer intern, BBK Electronics, Nanjing, China
- IM power delivery intern, Florida Power & Light, Jupiter, Florida
- System integration testing intern, Trapeze Group, Cedar Rapids, Iowa
- Drupal and Python intern, OneRain, Longmont, Colorado
- Software engineering intern, Facebook, Menlo Park, California

AFTER CORNELL

The National Association of Colleges and Employers (NACE) reports that demand for computer professionals is projected to grow 12 percent faster than the average for all occupations through 2024, with an average starting salary of \$71,534 for 2016 grads. Computer science graduates may choose from numerous career paths, including working as a software applications developer, systems analyst, network or database administrator, business intelligence analyst, or quality assurance (QA) specialist.

ALUMNI CAREERS

Software engineer, Kubica Corporation, Novi, Michigan (Class of 2017)

Software Development Engineer, Amazon, Seattle, Washington (Class of 2017)

Software Engineer, Kranze Technology Solutions, Prospect Heights, Illinois (Class of 2017)

IT Early Development Program, John Deere, Des Moines, Iowa (Class of 2016)

Software Developer, The University of Iowa Health Care, Iowa City, Iowa (Class of 2015)

Digital transformations consultant, Sogeti, West Des Moines, Iowa (Class of 2015)

Web developer, AppealingStudio, Frisco, Texas (Class of 2015)

Associate software engineer, ConnectWise, Tampa, Florida (Class of 2015)

Programmer, Data Managers Inc., Vernon Hills, Illinois (Class of 2014)

Associate software engineer, Connecture, Durham, North Carolina (Class of 2014)

Visiting researcher, Carnegie Mellon University, Pittsburgh, Pennsylvania (Class of 2014)

Web development track, Startup Institute, Boston, Massachusetts (Class of 2013)

Software support specialist, OpticsPlanet, Waukegan, Illinois (Class of 2013)

IT consultant, Prescio Consulting, Casa Grande, Arizona (Class of 2013)

Software developer, Epocrates, Berkeley, California (Class of 2013)

Software engineer, Cazena, Cambridge, Massachusetts (Class of 2013)

IT business analyst, AIG, Boston, Massachusetts (Class of 2013)

GRADUATE SCHOOLS ATTENDED

M.S., human-computer Interaction, University of Michigan College of Engineering, Ann Arbor, Michigan (Class of 2016)

Ph.D., human-computer interaction, Washington University, St. Louis, Missouri (Class of 2015)

Master of applied computer science, multimedia, Dalhousie University, Bible Hill, Nova Scotia (Class of 2014)

M.S., electrical and computer engineering, Southern Illinois University, Carbondale, Illinois (Class of 2013)

Master of engineering, computer science, University of California, Berkeley, California (Class of 2013)

M.S., information technology, Bentley University, Waltham, Massachusetts (Class of 2013)

M.S., computational mathematics, Stanford University, Stanford, California (Class of 2012)

Ph.D., computer science, University of Colorado Boulder, Boulder, Colorado (Class of 2012)