



Prestigious Alumni

Many of our graduate alumni have gone on to outstanding careers in academia and industry. Below are just some of our most prominent alumni.

- Rick Rashid '80 (PhD) (Emeritus) is the founder of Microsoft Research
- Danny Sabbah '82 (PhD) (retired) was general manager and CTO of IBM Cloud
- Corinna Cortes '94 (PhD) is head of Google's New York City lab
- Ricardo Bianchini '95 (PhD) is chief efficiency strategist at Microsoft Research
- Robert Wisniewski '96 (PhD) is chief architect for High Performance Computing at Intel
- Andrew McCallum '96 (PhD) is a professor of computer science at the University of Massachusetts, Amherst
- Mayur Thakur '04 (PhD) is chief data officer of H1
- Piotr Faliszewski '09 (PhD) is a professor of computer science at AGH University of Science and Technology



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Computer Science Doctoral Program

AT THE UNIVERSITY
OF ROCHESTER



Graduate and undergraduate students experiment with multi-modal interfaces for human-computer interaction.

AI/HCI
Systems
Theory
Cross-Disciplinary Research



Our PhD program was established in 1974 and has a history of more than 40 years of world-class research, especially in artificial intelligence/human-computer interaction, software systems, and the theory of computation. We provide a collegial, interactive environment in which faculty directly mentor students. All faculty and PhD students, regardless of their area, are familiar with each other's work. This is possible only in a relatively small, close-knit department.

Our philosophy is that computer science research is a shared endeavor, crucially dependent on the vitality of the local community in which it takes place. We believe that graduate students are the heart of our research productivity, and we make them first-class department citizens. Graduate students serve on all department committees and, in particular, are crucial members of faculty and graduate student recruitment efforts.

Doctoral Study Areas

AI/HCI

Have you ever wanted to make computers as smart as human beings? Are you interested in making robots that better serve people? Have you found current computing systems too difficult to use? Have you ever wanted to discover the valuable information hidden within big data? If so, then you should explore our Artificial Intelligence and Human-Computer Interaction group. They have led the way in creating interactive and intelligent technologies that help people better learn, live, interact, and collaborate with each other. The AI/HCI group specializes in several key areas:

- Affective computing
- Augmented and virtual reality
- Computer vision
- Health informatics
- Knowledge representation
- Learning and assistive technology
- Machine learning and data mining
- Natural language processing and understanding
- Robotics
- Social computing

Theory

At its heart, computer science is about algorithms: using them to solve important problems, understanding the barriers to such solutions, and finding ways to bypass those barriers. Our Theory group thus not only does foundational algorithms and complexity work but also brings that work and a theoretical perspective to problems from a wide range of exciting domains. Those who share a desire to explore the field are warmly invited to join us. Examples of the questions we study are: How do you design a voting system that makes manipulation computationally prohibitive? From what distributions can we sample effectively? What is the relationship between computer science and democracy? How can the study of approximate algebraic structure improve the quality of algorithms? The Theory group has several areas of particular focus:

- Algorithms
- Combinatorics
- Computational complexity
- Computational social choice/economics and computation
- Pseudorandomness
- Sampling, counting, and Markov chains

Systems

Interested in understanding what makes computing systems work? Ever wondered how to build software that scales up to serve people from all over the world? Want to build programming tools to make coding easier and more efficient? Do you want to solve the security challenges that have plagued computing? If so, our Systems group is for you. The Systems group performs cutting-edge research in many critical areas:

- Compilers, program analysis, and program transformation
- Computer security
- Data and knowledge management
- Operating systems
- Parallel and distributed computing
- Processor and memory architecture

Our PhD students develop new ways to improve the performance and functionality of mobile, cloud, and multicore systems; devise novel and power-efficient processors and memory; understand the behavior of complex modern applications; and create new countermeasures to defeat sophisticated cyber attacks. We disseminate our results to both academia and industry and contribute to major open-source projects.

Cross-Disciplinary Research

The Department of Computer Science engages in cross-disciplinary research, working closely with other departments to apply computing to solve difficult challenges. We have had recent collaborations with the following divisions:

- Center for Computation and the Brain
- Center for Language Sciences
- Center for Visual Science
- Goergen Institute for Data Science
- Department of Brain and Cognitive Sciences
- Department of Linguistics
- Laboratory for Laser Energetics
- University of Rochester Medical Center
- Warner School of Education

Learn More

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