

Computer Science

CORNELL ENGINEERING

Primary Area of Education and Degree Programs Offered

Computer Science is one of Cornell's top-ranked departments. We offer two undergraduate computer science degrees: BS (Engineering) and BA (Arts and Sciences), a Master of Engineering and a PhD program. We also helped develop and run Cornell's new Information Science Program that offers a PhD program, and undergraduate programs ISST (Engineering) and IS (A&S and CALS).

Department's Primary Areas of Research

Areas include algorithms and theory, systems, networking and databases, programming languages, and artificial intelligence and machine learning, scientific computing, vision, graphics and computational biology. We also have a number of cross-cutting themes, including: Social Networks - the science underlying modern social networks including the Web and Wikipedia; Security and Trustworthiness construed to include reliability, security, and program correctness; Data Mining and Information Discovery; and Robotics.

Significant Trends in the Past 5-10 Years

The Information Revolution is transforming society, creating new careers, new industries, and new academic disciplines. This transformation requires computational ways of thinking to deal with global communications networks, and interactive information resources. One consequence is the broadening of the field of computing.

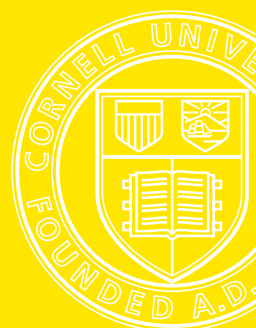
CS has been experiencing turmoil in enrollment. During the .com boom enrollments in all CS departments reached an all time high. Cornell's CS major graduated over 190 students in 2001. After the bust, enrollment declined, but is increasing now. The increase is slow in large part due to unsubstantiated fear of outsourcing.

Department and Faculty Achievements

Created new interdisciplinary Information Science major and PhD programs; Created Game Design Initiative and ugrad minor; Created four new engaging introductory courses; Received many faculty awards including: MacArthur "Genius" award, Microsoft New Faculty Fellow, SIGOPS Hall of Fame award, Academy of Motion Picture Arts and Sciences Technical Award, and 2 additional faculty elected to National Academy of Engineering; Per capita expenditures per computer science faculty approximately \$600K, well above the median computer science departments ranked 1-12; New \$2M/year NSF Expedition award for Computational Sustainability.



DARPA urban challenge: Cornell was one of only six teams to finish the final race (out of 35 at the qualifiers and 11 that started the final race). It was a student-led team primarily composed of undergraduates. Faculty advisors are Mark Campbell (MAE) and Dan Huttenlocher (CS).



Priority Goals

Maintain and enhance leadership position both in computer science and in information science; Enhance educational programs: continue to attract and educate outstanding undergraduate, MEng and PhD students; Building: New Gates Building to bring IS and CS closer, and integrate students and research.

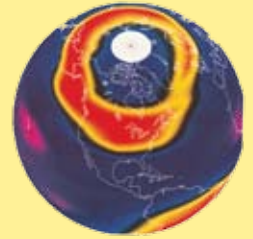
Challenges

No field has ever seen the degree of disruptive change that seems to be the norm in CS. Anticipating and planning for game-changing revolutions is a tremendous challenge for the field. We plan to address this challenge by hiring and retaining great faculty who have the flexibility to define new areas.

We also need to cope with dramatic shifts in the interests and motivations of our student population: they are drawn to CS as a “problem solving” domain, but frightened by the idea of a life spent writing code. This shift has especially affected women and minorities, and we will need to work to increase the interest of women and minorities in our field.

Opportunities

The Information Revolution is affecting all aspects of society, and is broadening of our field. This presents challenges for our relatively small department. We need to increase faculty size closer to that of our peer departments.



New \$10M NSF Expedition award for the Computational Sustainability project. Vision: Computer scientists can – and should – play a key role in increasing the efficiency and effectiveness of the way we manage and allocate our natural resources, while enriching and transforming Computer Science.



Project presentation in Ramin Zabih’s Honors-level introduction to computer science using camera-controlled robots.