



Computer Science

ENGINEERING

CORNELL ENGINEERING

Degree Programs and Research Areas

Computer Science Department

Undergraduate Degrees

- Bachelor of Science (Engineering)
- Bachelor of Arts (Arts & Sciences)

Graduate Degrees

- Master of Engineering
- Ph.D.

Information Science Program

Undergraduate Degrees

- ISST (Engineering)
- IS (Arts & Sciences and CALS)

Graduate Degrees

- Ph.D.

Primary areas of research:

- algorithms and theory
- systems, networking and databases
- programming languages
- artificial intelligence and machine learning

Other areas include: vision and graphics, scientific computing, and computational biology

Many cross-cutting themes. Examples include:

- 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
- Robotics focusing on autonomous vehicles

Trends

The Information Revolution is transforming society creating new careers, new industries, and new academic disciplines.

- Requires computational ways of thinking to deal with global communications networks, and interactive information resources.
- Broadening of the field of computing.

Enrollment turmoil:

- During the .com boom enrollments in all CS department all time high, followed by major drop, and is now increasing. The increase is slow in large part due to unsubstantiated fear of outsourcing.
- Similar decline in percentage women and minorities.

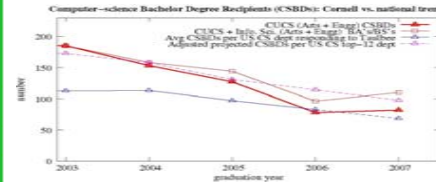
Achievements

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



- Created four new engaging introductory courses.
- Created new interdisciplinary Information Science undergraduate major, minor and PhD programs.
- Created Game Design Initiative and minor.
- Received many faculty awards including: John D. and Catherine T. MacArthur Foundation "Genius" award, a Microsoft Research New Faculty Fellowship, Special Interest Group on Operating Systems (SIGOPS) Hall of Fame award, an Academy of Motion Picture Arts and Sciences Technical Achievement Award, and two additional faculty members were elected to the National Academy of Engineering.
- Per Capita Expenditures per computer science faculty is approximately \$600K, well above the median computer science departments ranked 1-12 (Taulbee Survey).
- New \$2M/year NSF Expedition award for the Computational Sustainability project.

Priority Goals



Enrollment data for Cornell's Computer Science and Information Science programs, and enrollment in top 12 computer science departments from Taulbee survey. Dotted lines: Taulbee projections from 2007. Adjustment for US top - 12 depts. Assumes same projected -> actual adjustment rates as for national data

- Maintain and enhance leadership positions both in computer science and information science.
- Enhance educational programs: continue to attract and educate outstanding undergraduate, Masters and Ph.D. students.
- Building: New Gates Building to bring Information Science and Computer Science closer, and integrate students and research.
- Increase faculty size closer to our peers, to allow us to expand to areas now closely tied to computing and information.



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).

Challenges

Regular large disruptive change in the field caused by changes in technology.

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.



Annual Bits On Our Mind (BOOM) showcase 2008. At the Duffield Hall Atrium featured projects from many areas of engineering to art, biology, music and humanities. Cornell students show off their digital technology research projects focusing on forward-thinking, cutting-edge innovations.

Opportunities

The Information Revolution is affecting all aspects of society, and results in broadening of our field.

This change creates unique opportunities and demands that affect society.

Opportunities for interdisciplinary work with fields ranging from all areas of engineering, through the social sciences, and including arts and humanities.

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.

