



**IUCR/CERCS: NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH CENTER IN
EXPERIMENTAL RESEARCH IN COMPUTER SYSTEMS**

PROSPECTUS

OVERVIEW

The Center for Experimental Research in Computer Systems (CERCS), a joint effort between the College of Computing (CoC) and the School of Electrical and Computing Engineering at the Georgia Institute of Technology has been designated as an Industry-University Cooperative Research Center (IUCR/CERCS).

IUCR/CERCS addresses the information grids of the future, by bringing together researchers with knowledge of the key technologies underlying these systems, and thereby, create research teams that can address such systems and applications in a fashion that is integrated across multiple technologies and heterogeneous system components. Our research focuses on the design and evaluation of computer and software systems through experimental methods. We seek to conduct research in which new technologies are evaluated experimentally, with large-scale applications and on systems of substantial size or complexity. The aim is to understand the challenging application requirements that cause novel system-level research, where insights at the system level motivate changes in how certain applications are implemented, and where new system technologies enable new classes of applications. Constituting one of the largest experimental systems programs in the U.S., IUCR/CERCS has a mission to:

- promote experimental research in computer and software systems,

- foster high impact and multi-disciplinary research efforts using shared personnel and facilities,
- produce high quality students trained in the experimental method of systems research and development, and
- support researchers and educators at Georgia Tech and in affiliated institutions.

Recently through a competitive peer-review process, IUCR/CERCS has been awarded status as an NSF Industry University Cooperative Research Center for EXPERIMENTAL RESEARCH IN COMPUTER SYSTEMS. We invite you to participate in the programs supported by the IUCR/CERCS center, including our cooperative research program, our internship program, and special initiatives targeting our industry collaborators. We also invite you to participate in our annual IUCR/CERCS Industry Workshop (typically held in October), where you will have ample opportunity to meet our students, staff and faculty, as well as fellow participants from industry and government agencies. Your participation is essential to defining a successful R&D agenda for our joint efforts!

MEMBERSHIP REQUIREMENTS AND BENEFITS

Membership Requirements

All of the Center's activities are collaborations between university personnel and sponsoring organizations, both industry and government. The Industry Advisory Board (IAB)—which represents the collective vision of the sponsoring industry and government organizations—guides the directions of the Center's research and education programs. The IAB is the linkage between academia and practical deployment of new approaches, models and technologies. The IAB helps identify research problems, and members' staff collaborate with IUCR/CERCS faculty/staff to formulate means for solving a problem, thus providing transfer of information. IUCR/CERCS also takes effective steps to achieve practical application and ensure that intellectual property is reasonably available for member's use. Much of the Center's funding is provided by a \$45,000 annual sponsorship fee paid by members.

Membership Benefits

Technology Transfer:

- Cost-effectiveness in leveraging our substantial research budget.
- Identify potential employees by contact at the center or by internships at member facilities.

- Access to faculty expertise which provides a window on future advances in science and technology and help in solving current specific problems.
- Access to specialized research facilities and available trained personnel.
- Participate in the Industry Workshop, which include demos, project presentations, and proposals for new research.
- IAB members play a substantial role in planning and overseeing the research program.
- Advise IUOCR/CERCS on strategic directions in its research and educational programs.
- Extended staff visits resulting in significant mutual benefits.

Non-research goals

- Professional development service to members research department staff
- Participate in research endeavors with other industrial leaders.
- Member firms in niche markets may seek out new markets and colleagues
- Transcend individual faculty and provides new opportunities

The following are two examples of benefits that were generated as part of our past joint work with companies and government agencies:

1. A Cancer Information Web Site was set up in response to a request by NIH, which wanted cancer patients to have immediate access to new research results, but did not want to have NIH itself have to maintain the patient information required to determine which patients would need access to which research results.
2. A new method for the rapid transport of XML-formatted data was instituted in the experimental testbed maintained at Delta Air Lines, substantially reducing the bandwidth needs and server system costs projected by future XML usage.

CURRENT FUNDING COMMITMENTS AND NEEDS

Industrial membership fees will be used to support graduate students and staff on projects that are of interest to the IAB. The remaining funds will be used for faculty travel support to member facilities, Center operation, and information dissemination, such as web pages, the CERCS intern program, and annual meetings.

CURRENT CERCS EQUIPMENT

CERCS maintains a large collection of high-end computing, networking and interactive display/capture equipment for general research use in our shared laboratory spaces. The computing infrastructure includes multiple computational clusters (32- 64-, and 128-processor Intel- based arrays) interconnected with multiple networking technologies (Infiniband, ATM, Fast and Gigabit Ethernet), special purpose equipment for research in multicore systems, in power management, on high end networks, and others, along with many general high-end workstations.

An Interactive Systems lab permits our researchers to conduct teleconferences with external partners, and high end display equipment enables research in large scale data visualization.

The CERCS resources are connected via Gigabit Ethernet backbone to major complementary facilities at Georgia Tech and with Internet II and some dedicated links to our remote partners at the DOE National Labs.

FACULTY/STUDENTS

EDUCATION

CERCS faculty teach a large variety of graduate and undergraduate courses. The undergraduate courses are intended to provide students with the tools to be successful in both graduate school and in their chosen professions. Some undergraduate electives are prerequisites to graduate sequences, or are required for a particular specialization area. The graduate course offerings are for both Masters- and Ph.D.-level students in the Computer Science or Computer Engineering areas.

CERCS students have their homes either in the College of Computing or the School of Electrical and Computer Engineering at Georgia Tech. Currently there are seventy-five graduate students.

STUDENT PLACEMENT PROGRAM

IUCR/ERCS has established a internship program (CIP) which creates opportunities for graduate students to perform research in public and private sector environments. CIP is housed in the IUCR/CERSC Office and is chaired By Professor Karsten Schwan, Director.

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