COMPUTING RESEARCH NEWS

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Microsoft Research

By Daniel T. Ling

The seventh in a series of CRN *articles describing the activities of CRA's industry laboratory members*.

In 1991, when Microsoft was still a fairly small company and many businesses were scaling back their research efforts, Microsoft made a strong commitment to basic research in computer science by establishing the first research lab by a software company.

It reflected the recognition that the age of the microprocessor had only just begun and that improvements in silicon, storage, and communications technology, combined with the right software, would continue to dramatically transform every aspect of our lives. Over the past ten years, the lab has grown substantially and has contributed to almost every major product at Microsoft. We now have more than 500 researchers working on a wide range of projects–from quantum computing to operating systems, from programming languages and tools to signal-processing and speech recognition.

Microsoft Research (MSR) maintains four laboratories scattered across the globe: our main facility near the Microsoft corporate campus in Redmond, Washington, and facilities in San Francisco, Cambridge (United Kingdom), and Beijing. The Bay Area Research Center (BARC) in San Francisco was started in 1995. An exciting project from BARC is TerraServer (see http://www.terraserver.microsoft.com), one of the world's largest online databases containing about 3TB of satellite, aerial photography, and topographic maps from around the world. This effort involved close cooperation with the U.S. Geological Survey (USGS), which provided the majority of the data for the United States. For their work, Jim Gray and Tom Barclay were recognized by USGS with the John Wesley Powell award.

Two years later, in 1997, we started our lab in Cambridge, which maintains close ties with Cambridge University. The Cambridge Lab conducts research in a number of areas, including programming languages, computer vision, learning, and systems. Their work on information retrieval has made important contributions to Microsoft products.

In 1998 we founded the lab in Beijing, which collaborates with many universities and research institutions in China and elsewhere in Asia. The Beijing lab focuses on two main areas: multimedia, and making computers vastly simpler for speakers of Asian languages. An exciting research result to come out of Beijing is a fundamental understanding of the

Daniel Ling

sampling issues in the new image-based rendering approach to computer graphics.

MSR has a goal to research technologies that we believe will drive changes in computing over the next decade. As an industrial laboratory, our key focus is to work closely with the Microsoft development groups and support the corporate vision of "empowering people through great software any time, any place, and on any device." Over the past decade we have made many contributions to Microsoft products and services.

Our research in data-mining and databases has resulted in a number of contributions to SQL Server, including novel self-tuning components in SQL Server that allow SQL to adapt automatically to changing query workloads. The system uses the actual workload and the query optimizer to perform "what-if" analysis on new configurations, suggests changes to the user, and can implement them automatically if desired. Our work with the SQL Server team also resulted in new data-mining features built into the database, including algorithms from MSR, a query language for data-mining, and a programming interface for third-party components.

We are also making significant contributions in the natural language area, working closely with our product group partners. This has resulted in the grammar-checking capabilities that first appeared in Word95, as well as new features in the upcoming version of Office. Karen Jensen and George Heidorn, who founded the Natural Language Processing group, were among the earliest researchers to join MSR, even before its official creation. The group is now undertaking an ambitious project to create a rich semantic network to support more complex natural-language-understanding tasks such as machine translation.

Two years ago, MSR started the Programmer Productivity Research Center led by Amitabh Srivastava. We recognized the need

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Inside CRN

Transitions in Washington

By Lisa Thompson

On January 20, George W. Bush became the President of the United States, after a very short transition period—incoming presidents usually have more than two months to make transition plans. In most cases, a transition team is put together and members fan out across the federal government, assembling briefing papers for every cabinet department and independent agency. Tradition dictates that the outgoing Administration be cooperative within reason. The briefing papers alert the President and his new team to the major issues associated with each executive function. Many transition team members end up with jobs in the new Administration.

One of the side affects of President Bush's truncated transition is that fewer appointment decisions have been made as the President sits down in the Oval Office for the first time. Most cabinet-level officials have been named, but the process of sub-cabinet appointments is further behind. In particular, as of press time no appointments had been made for the Office of Science and Technology Policy. This is not altogether unusual, however. Although President Clinton named a Science Adviser shortly after his first election, few chief executives before him bothered to do so at an early point.

As expected, President Bush made education his first major initiative. As we go to press, however, there is little information regarding what directions the President will take with respect to science and research policy. Neither is there a long-term decision about who will run the National Science Foundation. Current Director Rita Colwell is apparently staying on, at least until further notice.

Moreover, the regular budget cycle will be pushed back. The Presidential budget is usually released in early February, but it is likely to be March before we see a detailed fiscal plan from the Bush Administration.

Congress, too, has undergone some significant changes, and the 107th Congress will look decidedly different from its predecessor. This is partly due to the outcome of the 2000 election, but also to the initial effects of a rules change, made when the Republicans took over House leadership in 1995, that imposed a six-year term-limit on committee chairmanships.

The most significant aspect of this change for the computing research community is that the term of the long-time Chairman of the Judiciary Committee expired. This allowed the chairmanship to pass to the second-most-senior committee member, who happens to have been the Chairman of the House Science Committee, James Sensenbrenner (R-WI).

Rep. Sherwood Boehlert succeeds Sensenbrenner as Chairman of the Science Committee. Boehlert is a ten-term Congressman from New York who has been an active member of the Science Committee for many years.

In his first speech to the Washington science policy community, Boehlert said, "I want to build

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CRA Elects New Officers to Two-Year Terms

Effective July 1, 2001, James D. Foley (Georgia Institute of Technology) will become board chair of the Computing Research Association. Janice Cuny (University of Oregon) assumes the duties of Vice Chair. The treasurer will be John Stankovic (University of Virginia), and Kathleen McKeown (Columbia University) will become secretary. Officers serve two-year terms (July 1, 2001 to June 30, 2003).

James D. Foley is Associate Dean, College of Computing; Professor, College of Computing and School of Electrical and Computer Engineering; and Chair of the Georgia Research Alliance; all at the Georgia Institute of Technology. A CRA board member since 1996 and a member of the executive committee and treasurer since 1998, Dr. Foley has also served on the elections, industry, and government affairs committees. He co-chaired the 1998 Snowbird Conference, and served on the program committee for Snowbird 2000.

James Foley

Dr. Foley is a Fellow of IEEE and ACM, and a member of Phi Beta Kappa, Tau Beta Pi, Eta Kappa Nu (Electrical Engineering), and Sigma Xi. His research interests include computer graphics, information visualization, human-computer interaction, and management of technology. Previous positions include Executive Director and then CEO, Yamacraw Economic Development Mission, State of Georgia; Chairman and CEO, Mitsubishi Electric Information Technology Center America; Director, MERL - Mitsubishi Electric Research Laboratory; Professor, College of Computing and Director, GVU Center, Georgia Tech; and Chair, Department of CS&EE, George Washington University. Dr. Foley earned a Ph.D. in computer, information and control engineering from the University of Michigan.

Janice Cuny, Associate Professor of Computer and Information Science at the University of Oregon, joined the CRA board in 2000. She chairs the Habermann Award Committee and the Recruitment and Retention Women's Study Group, and was a member of the CRA Minority R&R Study Group. A CRA-W member since 1993, Professor Cuny served a term as co-chair of the committee. She has been actively involved in CRA-W Faculty Mentoring Workshops and currently works on CRA-W funding. For three years, she chaired the selection committee for CRA Undergraduate

Janice Cuny

Awards, and has served on several panels at CRA Academic Careers in Computer Science Workshops. Jan Cuny has also been a mentor in CRA-W's Distributed Mentoring Program.

Jan Cuny received the National Science Foundation Faculty Award for Women and the IBM Faculty Development Award, and was selected for the IEEE Distinguished Visitor Program. She was a co-founder of the University of Oregon Computational Science Institute and has served as its Co-Director. She was previously a faculty member at Purdue and the University of Massachusetts. Her research interests include parallel and distributed programming environments; debugging and profiling tools; and domain-specific support for the geological sciences. Professor Cuny has a Ph.D. in Computer Science from the University of Michigan.

John A. Stankovic is BP America Professor and Chair, Department of Computer Science, University of Virginia. Elected to the CRA board in 1996, he currently chairs the Recruitment and Retention Committee. He has served

John Stankovic

as chair of both the Communications Committee and the CRA Distinguished Service and the Habermann Awards Committees. Professor Stankovic has been active in CRA Snowbird Conferences, serving as program co-chair in 2000 and as a member of the program committee in 1998. In addition, he conducted the New Chairs Workshop at Snowbird in 1998.

Professor Stankovic is a Fellow of IEEE and ACM, and a winner of the Outstanding Scholar Award, School of Engineering, University of Massachusetts. He also received the IEEE Computer Society's Meritorious Service Award in 1991 and the IEEE Real-Time Systems Technical Committee 2000 Award for outstanding technical contributions and leadership. In addition, Professor Stankovic is a Distinguished Member, Scientific Advisory Board, Swedish National Strategic Real-Time Initiative; Editor-in-Chief, *IEEE Transactions on Parallel and Distributed Systems*, and Co-Editor-in-Chief and Co-Founder, *International Journal on Real-Time Systems*. His research interests include real-time computing; operating systems; distributed computing; and real-time databases. Professor Stankovic was awarded a Ph.D. in computer science from Brown University.

Kathleen R. McKeown, Professor and Chair of the Department of Computer Science at Columbia University, has been a CRA board member since 1999. She currently co-chairs the External Awards Committee, and co-chaired the New Chairs Workshop at Snowbird 2000. Professor McKeown is a Fellow of the American Association of Artificial

Kathleen McKeown

Intelligence. She was named Outstanding Woman Scientist, Association for Women in Science, New York 2000. Professor McKeown received the NSF Faculty Award for Women and the NSF Presidential Young Investigator Award. She also was an invited speaker at the International Joint Conference on Artificial Intelligence in Japan in 1997.

Professor McKeown has served as President, Vice President, and Secretary/Treasurer of the Association for Computational Linguistics. She has co-chaired the program committee, American Association for Artificial Intelligence, and been an elected officer of the American Association for Artificial Intelligence. Her research interests include natural language processing; natural language generation; digital libraries; text summarization; and multimedia explanation. Professor McKeown received a Ph.D. in computer science from the University of Pennsylvania.

CRA heartily thanks the members of the current executive committee for their service during the period July 1999 to June 2001—Ed Lazowska (University of Washington), chair; Mary Lou Soffa (University of Pittsburgh), vice chair; Jim Foley (Georgia Institute of Technology), treasurer; Leah Jamieson (Purdue University), secretary; and Sid Karen (UC San Diego), appointed member.

CRA Conference at Snowbird
July 14-16, 2002

Mentoring Graduate Students

By W. Brad Johnson

Strong mentor relationships between graduate students and faculty members are essential for both the professional development and personal growth of graduate students in computer science.

Mentor relationships, or "mentorships," are personal relationships in which a more experienced faculty member acts as a guide, role model, teacher, and sponsor of a less experienced graduate student. Good mentors provide student protégés with knowledge, advice, challenge, counsel, and support in the protégé's pursuit of becoming a full member of the profession. Although a great deal of educational outcome research shows that mentorships lead to tangible graduate school and career advantages, mentorships are not prevalent in all graduate departments, and not all faculty mentors are either skilled or ethical in the delivery of mentor functions.

In this short article, I summarize the main findings from outcome research related to graduate student mentoring, and highlight the key behaviors of excellent mentors. I then discuss several reasons why even excellent mentorships may pose real ethical dilemmas, and I recommend some strategies for graduate programs in the computer sciences relevant to both accelerating the prevalence of mentorships between students and faculty, and minimizing the risk of poor or unethical mentoring.

Outcomes of Mentoring in Graduate School

The first empirical data regarding the benefits of mentoring was a large-scale survey of successful executives listed in *The Wall Street Journal* (Roche 1977). Among 1,250 top executives, two-thirds had enjoyed a significant mentorship. Strikingly, those who reported having a mentor earned higher salaries, were more rapidly promoted, and were significantly more satisfied with their careers *and* their lives in general. In the last decade, research bearing on graduate school mentorships indicates that graduate students who are mentored enjoy several clear advantages at both the predoctoral and postdoctoral stages of professional development.

Predoctoral mentoring benefits include:

- Professional skill development—graduate students "learn the ropes" of the profession by watching and being directly coached by their mentors.
- Professional confidence and identity development—students overcome the *imposter syndrome* and begin to accept an image of themselves as competent.
- Networking—mentored students enjoy more professional connections and opportunities both within and beyond their own department.
- Productivity—mentored students are significantly more likely to present papers and publish articles.
- Dissertation success—excellent mentors have a track record of getting protégés graduated on time.
- Affirmed dreams—mentored students appear to exit graduate school affirmed in their talents and encouraged to pursue career aspirations.
- Program satisfaction—mentored students consistently report greater satisfaction with their doctoral program.

Postdoctoral mentoring benefits include:

- Higher income.
- More rapid promotion and career mobility.
- Career "eminence"—mentored students are more likely to gain notoriety in their fields.
- Career satisfaction.
- Creative achievement—good mentors foster and promote creative innovations.
- More collaboration with colleagues.
- Learning to mentor—mentored graduates are significantly more likely to mentor others in the field themselves.

Finally, research suggests that mentors having the greatest impact are well-cited and active scholars. Mentorships are also most helpful when they begin early in graduate school, result in dissertation sponsorship, and continue after graduation (Ragins & Cotton, 1999).

What Excellent Mentors Do

Excellent graduate school mentors are generally intentional about the mentoring enterprise, that is, they carefully consider the needs of a prospective protégé, the potential match between the two, and whether or not they have the resources (e.g., time, energy, grant funds) to successfully support a protégé through the doctoral program.

Excellent mentors provide two general categories of mentor functions (Kram, 1985). *Career functions* are those aspects of the relationship that contribute to learning the ropes and preparing for advancement. Career functions include sponsorship, coaching, challenge, provision of exposure/visibility (within the department and beyond), and (when needed) protection.

Psychosocial functions are the mentoring strategies used to enhance a protégé's sense of self-esteem, professional identity, and sense of competence. Important psychosocial functions include role modeling, acceptance-and-confirmation, counseling and friendship or mutuality. Both career and psychosocial functions are essential components of good mentorships. Excellent mentors pay careful attention to protégés, assess which functions are most relevant at specific times, and provide these functions in good measure.

Unique Ethical Concerns in Graduate School Mentorships

Although tremendously important, and clearly linked to tangible outcome variables, mentor relationships in graduate settings also pose some unique ethical quandaries for students and faculty (Johnson & Nelson, 1999). Research indicates that the best mentorships are long-term, emotionally complex, and multifaceted (the pair interact in multiple settings over several years).

Unfortunately, the mutuality and intimacy fostered in these relationships may create conditions ripe for ethical violations—particularly in cross-gender relationships. Furthermore, the best mentor relationships are *informal*, or formed without intervention from the graduate department, and the factors contributing to mentorship formation have a great deal to do with attraction or "chemistry" (e.g., shared interests, interpersonal matching). In addition to factors such as attraction at the outset and increasing intimacy and complexity as a mentor relationship unfolds, mentorships seldom have a clear termination point. There is a perpetual quality to graduate school mentorships in that students often rely on mentors for advice, counsel, support and a continuing collegial relationship long after the degree is awarded.

These characteristics of graduate school mentorships contribute to at least five salient ethical quandaries faced by faculty who mentor and the graduate departments that support them.

1. *Competence to Mentor*: What makes a faculty member a suitable mentor for graduate students? Rarely are faculty members trained to mentor graduate students, and frankly, some are not very good at it. Graduate faculty who are themselves immature, personality impaired, or who demonstrate poor interpersonal boundaries, are at risk of harming (or at the very least not helping) graduate students.
2. *Truth in Advertising*: Recognizing the attractiveness of mentoring relationships to prospective graduate students, many doctoral programs now claim explicitly (in glossy promotional brochures) or implicitly (during interviews with program applicants) that students enjoy close mentoring relationships with program faculty. Is this true? Is there program outcome data to support such claims?
3. *Equal Access to Mentoring*: Given the clear benefits of mentoring in graduate school, an obvious concern is the degree to which all students have access to mentors. Are men and women just as likely to form productive mentorships with faculty? What about ethnic and racial minority students, gay and lesbian students, and mid-life (returning) students?
4. *Exploitation*: Considering the intimacy and mutuality characteristic of mentoring, as well as the clear power differential inherent in the relationship, it is perhaps not surprising that faculty mentors occasionally exploit graduate students. Exploitation can take many forms. Protégés may be exploited sexually, emotionally (faculty disclose inappropriately), and academically (faculty may take credit for a protégé's work, or demand that a protégé work excessive hours in exchange for good recommendations).
5. *Multiple Relationships*: Graduate school mentorships are characterized by multiple modes of interaction between mentor and protégé (e.g., classroom, research lab, professional conference, staff room, social gathering). Faculty may also be tempted to engage protégés in more than one kind of relationship (e.g., graduate student and business partner or romantic interest). In general, multiple relationships pose serious ethical risks.

Some Recommendations: What Graduate Departments Can Do

There are clearly no quick solutions to the ethical concerns outlined above. Still, graduate programs in the computer sciences can work to enhance the prevalence and quality of graduate student mentoring while simultaneously reducing the risk of adverse mentoring outcomes. Here are four brief recommendations:

1. *Promote a Culture of Mentoring*: Excellent graduate programs nurture a mentoring-rich environment when senior faculty serve as exemplars of good mentoring. These programs also actively monitor and assess prevalence and effectiveness of mentorships, and acknowledge and reward outstanding mentors. At least some of these rewards are explicit (awards, salary increases, load credit, weight toward promotion).
2. *Attention to Faculty Selection*: Not all professors make good mentors. Exceptional graduate programs are serious when it comes to evaluating a prospective faculty member's mentoring aptitude. That is, does he or she have solid interpersonal skills, an understanding of

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Expanding the Pipeline

Reaching Out to Create Diversity in Science: San Diego Supercomputer Center

By Nicole Batchelor

Nationwide, there are numbers of programs designed to provide outreach to women and girls interested in scientific careers—some more successful than others. At the San Diego Supercomputer Center (SDSC), Senior Staff Scientist Rozeanne Steckler and Senior Principal Scientist Mike Bailey have spent more than a decade mentoring and teaching girls through a number of tailored programs, many of which have been scaled to reach from hundreds to thousands of girls.

"The world of science should reflect our diverse society," Steckler says. To see the scientific infrastructure become more integrated into this societal change, Steckler and Bailey have created several educational outreach programs geared toward youth, particularly those of underrepresented groups such as females.

"The best time to get girls interested in science is early, in the seventh grade, when they begin studying algebra," Steckler says. "This is the time when math is a little more abstract, and girls prefer learning things that have relevance. Once we address this relevance, they are much more interested in math and science courses."

Steckler's passion for inspiring scientific interest in females and minorities stems from her own interests. "I didn't grow up building things," she says. "But I was intrigued by the analytical nature of math and science. I always enjoyed problem solving, particularly setting up proofs, and solving puzzles and algebraic equations. Because I enjoyed it so much and was able to succeed at it, I would like to get more girls involved in science so they can share the same rewarding experience."

The major funding agency for SDSC, the National Science Foundation (NSF), has long been committed to increasing female and minority participation in the sciences. Partly in response to NSF's interest, Steckler and Bailey began the Science Enrichment Program in 1989. It was their hope that through such a program, females and minorities would begin to receive greater exposure to the sciences. They partnered with the San Diego-Imperial Council of Girl Scouts, which provided the ideal infrastructure for the program and shared the mission of encouraging girls to be come interested in science.

The Science Enrichment Program (http://enrich.sdsc.edu/) has grown over the past 12 years, but has maintained a steady focus of providing students with a hands-on study of science. The goal has been not only to increase awareness and knowledge of science in underrepresented groups, but also to sustain interest by making the activities accessible and enjoyable. Science Enrichment Programs have included several different emphases over the past decade:

- Girl Scout Science Interest Group and Science Scholars Program
- Girls are GREAT Collaboration
- Middle School Program
- Envision, Explore, Engage

Girl Scout Science Interest Group and Science Scholars Program

The first Science Enrichment Program was the Girl Scout Science Interest Group, created in 1989 for San Diego girls in the 7th through 10th grades who expressed an interest in science. "In addition to regular Girl Scout activities, I wanted the San Diego-Imperial Girl Scout Council to include science projects," Steckler explains. "For a variety of cultural, economic, and family reasons, many girls—especially minority girls—have a limited concept of what being a scientist means and what it takes to become one."

From 1994 to 1997, the Science Interest Group expanded to become the Science Scholars Program, targeted to young girls of underrepresented groups. The program was so successful that the team began to see a need to provide opportunities to even more students. Initially designed for the participation of 15 girls at the junior and senior high-school level, the program was expanded again by partnering with the Girl Scouts, as well as with San Diego City schools. Today, the program flourishes across San Diego County.

Girls Are GREAT Collaboration

Steckler and Bailey later became involved with the Girl Scouts' Girls are GREAT program. They added activities in science and engineering to that program, which targets second- to eighth-grade minority girls in the inner city and border communities of San Diego County. Approximately 5,600 participants are learning firsthand about science by creating their own projects. SDSC's involvement includes developing curriculum, providing equipment, and training the Girl Scout staff and volunteer leaders. The staff members and leaders have attended sessions to acquire scientific knowledge in order to make the program self-supporting. The curriculum includes chemistry, computer science, Earth science, engineering, life science, and physics. Within these disciplines, students learn about such subjects as DNA, earthquakes, and solar energy.

The Girls are GREAT Family Science Night was started in 1998 to encourage family involvement in students' education and activities. Parents and siblings, as well as extended families and communities, are invited to experience the girls' activities. "Studies have shown that family support is very important to a child's success in school," Steckler says. Each girl participating in the event receives a Science in a Bag kit, which includes an experiment activity she can share with her family. These kits also include science toys, such as magnets, magnifying glasses, and slinkies. Attendance at the last Family Science Night event was 300.

Steckler and Bailey have received numerous honors for their work, including the Girl Scout Council's Spirit Award twice, in 1992 and 2000. "Rozeanne Steckler has done wonders with our members to bridge the digital divide," says Deb Baker, director of communications for the Girl Scout San Diego-Imperial Council. "She has contributed greatly to our goal of seeing successful girls become successful women."

Sid Karin, director of SDSC and a CRA board member, is very supportive of these programs. "Reaching a large number of girls and young women, inspiring them to consider scientific careers through exposure and participation in programs of this high quality and focus, is helping solve a serious problem in this country—the problem of ensuring that students of all backgrounds consider academic and career opportunities in science and engineering."

Middle School Program

Striving to expose young people to the curiosities of science, the Middle School Program provides education and resources to San Diego County middle school teachers in order to accomplish this goal. The teachers administer after-school science enrichment programs to approximately 250 male and female minority students. Since attendance is optional, the program includes interesting activities within an engaging curriculum that is developed with input from teachers. Topics studied include motion and forces, energy and energy transfer, electronics and electricity, optics, and rocketry.

The experiments performed by the students are designed to approach science in a non-intimidating manner. For instance, students are introduced to electricity by allowing them to explore series and parallel circuits using a simple circuit kit. Students receive invaluable practice in problem solving, critical thinking, and teamwork—all of which are requirements for being successful in science.

Envision, Explore, Engage (E3)

Inspired by the comments of a K-12 educator, Steckler is now leading an effort to develop an interactive CD-Rom of lessons in molecular science, computer science, neuroscience, Earth science, and engineering designed for teachers and students in grades 6 through 8. SDSC is the lead institution in a nationwide partnership, the National Partnership for Advanced Computational Infrastructure (NPACI). NPACI researchers are developing cutting-edge software and infrastructure for the scientific community—the goal of E3 is to make this information available to the K-12 community.

Under Steckler's leadership, K-12 educators Anna O'Neil and Danine Ezell, along with a team of community college students, are crafting the content of the CD-Rom. "Considering some of the textbooks that are used to teach science, it's no wonder young people are perplexed by the subject," says O'Neil, an award-winning teacher who is leading the development of the curriculum in the molecular-science portion of the project. "Students are taught numbers and formulas, with no point of reference. The material needs to be translated into understandable terms." Because the project is situated in an environment (the Internet) to which many of today's youth can relate, the team expects this latest outreach

Expanding Pipeline
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New CRA Members

7/1/00 to 1/31/01

CRA is pleased to welcome the following departments as members:

Academic Members

Bradley University (CS)
Bryn Mawr College (MCS)
California State Polytechnic University (CS)
College of Charleston (CS)
Colorado Technical University (CS)
Georgia Institute of Technology (ECE)
Grinnell College (MCS)
Harvey Mudd College (CS)
Indiana University (I)
Pennsylvania State University (IST)
Rochester Institute of Technology (CS)
University of California, Berkeley (IMS)
University of Michigan (I)
University of Minnesota, Duluth (CS)
University of Puerto Rico, Mayaguez (ECE)
University of Washington (I)
University of Washington, Bothell (CS)
University of West Florida (CS)
Wesleyan University (CS)

Lab and Center Members

Institute for Human and Machine Cognition
National Center for Atmospheric Research

1999-2000 Taulbee Survey

Current and Future Ph.D. Output Will Not Satisfy Demand for Faculty

By Randal E. Bryant and Mary Jane Irwin

This article and the accompanying tables present the results of the 30th CRA Taulbee Survey[1] of Ph.D.-granting departments of computer science (CS) and computer engineering (CE) in the United States and Canada. This survey is conducted annually by the Computing Research Association to document trends in student enrollment, employment of graduates, and faculty salaries.

Information is gathered during the fall and early winter. The period the data cover varies from table to table. Degree production (Ph.D., Master's, and Bachelor's) and total Ph.D. enrollments refer to the previous academic year (1999-2000). Data for new students in all categories and total enrollments for Master's and Bachelor's degrees refer to the current academic year (2000-2001). Projected student production and information on faculty salaries and demographics also refer to the current academic year. Faculty salaries are those effective January 1, 2001. Responses received by January 14, 2001 are included in the tables.

The survey results represent input from Ph.D.-granting departments only. A total of 214 departments were surveyed, compared with 203 departments last year. Overall, the response rate was 81% (173 departments), a slight improvement over the past several years (Figure 1). The return rate of 6 out of 28 (21%) for CE programs is once again very low. We attribute this low response to two factors: 1) many CE programs are part of an ECE department, and they do not keep separate statistics for CE vs. EE, and 2) many of these departments are not aware of the Taulbee Survey or its importance. The response rates for US CS programs (148 of 163, or 91%), and for Canadian programs (19 of 23, or 83%) were very good.

We thank all respondents who completed this year's questionnaire. Departments that participated are listed at the end of this article. Due to the low return rate for CE, we caution against drawing strong conclusions from the presented data for CE. In our discussion, we will focus on the combined numbers for CS and CE. Since a net of 17 more departments reported this year than last, some of our statistics should be expected to rise.

This article presents the most significant results of the survey, with particular attention to those that differ markedly from last year or that appear to indicate long-term trends. The continued low response rate for CE departments (21% for the last two years) makes trend analysis for CE risky. Overall, the set of schools that responded this year was very similar to last with some additions. For more details on how the faculty salary information is to be interpreted, see the article in the January 2001, *CRN* on Preliminary Taulbee Faculty Salary Data (http://www.cra.org/CRN/issues/0101.pdf). [Note that in the printed version of this January *CRN* article the labels in the left-hand column of Table 7 were incorrect. These have been corrected in the online version of the January 2001 article and in Table 30 of this current article.]

The survey form itself is modified slightly each year to ensure as high a rate of return as possible (by simplifying and clarifying), while continuing to capture the data necessary to understand trends in the discipline and also reflect changing concerns of the computing research community. This year the only changes were minor rewordings of some questions.

Figure 1. Number of Respondents to Faculty Salary Questions

Year	US CS Depts.	US CE Depts.	Canadian	Total
1995	110/133 (83%)	9/13 (69%)	11/16 (69%)	130/162 (80%)
1996	98/131 (75%)	8/13 (62%	9/16 (56%)	115/160 (72%)
1997	111/133 (83%)	6/13 (46%)	13/17 (76%)	130/163 (80%)
1998	122/145 (84%)	7/19 (37%)	12/18 (67%)	141/182 (77%)
1999	132/156 (85%)	5/24 (21%)	19/23 (83%)	156/203 (77%)
2000	148/163 (91%)	6/28 (21%)	19/23 (83%)	173/214 (81%)

CORRECTION: In the January 2001 edition of *CRN*, p. 5, the headings in Table 7 for the Taulbee Survey were incorrect. The correct headings under "Faculty Rank" are: (1) Non-Tenure Teaching Faculty; (2) Assistant; (3) Associate; and (4) Full.

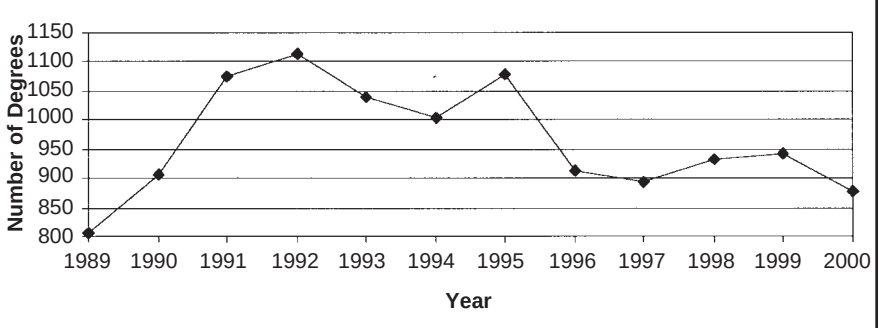
Ph.D. Degree Production and Enrollments *(Tables 1-8)*

As shown in Table 1, a total of 881 Ph.D. degrees were awarded in 2000 by the 173 responding departments. As Figure 2 indicates, this is the lowest number in more than 10 years, and it reverses the trend of moderate increases for the past several years.

The prediction from last year's survey that 1,167 Ph.D. degrees would be awarded in 2000 was, as usual, overly optimistic. In fact, it was more optimistic than usual. Last year there were 944 degrees awarded compared with the prediction from the prior year of 1,128, a ratio of 0.84, whereas this year's ratio is 0.75. This range of "optimism ratios" means we would expect the number of degrees next year to be somewhere between 860 and 965, based on the estimate for next year of 1,142.

As we will see later, this decrease is somewhat alarming when considered in light of the high demand for undergraduate and masters education indicated in the survey, as well as the faculty recruiting plans of the schools that will provide these programs.

Figure 2. Ph.D. Production



The Ph.D. production picture is not as gloomy if we consider the other statistics for Ph.D. programs. All other trends for future Ph.D. production show increases. The number who entered Ph.D. programs (Table 5) increased from 1,890 to 2,062 (9% increase); the number who passed qualifiers increased from 930 to 1,119 (20% increase—Table 1); the number who passed their thesis proposal exams increased from 770 to 788 (2% increase—Table 1); and the total Ph.D. enrollments (Table 6) increased from 7,160 to 7,857 (10% increase). These statistics indicate an improving long-term supply, which is consistent with the study done by Zweben (*CRN*, September 1999) showing that one must look beyond the annual production of Ph.D. degrees to determine long-term Ph.D. trends. Still, we can see that the production of new Ph.D. degrees will, at best, increase only slightly over the next several years.

Table 4 shows area of specialization versus types of first appointments for Ph.D. recipients in 2000. These statistics are also very similar to those from last year. The only significant change is the increase in the number of recipients in the area of OS/networking (from 107 to 141), with most of the increased supply going to industry, but some to university research positions. In light of the number of new Ph.Ds in both years' surveys whose areas and/or employment is "unknown," we caution against drawing any strong conclusions.

Most statistics on gender and ethnicity for Ph.D. students (Tables 2, 3, 7, and 8) show remarkably little change from last year. White and nonresident-alien men continue to account for a very large fraction of

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Table 1. Ph.D. Production by Type of Department and Rank

Department, Rank	Ph.D.s Produced	Ave. per Dept.	Ph.D.s Next Year	Ave. per Dept.	Passed Qualifier	Ave. per Dept.	Passed Thesis Exam	Ave. per Dept.
US CS 1-12	177	16.1	240	21.8	185	16.8	157	14.3
US CS 13-24	124	10.3	147	12.3	148	12.3	124	10.3
US CS 25-36	82	6.8	129	10.8	137	11.4	87	7.3
US CS Other	405	3.6	532	4.7	567	5.1	340	3.0
Canadian	79	4.2	76	4.0	59	3.1	53	2.8
US CE	14	2.3	20	3.3	23	3.8	27	4.5
Total	**881**	**5.1**	**1,144**	**6.6**	**1,119**	**6.5**	**788**	**4.6**

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Ph.D. production and enrollments. Women constitute a significant minority (18% of enrollments, 15% of graduates.) All other underrepresented groups are very small minorities. As Figure 3 illustrates, one important threshold was reached for the first time this year–fully 50% of the enrolled Ph.D. students are nonresident aliens. This increase has come with a corresponding decrease in the percentage who are "White, non-Hispanic." Of course, many other fields of engineering have long passed the 50% mark for foreign students, and so we see no cause for alarm.

Master's and Bachelor's Degree Production and Enrollments *(Tables 9-16)*

All statistics on Master's and Bachelor's programs show major growth. A total of 6,562 students received Master's degrees, an increase of 18%. The number of Bachelor's degrees increased to 14,822, an increase of 17%. As Figure 4 indicates, the number of students graduating with Bachelor's degrees has been increasing by approximately 2,100 each year for the past 4 years. This year's Master's production exceeded the projection from last year's survey by 14%, while Bachelor's production exceeded projections by 9%. If this trend continues, then next year's projected production of 15,988 Bachelor's degrees (Table 11) and 6,300 Master's degrees (Table 12) may be too low.

Large increases can be seen in the number of new undergraduate (11% increase) and Master's (19% increase) students, and in the enrollments in Bachelor's (17% increase) and Master's (21% increase) programs. Figure 5 shows that new undergraduate enrollments continue to reach historic highs. Some of these apparent increases may be caused by the increased number of departments responding to our survey, but even normalized statistics, such as the average number of new undergraduate majors per department, grew by 11%.

One interesting feature is that most of the increased enrollments in the United States have occurred in departments ranked above 36. In fact, the number of new undergraduate enrollments in departments ranked 1 through 24 actually declined slightly, while those ranked 25 and above had substantial growth. Schools classified as "US CS Other" now have 59% of the undergraduate students (up from 51% last year), and 71% of the Master's students (up from 66% last year.) For new enrollments, they account for 56% of the undergraduate students (up from 53%) and 65% of the Master's students (up from 57%). Apparently the "big name" schools have not been scaling up to handle the influx of students wishing to pursue computer science and engineering.

Most demographics regarding gender and ethnicity for Bachelor's and Master's students show remarkable stability when compared with last year's results. The only significant change is that the fraction of Master's degree recipients who are nonresident aliens increased by 5% to 52%, with a corresponding decrease in the number classified as "White, non-Hispanic." In fact, the number of White, non-Hispanic students receiving Master's degrees actually decreased by 6%.

Faculty Demographics *(Tables 17-23)*

The total number of faculty increased by 14% over the past year to a total of 4,939 (Table 17). This increase was reflected in almost all categories, except for the number of post-docs that actually decreased by 42. Considering that 115 faculty are reported to have left academia (Table 23), the survey indicates 775 new faculty this year. Some of these are due to the increased number of respondents to the survey. Our Ph.D. production shows only 273 graduates taking faculty positions (Table 4.) Some of the new teaching faculty may not have Ph.D. degrees, and some new faculty may have come from nonacademic sources.

This year's faculty growth to 4,939 was significantly greater than the prediction of 4,315 from last year's survey. This growth is greater

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Table 2. Gender of Ph.D. Recipients by Type of Degree

	CS		CE		CS&CE	
Male	689	(85%)	48	(86%)	737	(85%)
Female	123	(15%)	8	(14%)	131	(15%)
Total have Gender Data for	**812**		**56**		**868**	
Unknown	13		0		13	
Total	**825**		**56**		**881**	

Table 3. Ethnicity of Ph.D. Recipients by Type of Degree

	CS		CE		CS&CE	
Nonresident Alien	337	(45%)	32	(62%)	369	(47%)
African American, Non-Hispanic	14	(2%)	0	(0%)	14	(2%)
Native American or Alaskan Native	0	(0%)	0	(0%)	0	(0%)
Asian or Pacific Islander	73	(10%)	6	(12%)	79	(10%)
Hispanic	16	(2%)	1	(2%)	17	(2%)
White, Non-Hispanic	293	(40%)	13	(25%)	306	(39%)
Other/Not Listed	8	(1%)	0	(0%)	8	(1%)
Total have Ethnicity Data For	**741**		**52**		**793**	
Ethnicity/Residency Unknown	84		4		88	
Total	**825**		**56**		**881**	

Figure 3. Nonresident Aliens as Fraction of Ph.D. Enrollments

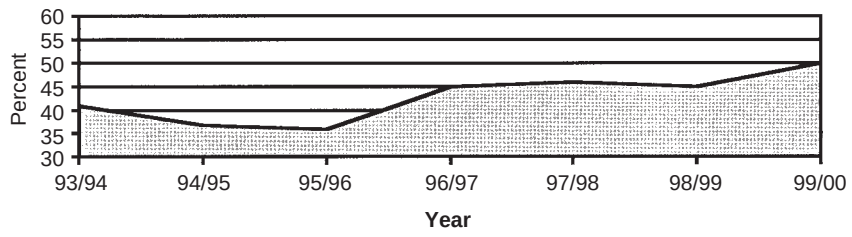

Table 4. Employment of New Ph.D. Recipients by Specialty

New Ph.D.s in Ph.D. Granting Depts.	Artificial Intelligence/Robotics	Hardware/Architecture	Numerical Analysis/Scientific Computing	Programming Languages/Compilers	OS/Networks	Software Engineering	Theory/Algorithms	Graphics/Human Interfaces	Databases/Information Systems	Other/Unknown	Total		
Tenure-Track	35	9	3	15	24	16	17	16	10	13	**158**	(22%)	
Researcher	6	9	1	4	10	0	7	5	7	3	**52**	(7%)	
Postdoc	10	2	0	1	3	1	8	5	5	5	**40**	(6%)	(38%)
Teaching Faculty	5	2	0	1	3	2	3	2	2	3	**23**	(3%)	
New Ph.D.s, Other Categories													
Other CS/CE Dept.	4	2	0	1	6	0	2	3	2	2	**22**	(3%)	
Non-CS/CE Dept.	5	0	0	0	1	0	0	0	1	0	**7**	(1%)	
Industry	54	37	10	26	83	50	20	26	34	19	**359**	(50%)	
Government	2	1	5	2	2	1	4	0	1	3	**21**	(3%)	(62%)
Self-Employed	2	0	0	1	1	1	0	0	0	1	**6**	(1%)	
Employed Abroad	5	5	0	4	2	0	1	4	2	3	**26**	(4%)	
Unemployed	0	0	1	0	0	0	0	2	0	0	**3**	(0%)	
Total have Employment Data for	**128**	**67**	**20**	**55**	**135**	**71**	**62**	**63**	**64**	**52**	**717**	**100%**	**100%**
Unknown	28	7	0	1	6	1	5	2	2	105	157		
Total	**156**	**74**	**20**	**56**	**141**	**72**	**67**	**65**	**66**	**157**	**874**		

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Table 5. New Ph.D Students in Fall 2000 by Department Type and Rank

	CS				CE				CS & CE	
Department, Rank	New Admit	MS to Ph.D.	Total	Ave. per Dept.	New Admit	MS to Ph.D.	Total	Ave. per Dept.	Total	Ave. per Dept.
US CS 1-12	338	42	380	34.5	0	0	0	0.0	380	34.5
US CS 13-24	299	34	333	27.8	0	1	1	0.1	334	27.8
US CS 25-36	268	21	289	24.1	0	0	0	0.0	289	24.1
US CS Other	749	99	848	7.6	71	8	79	0.7	927	8.3
Canadian	85	22	107	5.6	3	0	3	0.2	110	5.8
US CE	0	0	0	0.0	22	0	22	3.7	22	3.7
Total	**1,739**	**218**	**1,957**	**11.4**	**96**	**9**	**105**	**0.6**	**2,062**	**12.0**

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than can be accounted for by the increased number of survey respondents. For example, the number of faculty in the U.S. CS departments ranked 1 through 36 grew by 11%, whereas these departments predicted a 9% growth. In fact, it appears that many departments have established aggressive plans for recruiting over the next few years. Last year the surveyed departments predicted a 7% faculty growth over two years; this year, they predict 21% over 2 years on top of last year's actual growth. In light of our prediction that Ph.D. production will show, at best, modest growth over the next few years, it is difficult to see where departments will find these new faculty.

Table 23 on faculty "losses" showed that a large number took academic positions elsewhere. Only 115 actually left academia (2.3% of the total) through death, retirement, or taking a nonacademic position. This compares with 112 (2.6% of total) last year. These numbers counter the prevailing fear that many of our faculty are leaving academia and seeking their fortunes at start-up companies.

The demographic data for faculty (Tables 19–22) are very similar to those from last year. We see that the gender split of new faculty (84% male, 16% female) is very close to the split for new Ph.D. recipients (Table 2). However, the split is not uniform across faculty categories. New tenure-track faculty are slightly skewed toward males (88%), whereas new teaching faculty are significantly skewed toward females (26%).

It is interesting to compare the ethnicity data for new faculty (Table 20) to those for Ph.D. recipients (Table 3). Fully 58% of the new faculty are White, non-Hispanic, even though only 39% of the Ph.D. recipients are in this category. By contrast, only 17% of the new faculty are nonresident aliens, whereas fully 47% of the degree recipients are. Some new faculty could have become residents after receiving their Ph.D. degrees, but it seems clear that proportionately fewer foreign students take positions at U.S. universities.

Faculty Salaries *(Tables 24-30)*

The U.S. average salaries have increased by 7% for most categories of U.S. faculty, except for full professor salaries that grew by 4%. These increases are all higher than last year's numbers. Canadian salaries increased by 4%, 8%, 7%, and 3% for non-tenure track, assistant, associate, and full professors, respectively. These increases are somewhat lower than last year's.

Average salaries for new faculty increased by 7% for tenure-track and by 8% for non-tenure-track teaching faculty, similar to the overall increases for these categories. Average salaries for researchers and post-docs increased at much higher rates (39% and 30%, respectively), but the total numbers in these categories are too small to draw strong conclusions.

Concluding Observations

The continuing rise in bachelor's and master's students is creating a strong demand for faculty in computer science and engineering. On average, CS and CE departments want to grow by 21% over the next two years. Unfortunately, the production of new Ph.Ds is not rising to meet this demand. Even worse, historic demographics indicate that the fraction of graduating Ph.Ds who enter academia will decline as the proportion of Ph.D students who are nonresident aliens increases. Already many faculty positions are being filled by hiring faculty from other universities. This year 127 people made such a shift (Table 23), compared with 75 last year. We can expect more of this "poaching" as demand outstrips supply. This, plus greater competition for new graduates, will place upward pressure on junior faculty salaries and startup packages. Universities will need to look to sources beyond new Ph.Ds and existing faculty to meet their growth targets.

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Table 6. Ph.D. Degree Total Enrollment by Department Type and Rank

Department, Rank	CS		CE		CS & CE	
US CS 1-12	1,452	(20%)	0	(0%)	1,452	(18%)
US CS 13-24	1,180	(16%)	14	(3%)	1,194	(15%)
US CS 25-36	914	(12%)	0	(0%)	914	(12%)
US CS Other	3,359	(45%)	331	(74%)	3,690	(47%)
Canadian	505	(7%)	10	(2%)	515	(7%)
US CE	2	(0%)	90	(20%)	92	(1%)
Total	**7,412**		**445**		**7,857**	

Table 7. Gender of Ph.D. Program Total Enrollment

	CS		CE		CS & CE	
Male	5,882	(82%)	372	(84%)	6,254	(82%)
Female	1,319	(18%)	73	(16%)	1,392	(18%)
Total have Gender Data for	**7,201**		**445**		**7,646**	
Unknown	211		0			
Total	**7,412**		**445**		**7,857**	

Table 8. Ethnicity of Ph.D. Program Total Enrollment

	CS		CE		CS&CE	
Nonresident Alien	3,210	(49%)	299	(70%)	3,509	(50%)
African American, Non-Hispanic	110	(2%)	1	(0%)	111	(2%)
Native American or Alaskan Native	4	(0%)	0	(0%)	4	(0%)
Asian or Pacific Islander	657	(10%)	26	(6%)	683	(10%)
Hispanic	81	(1%)	3	(1%)	84	(1%)
White, Non-Hispanic	2,279	(35%)	79	(18%)	2,358	(34%)
Other/Not Listed	192	(3%)	20	(5%)	212	(3%)
Total have Ethnicity Data For	**6,533**		**428**		**6,961**	
Ethnicity/Residency Unknown	879		17		896	
Total	**7,412**		**445**		**7,857**	

Figure 4. B.S. Production

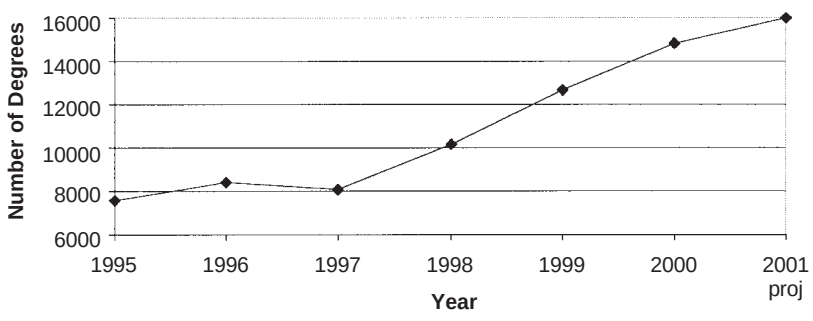

Figure 5. Newly Declared CS/CE Undergraduate Majors

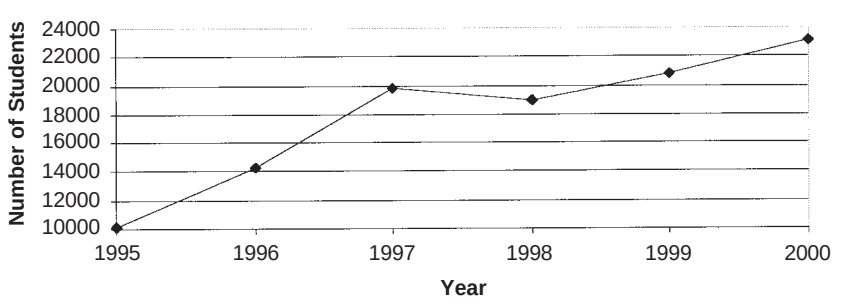

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Table 9. Gender of Bachelor's and Master's Recipients

	Bachelor's						Master's					
	CS		CE		CS & CE		CS		CE		CS & CE	
Male	9,267	(80%)	1,824	(88%)	11,091	(81%)	4,254	(74%)	337	(80%)	4,591	(74%)
Female	2,372	(20%)	258	(12%)	2,630	(19%)	1,507	(26%)	83	(20%)	1,590	(26%)
Total have Gender Data for	**11,639**		**2,082**		**13,721**		**5,761**		**420**		**6,181**	
Unknown	1,021		80		1,101		339		42		381	
Total	**12,660**		**2,162**		**14,822**		**6,100**		**462**		**6,562**	

Table 10. Ethnicity of Bachelor's and Master's Recipients

	Bachelor's						Master's					
	CS		CE		Total		CS		CE		Total	
Nonresident Alien	747	(9%)	101	(5%)	848	(8%)	2,668	(51%)	256	(63%)	2,924	(52%)
African American, Non-Hispanic	324	(4%)	72	(4%)	396	(4%)	104	(2%)	4	(1%)	108	(2%)
Native American or Alaskan Native	31	(0%)	4	(0%)	35	(0%)	74	(1%)	-	(0%)	74	(1%)
Asian or Pacific Islander	1,988	(23%)	319	(17%)	2,307	(22%)	906	(17%)	32	(8%)	938	(17%)
Hispanic	292	(3%)	74	(4%)	366	(3%)	59	(1%)	4	(1%)	63	(1%)
White, Non-Hispanic	4,744	(55%)	1,106	(59%)	5,850	(56%)	1,275	(24%)	100	(25%)	1,375	(24%)
Other/Not Listed	524	(6%)	210	(11%)	734	(7%)	170	(3%)	8	(2%)	178	(3%)
Total have Ethnicity Data For	**8,650**		**1,886**		**10,536**		**5,256**		**404**		**5,660**	
Ethnicity/Residency Unknown	4,010		276		4,286		844		58		902	
Total	**12,660**		**2,162**		**14,822**		**6,100**		**462**		**6,562**	

Table 11. Bachelor's Degree Candidates for 2000-2001 by Department Type and Rank

Department, Rank	CS		CE		CS & CE	
US CS 1-12	1,794	(13%)	75	(3%)	1,869	(12%)
US CS 13-24	1,286	(9%)	395	(18%)	1,681	(11%)
US CS 25-36	1,626	(12%)	63	(3%)	1,689	(11%)
US CS Other	6,429	(47%)	1,381	(61%)	7,810	(49%)
Canadian	2,572	(19%)	210	(9%)	2,782	(17%)
US CE	30	(0%)	127	(6%)	157	(1%)
Total	**13,737**		**2,251**		**15,988**	

Table 12. Master's Degree Candidates for 2000-2001 by Department Type and Rank

Department, Rank	CS		CE		CS & CE	
US CS 1-12	730	(12%)	0	(0%)	730	(12%)
US CS 13-24	565	(10%)	3	(1%)	568	(9%)
US CS 25-36	431	(7%)	0	(0%)	431	(7%)
US CS Other	3,773	(64%)	354	(84%)	4,127	(66%)
Canadian	381	(6%)	10	(2%)	391	(6%)
US CE	-	(0%)	53	(13%)	53	(1%)
Total	**5,880**		**420**		**6,300**	

Table 13. New Master's Students in Fall 2000 by Department Type and Rank

	CS		CE		CS & CE	
Department, Rank		Ave. per Dept.		Ave. per Dept.	Total	Ave. per Dept.
US CS 1-12	681	61.9	0	0.0	681	61.9
US CS 13-24	590	53.6	2	0.2	592	53.8
US CS 25-36	322	26.8	0	0.0	322	26.8
US CS Other	3,753	34.8	437	4.0	4,190	38.8
Canadian	565	29.7	15	0.8	580	30.5
US CE	0		38	7.6	38	7.6
Total	**5,911**	**36.7**	**492**	**3.0**	**6,403**	**38.6**

Table 14. New Undergraduate Students in Fall 2000 by Department Type and Rank

	CS			CE			CS & CE Majors	
Department, Rank	Pre-Major	Major	Average Major per Dept.	Pre-Major	Major	Average Major per Dept.	Total	Average Major per Dept.
US CS 1-12	750	1,504	136.7	0	65	5.9	1,569	142.6
US CS 13-24	182	1,440	120.0	0	426	35.5	1,866	155.5
US CS 25-36	717	1,816	151.3	26	58	4.8	1,874	156.2
US CS Other	4,171	11,198	103.7	0	2,027	18.8	13,225	122.5
Canadian	961	4,270	237.2	768	276	15.3	4,546	252.6
US CE	-	31	6.2	0	305	61.0	336	67.2
Total	**6,781**	**20,259**	**122.0**	**794**	**3,157**	**19.0**	**23,416**	**141.1**

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Rankings

For tables that group computer science departments by rank, the rankings are based on information collected in the 1995 assessment of research and doctorate programs in the United States conducted by the National Research Council.

The top twelve schools in this ranking are: Stanford, Massachusetts Institute of Technology, University of California at Berkeley, Carnegie Mellon, Cornell, Princeton, University of Texas at Austin, University of Illinois at Urbana-Champaign, University of Washington, University of Wisconsin at Madison, Harvard, and California Institute of Technology. All but one school in this ranking participated in the survey this year.

CS departments ranked 13-24 are: Brown, Yale, University of California at Los Angeles, University of Maryland at College Park, New York University, University of Massachusetts at Amherst, Rice, University of Southern California, University of Michigan, University of California at San Diego, Columbia, and University of Pennsylvania.[2] All schools in this ranking participated in the survey this year.

CS departments ranked 25-36 are: University of Chicago, Purdue, Rutgers, Duke, University of North Carolina at Chapel Hill, University of Rochester, State University of New York at Stony Brook, Georgia Institute of Technology, University of Arizona, University of California at Irvine, University of Virginia, and Indiana. All schools in this ranking participated in the survey this year.

CS departments that are ranked above 36 or are unranked that responded to the survey include: Arizona State, Auburn, Boston, Brandeis, Brigham Young, Case Western Reserve, City University of New York, Clemson, William and Mary, Colorado School of Mines, Colorado State, Dartmouth, DePaul, Drexel, Florida Atlantic, Florida Institute of Technology, Florida International, Florida State, George Mason, George Washington, Iowa State, Johns Hopkins, Kansas State, Kent State, Lehigh, Louisiana State, Michigan State, Michigan Technological, Mississippi State, New Jersey Institute of Technology, New Mexico State University, New Mexico Tech, North Carolina State, North Dakota State, Northeastern, Nova Southeastern, Oakland, Ohio State, Oklahoma State, Old Dominion, Oregon Graduate Institute, Oregon State, Pennsylvania State, Polytechnic, Portland State, Rensselaer Polytechnic Institute, Southern Methodist, State University of New York (Albany and Buffalo), Stevens Institute, Syracuse, Temple, Texas A&M, Texas Tech, Tufts, Tulane, Washington State, and Washington (St. Louis). University of: Alabama (Birmingham, Huntsville, and Tuscaloosa), Arkansas, California (Davis, Riverside, Santa Barbara, and Santa Cruz), Central Florida, Cincinnati, Colorado (Boulder and Colorado Springs), Georgia, Illinois (Chicago), Louisiana (Lafayette), Maryland (Baltimore Co.), Massachusetts (Lowell), Missouri (Rolla and Columbia), Nebraska (Lincoln), Nevada (Las Vegas), Notre Dame, South Florida, Tennessee (Knoxville), Texas (Arlington, Dallas, and El Paso), Wisconsin (Milwaukee), Connecticut, Delaware, Denver, Florida, Hawaii, Houston, Idaho, Iowa, Kansas, Kentucky, Minnesota, Mississippi, New Hampshire, New Mexico, North

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Table 15. Master's Degree Total Enrollment by Department Type and Rank

Department, Rank	CS		CE	CS & CE
US CS 1-12	1,279	(8%)	0	1,279
US CS 13-24	1,198	(8%)	12	1,210
US CS 25-36	581	(4%)	0	581
US CS Other	10,880	(70%)	1,009	11,889
Canadian	1,669	(11%)	30	1,699
US CE	-	(0%)	79	79
Total	**15,607**		**1,130**	**16,737**

Table 16. Bachelor's Degree Program Total Enrollment by Department Type and Rank

	CS			CE			CS & CE Majors	
Department, Rank	Pre-Major	Major	Average Major per Dept.	Pre-Major	Major	Average Major per Dept.	Total	Average Major per Dept.
US CS 1-12	107	6,716	610.5	0	151	13.7	6,867	624.3
US CS 13-24	333	5,686	473.8	41	1,569	130.8	7,255	604.6
US CS 25-36	1,912	5,659	471.6	0	112	9.3	5,771	480.9
US CS Other	8,905	38,170	353.4	1,270	8,359	77.4	46,529	430.8
Canadian	1,364	10,431	579.5	0	1,454	80.8	11,885	660.3
US CE	0	118	23.6	168	886	177.2	1,004	200.8
Total	**12,621**	**66,780**	**402.3**	**1,479**	**12,531**	**72.9**	**79,311**	**477.8**

Table 17. Actual and Anticipated Faculty Sizes by Position

	Actual	Projected			
	2000-2001	2001-2002	2002-2003	Expected Two-Year Growth	
Tenure-Track	3,591	3,989	4,366	775	(22%)
Researcher	345	347	348	3	(1%)
Postdoc	208	263	316	108	(52%)
Teaching Faculty	643	704	761	118	(18%)
Other/Not Listed	152	162	175	23	(15%)
Total	**4,939**	**5,465**	**5,966**	**1,027**	**21%**

Table 18. Actual and Anticipated Faculty Sizes by Department Type and Rank

	Actual	Projected			
Department Rank	2000-2001	2001-2002	2002-2003	Expected Two-Year Growth	
US CS 1-12	684	742	760	76	(11%)
US CS 13-24	479	516	564	85	(18%)
US CS 25-36	402	431	488	86	(21%)
US CS Other	2,587	2,876	3,161	574	(22%)
Canadian	677	777	859	182	(27%)
US CE	110	123	134	24	(22%)
Total	**4,939**	**5,465**	**5,966**	**1,027**	**(21%)**

1999-2000 Taulbee Survey

Table 19. Gender of Newly Hired Faculty

	Tenure-Track		Researcher		Postdoc		Teaching Faculty		Other		Total	
Male	300	(88%)	43	(93%)	63	(84%)	122	(74%)	10	(83%)	538	(84%)
Female	39	(12%)	3	(7%)	12	(16%)	43	(26%)	2	(17%)	99	(16%)
Total	**339**	**(53%)**	**46**	**(7%)**	**75**	**(12%)**	**165**	**(26%)**	**12**	**(2%)**	**637**	
Unknown	2		0		0		1		0		640	

Table 20. Ethnicity of Newly Hired Faculty

	Tenure-Track		Researcher		Postdoc		Teaching Faculty		Other		Total
Nonresident Alien	54	(17%)	7	(15%)	34	(50%)	11	(7%)	3	(25%)	109
African American, Non-Hispanic	2	(1%)	0	(0%)	0	(0%)	4	(2%)	0	(0%)	6
Native American or Alaskan Native	0	(0%)	0	(0%)	0	(0%)	1	(1%)	0	(0%)	1
Asian or Pacific Islander	59	(19%)	6	(13%)	4	(6%)	14	(9%)	0	(0%)	83
Hispanic	6	(2%)	0	(0%)	0	(0%)	6	(4%)	0	(0%)	12
White, Non-Hispanic	182	(58%)	32	(70%)	26	(38%)	125	(78%)	9	(75%)	374
Other/Not Listed	9	(3%)	1	(2%)	4	(6%)	0	(0%)	0	(0%)	14
Total have Ethnicity Data For	**312**		**46**		**68**		**161**		**12**		**599**
Ethnicity/Residency Unknown	29		0		7		5		0		41
Total	**341**		**46**		**75**		**166**		**12**		**640**

Table 21. Gender of Current Faculty

	Full		Associate		Assistant		Teaching Faculty		Total	
Male	1,470	(92%)	1,009	(87%)	781	(86%)	531	(74%)	3,791	(87%)
Female	125	(8%)	148	(13%)	123	(14%)	190	(26%)	586	(13%)
Total have Gender Data for	**1,595**	**(36%)**	**1,157**	**(26%)**	**904**	**(21%)**	**721**	**(16%)**	**4,377**	

Table 22. Ethnicity of Current Faculty

	Full		Associate		Assistant		Teaching Faculty		Total	
Nonresident Alien	11	(1%)	18	(2%)	125	(15%)	35	(5%)	189	(5%)
African American, Non-Hispanic	4	(0%)	4	(0%)	9	(1%)	11	(2%)	28	(1%)
Native American or Alaskan Native	0	(0%)	0	(0%)	1	(0%)	2	(0%)	3	(0%)
Asian or Pacific Islander	266	(18%)	246	(23%)	149	(18%)	43	(6%)	704	(17%)
Hispanic	36	(2%)	20	(2%)	23	(3%)	8	(1%)	87	(2%)
White, Non-Hispanic	1,143	(77%)	753	(71%)	521	(62%)	574	(84%)	2,991	(73%)
Other/Not Listed	28	(2%)	26	(2%)	18	(2%)	13	(2%)	85	(2%)
Total have Ethnicity Data For	**1,488**		**1,067**		**846**		**686**		**4,087**	
Ethnicity/Residency Unknown	121		96		63		36		316	
Total	**1,609**		**1,163**		**909**		**722**		**4,403**	

Taulbee from Page 9

Texas, Oklahoma, Oregon, Pittsburgh, South Carolina, Utah, Wyoming, Vanderbilt, Virginia Polytechnic, Wayne State, West Virginia, Western Michigan, Worcester Polytechnic, and Wright State.

Computer Engineering departments participating in the survey this year include: Carnegie Mellon, Northwestern, Ohio State, Oregon State, Rensselaer Polytechnic, and University of New Mexico.

Canadian departments participating in the survey include: Concordia, Dalhousie, McGill, Memorial, Queen's, Simon Fraser, and York. University of: Alberta, British Columbia, Calgary, Montreal, Quebec (Montreal), Regina, Saskatchewan, Toronto CS, Toronto ECE, Victoria, Waterloo, and Western Ontario.

Acknowledgments

Jean Smith, Jay Vegso, and Bill Aspray assisted with the data collection, tabulation, and analysis for this survey. Stu Zweben provided valuable review comments and suggestions. We thank them for their assistance.

Endnotes

[1]The title of the survey honors the late Orrin E. Taulbee of the University of Pittsburgh who conducted these surveys for the Computer Science Board until 1984, with retrospective annual data going back to 1970.

[2]Although the University of Pennsylvania and the University of Chicago were tied in the National Research Council rankings, CRA made the arbitrary decision to place Pennsylvania in the second tier of schools.

Table 23. Faculty Losses

	Total
Died	4
Retired	54
Took Academic Position Elsewhere	127
Took Nonacademic Position	57
Remained, Changed to Part Time	15
Other	13
Unknown	5
Total	**275**

All tables with rankings: Statistics sometimes are given according to departmental rank. Schools are ranked only if they offer a CS degree and according to the quality of their CS program as determined by reputation. Those that only offer CE degrees are not ranked, and statistics are given on a separate line, apart from the rankings.

All ethnicity tables: Ethnic breakdowns are drawn from guidelines set forth by the U.S. Department of Education.

All faculty tables: The survey makes no distinction between faculty specializing in CS versus CE programs. Every effort is made to minimize the inclusion of faculty in electrical engineering who are not computer engineers.

Taulbee Continued on Page 11

1999-2000 Taulbee Survey

Table 24. Nine-month Salaries, 142 Responses of 163 US CS Computer Science Departments

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	581	$18,000	$45,202	$95,604	$51,909	$31,500	$60,157	$110,000
Assistant	762	$29,997	$64,895	$77,000	$68,628	$48,284	$72,464	$97,000
Associate	923	$42,616	$70,340	$98,000	$76,997	$64,949	$85,355	$150,000
Full	1,269	$48,000	$81,029	$108,300	$99,690	$79,100	$129,367	$253,485

Table 25. Nine-month Salaries, 11 Responses of 12 US CS Computer Science Departments Ranked 1-12

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	99	$35,856	$58,287	$95,604	$68,407	$59,800	$82,512	$108,000
Assistant	104	$46,800	$69,737	$75,006	$75,121	$72,300	$80,268	$90,800
Associate	81	$68,560	$78,077	$98,000	$83,746	$76,400	$89,083	$98,000
Full	216	$48,000	$83,683	$95,000	$112,910	$134,000	$162,626	$203,000

Table 26. Nine-month Salaries, 12 Responses of 12 US Computer Science Departments Ranked 13-24

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	53	$41,400	$56,797	$68,200	$62,252	$60,000	$69,021	$80,000
Assistant	68	$66,200	$70,693	$77,000	$75,015	$73,332	$80,850	$97,000
Associate	63	$61,520	$77,884	$88,000	$83,599	$75,200	$90,254	$105,300
Full	183	$69,103	$84,306	$108,300	$115,597	$143,000	$166,476	$253,485

Table 27. Nine-month Salaries, 12 Responses of 12 US Computer Science Departments Ranked 25-36

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	46	$36,000	$51,081	$71,080	$59,308	$46,350	$69,076	$110,000
Assistant	76	$61,000	$67,619	$73,250	$70,929	$61,000	$73,918	$83,243
Associate	83	$61,427	$74,571	$86,803	$82,481	$81,370	$95,194	$135,625
Full	140	$67,574	$85,902	$98,000	$109,100	$105,000	$149,142	$186,150

Table 28. Nine-month Salaries, 107 Responses of 127 US Computer Science Departments Ranked Higher than 36 or Unranked

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	383	$18,000	$41,579	$85,835	$47,853	$31,500	$55,433	$100,000
Assistant	514	$29,997	$63,371	$76,844	$66,906	$48,284	$70,464	$88,200
Associate	696	$42,616	$68,336	$88,750	$75,062	$64,949	$83,446	$150,000
Full	730	$52,898	$79,808	$102,147	$95,371	$79,100	$119,286	$199,027

Table 29. Twelve-month Salaries, 19 Responses of 23 Canadian Computer Science Departments (Canadian Dollars)

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Non-Tenure Teaching Faculty	52	$34,200	$48,704	$71,467	$53,162	$39,008	$60,633	$95,600
Assistant	128	$47,892	$64,421	$88,489	$70,056	$52,980	$76,758	$123,718
Associate	193	$55,000	$68,858	$92,970	$82,874	$74,604	$97,668	$150,000
Full	256	$48,400	$79,623	$108,803	$98,844	$80,964	$123,079	$176,000

Table 30. Nine-month Salaries for New Ph.Ds, Responding US CS and CE Departments

Faculty Rank	Number of Faculty	Reported Salary Minimum			Average of all Salaries	Reported Salary Maximum		
		Minimum	Mean	Maximum		Minimum	Mean	Maximum
Tenure-Track	95	$45,000	$68,378	$80,000	$68,915	$45,000	$69,439	$80,000
Researcher	3	$69,000	$79,945	$85,835	$79,945	$69,000	$79,945	$85,835
Non-Tenure Teaching Faculty	9	$42,000	$54,908	$70,000	$54,908	$42,000	$54,908	$70,000
Postdoc	18	$30,000	$45,637	$70,000	$48,001	$30,360	$51,637	$70,000

Microsoft Research from Page 1

for additional research on the technology, tools, and processes for software development to improve the quality of software and the productivity of programmers. This group is now a major focus of our work. Tools from this group have been deployed throughout the company and are being used routinely by the major development groups.

Recently, Microsoft announced a new strategic direction called .NET, which combines several exciting directions. First it envisions a new generation of the Web, turning it into a distributed programming environment. Websites and web servers will no longer just provide data to a browser, but will provide services to distributed applications via XML. .NET also emphasizes new application areas, including rich support for communities, communications, and collaboration. Finally .NET involves providing access to services and information from a whole range of devices, from the PC and PDAs to game devices and cellular phones.

MSR was involved in defining .NET and providing important technology in several areas such as communications and collaboration. Eric Horvitz, one of our senior researchers in the Adaptive Systems and Interaction group, has been particularly interested in building intelligent systems that acknowledge the scarcity of human attention. All of us suffer from information overload from a variety of communications and information sources, such as e-mail, voicemail, and computer-generated notifications. If the system models the urgency and importance of the notification as well as the context of the user (is the user busy, on the road, in a meeting, etc.), the system could intelligently prioritize notifications and choose the delivery mechanism—instant messaging, e-mail, or cellular phone, for example.

We are also working on understanding how to improve telepresentations, and perhaps make them even superior to live lectures. The ability to provide effective distance learning, offered any time and any place, is clearly of great interest to educators. We would like to transmit presentations to a remote audience while still engaging the audience, and give the remote audience the ability to participate with each other and the lecturer. We are also working on capturing the presentation for later viewing, but having it behave as a living document that continues to evolve via annotations posted by all the viewers. To determine the effectiveness of a variety of techniques, we have deployed prototype software for internal Microsoft training programs.

Another researcher, Marc Smith, is a sociologist who is studying what he calls "social cyberspace." He defines this as the place where people interact. He is trying to understand the social protocols in online communities, and how social mechanisms can be supported with technology in order to create an effective and self-sustaining cyber-community.

In addition to contributing to Microsoft, another important goal for MSR is to be an active participant in the international research community. To this end, our researchers are encouraged to serve as editors of journals, to serve on national and international panels and advisory boards, to work on conference program committees, and to give talks throughout the world. We also work closely with the university community. One of our researchers, David Salesin, serves as an adjunct faculty member in computer graphics at the University of Washington where he teaches and supervises students. He has done landmark work in the area of non-photorealistic rendering, including his computer-generated pen-and-ink illustrations and computer-generated watercolors. David received SIGGRAPH's Computer Graphics Achievement Award last year.

We have also worked with other research centers and universities on a project called the Multi University Research Laboratory (MURL—http://murl.microsoft.com). This is a publicly accessible website that features computer science lectures on demand. These lectures were captured and contributed by each of the partner institutions: Carnegie Mellon University, the Massachusetts Institute of Technology, Stanford University, the University of Washington, Microsoft Research, and the Xerox Palo Alto Research Center.

Microsoft gave us a unique opportunity to create a new computer science research lab from the ground up. Given this opportunity, we focused on attracting outstanding people, creating an open and collaborative research environment with a research agenda driven by the researchers, and providing them with the opportunity to improve the lives of millions of people through Microsoft products. This has proved to be an incredibly exciting and stimulating combination.

Daniel Ling is vice-president of Microsoft Research Redmond at Microsoft Corp. He was one of the founders of the Redmond laboratory, and served as its Director from 1995 to 2000. Dan Ling holds a B.S., M.S. and Ph.D. in Electrical Engineering from Stanford University. Microsoft Research is a sponsor of CRA's Outstanding Undergraduate Awards program. ∎

COMPUTING RESEARCH NEWS

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CRA Careers Workshop a Big Success

More than 70 people attended CRA's Academic Careers and Effective Teaching Workshop in Arlington, Virginia in February. Pictured above (right of the screen) is board member and speaker Bill Woods (Sun Microsystems Labs); in front of the podium is board member and workshop organizer Bobby Schnabel (University of Colorado at Boulder).

Transitions and Announcements

James Foley has been appointed an Associate Dean of the College of Computing at Georgia Tech. In his new position he will focus on a variety of faculty affairs including research development, continuing education, mentoring, distance education, and liaison with other departments and industry. Most recently, Professor Foley was the executive director of the Yamacraw Mission in Atlanta, and prior to that served as chairman and CEO of Mitsubishi Electric Research in Cambridge, Mass. Professor Foley is CRA's treasurer and chair-elect.

Kathleen McKeown, Chair of Computer Science at Columbia University, was named Outstanding Woman Scientist by the Association for Women in Science, New York (2000). Professor McKeown is a board member and secretary-elect of CRA.

The National Academy of Sciences Award for Initiatives in Research, awarded this year in the field of computational science and applied mathematics, has been given to Jon M. Kleinberg, Assistant Professor of Computer Science at Cornell University. This award recognizes innovative young scientists and encourages research likely to lead toward new capabilities for human benefit.

Eugene 'Spaf' Spafford, Professor of Computer Sciences at Purdue University, has been elected an IEEE Fellow. 'Spaf' is an ACM representative on CRA's board of directors.

Jack Stankovic, chair of computer science at the University of Virginia, has received the IEEE Real-Time Systems Technical Committee 2000 Award for outstanding technical contributions and leadership. Professor Stankovic is a board member and treasurer-elect of CRA. ∎

Professional Opportunities

CRN Advertising Policy

See http://www.cra.org/main/cra.jobshow.html

Arizona State University

Faculty Positions in Bioengineering

The Bioengineering Program at Arizona State University seeks outstanding individuals who are eager to collaborate in a multidisciplinary environment in the area of Biological Micro Electro-Mechanical Systems (i.e. Bio-MEMS) for a tenure-track faculty position at ANY RANK. Applicants for the Bio-MEMS faculty positions must have expertise in the area of interest of Bio-MEMS (i.e. the sub-discipline of Bioengineering including application of engineering principles and methods in the creation of electro-mechanical systems with biological components and/or biomedical applications). Particular attention will be given to candidates with an interest in the development of devices and technologies that interface with the nervous, cardiovascular, and/or immune systems. For complete information on these faculty openings including detailed application procedures please contact

Dr. Antonio Garcia
The Department of Bioengineering
Box 879709
Arizona State University
Tempe, Arizona, 85287-9709
tony.garcia@asu.edu
(480) 965-8798

ASU is an Equal Opportunity / Affirmative Action Employer.

Auburn University

Department of Computer Science and Software Engineering

Faculty Positions and Director of Institute

The Department of Computer Science and Software Engineering invites applications for multiple tenure-track faculty positions and Director of the Institute for Reconfigurable Smart Components (IRSC). IRSC, which is a joint effort with the Department of Electrical and Computer Engineering, will focus on (1) creation of enabling technology for reconfigurable smart components, and the transfer of the technology, as appropriate, to industry; and (2) enhancement of the graduate research programs in the College of Engineering. The University will invest over $1M (estimated) in five years in new positions with an objective of gaining national prominence in the area over this time period.

Successful applicants may start in January or August 2001. Responsibilities include research, graduate student supervision, and graduate and undergraduate teaching. Applicants must have a Ph.D. in computer science, software engineering, or a closely related field. We are particularly interested in candidates with research interests related to IRSC in the areas of computer and communication networks, security, real-time and embedded systems, wearable computing, operating systems and software engineering; however, all areas of computer science and software engineering will be considered. Appointments will be made at the Assistant, Associate, or full Professor level commensurate with the candidate's qualifications.

Director of IRSC (12 month) - The successful candidate will have demonstrated excellence in leading a research effort in the information technology area and developing partnerships with government and industry. The candidate must qualify for appointment at the rank of Professor with tenure in the CSSE Department. The Director will report to the Dean of Engineering on matters related to the Institute. The Director will coordinate and manage the research effort and will provide much of the vision and direction for the Institute.

The CSSE Department currently has 13 full-time faculty members and supports strong undergraduate (B.S., B.Sw.E.) and graduate programs (M.S., M.Sw.E., Ph.D.). Faculty research areas include software engineering, computer and communication networks, human-computer interaction, wearable computing, artificial intelligence, and database systems. More information about the Department and faculty research interests can be obtained from the Department's home page (http://www.eng.auburn.edu/csse).

Auburn University was chartered in 1856, and is the largest university in the state of Alabama, with a student enrollment of over 22,000 and 1,125 faculty. Auburn is located 100 miles southwest of Atlanta and 50 miles northeast of Montgomery, the State Capitol. Auburn is ranked 38th overall and 34th in Engineering among public universities by U. S. News and World Report. Auburn offers nearly 150 baccalaureate degree programs in 64 academic departments. The graduate school provides master's level programs in 130 areas and doctoral programs in 96 fields. The College of Engineering has an enrollment of 3,100 undergraduates and 500 graduate students in 8 departments. The picturesque main campus covers 1,875 acres, and includes the entire southwest quadrant of the city of Auburn. The Auburn-Opelika community has a population of about 70,000, an excellent public school system, and has been nationally ranked as one of the "best small towns in America".

Applicants should submit a current curriculum vita, research vision, teaching philosophy and 5 references to:

Dr. John M. Owens, Chair
CSSE Search Committee
College of Engineering
108 Ramsay Hall
Auburn University, AL 36849
www.eng.auburn.edu/irsc/

The interview process will begin November 1, 2000 and continue until candidates are selected and recommended for appointment.

AA/EEOE/Women and Minorities are encouraged to apply.

Ball State University

Department of Computer Science

The Department of Computer Science seeks an applicant for a full-time, tenure track faculty position available August 17, 2001. Rank open. Responsibilities: desire and interest to teach all undergraduate and master's level graduate courses with a special background in one or more of the following areas— database, programming languages, computer networks, and software engineering; must be able to teach CS1 and CS2. An active, productive research program is required for tenure and promotion. Minimum qualification: doctorate in computer science or closely related field by August 1, 2001. Preferred qualifications: Ph.D. in computer science; record of scholarly research; teaching experience.

Ball State University has approximately 17,500 students. The Department of Computer Science has approximately 200 undergraduate majors and 100 M.S. students. Departmental lab facilities include both Microsoft Windows-based machines and Unix-based machines. For more information, visit web pages at www.bsu.edu and www.cs.bsu.edu.

Send letter of application; vita; and the names, addresses, and telephone numbers of three references to:

Dr. Frank Owens
Computer Science Search Committee
Department of Computer Science
Ball State University
Muncie, IN 47306

Review of completed applications will begin immediately and will continue until the position is filled.

Ball State University is an equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

Brooklyn College

The City University of New York (CUNY)

The Department of Computer and Information Science (CIS) at Brooklyn College, in conjunction with the Doctoral Program in Computer Science at the CUNY Graduate Center, is seeking a distinguished Professor of Computer Science, specializing in the area of Software. We are an urban liberal arts college, and our department has 23 full-time faculty, over 700 undergraduate majors, over 300 Master's students and over 20 affiliated doctoral students of the CUNY Graduate Center. Several major research projects are currently underway. Extensive faculty and student SUN/UNIX and PC networks are used in teaching and research.

A successful candidate will teach undergraduate and/or graduate courses in CIS, mentor doctoral students, and continue a distinguished research program in a field directly related to Software. He or she should have a broad knowledge of computer science and should have good teaching skills. A preferred candidate should also have a record of participation in research grants and high-quality research in the field.

Please send a CV and three letters of reference to:

Aaron Tenenbaum
Dept. of CIS
Brooklyn College
2900 Bedford Avenue
Brooklyn, NY 11210
(tbaum@sci.brooklyn.cuny.edu).

Review of applications will begin April 15 and will continue until positions are filled.

EOE/AA/IRCA/ADA

Carnegie Mellon University

Computation Molecular Biology

The Department of Biological Sciences at Carnegie Mellon University seeks to fill a tenure-track appointment at the intersection of computer science and biology. Successful candidates will have strong credentials in both areas, a doctoral degree in computer science or a natural science, and be prepared to take advantage of Carnegie Mellon's world-class strength in Computer Science and strong tradition of interdisciplinary research. Applicants in all areas will be considered; protein and RNA structure and function are of particular interest. Send curriculum vitae, statement of research interests, and three letters of recommendation to

Dr. Robert F. Murphy
Department of Biological Sciences
Carnegie Mellon University
4400 Fifth Avenue
Pittsburgh, PA 15213

Review of applications will continue until a suitable candidate is recruited. Our department is eager to diversify its faculty; we encourage women and minorities to apply. Carnegie Mellon University is an Equal Opportunity/Affirmative Action Employer.

Dalhousie University

Faculty Positions in Computer Science

Dalhousie University (http://www.dal.ca) invites applications for tenure track and contractually limited positions at all levels within the Faculty of Computer Science (http://www.cs.dal.ca) which currently has 23 faculty members, approximately 600 undergraduate majors and 150 master's and doctoral students. The Faculty recently moved to a new, dedicated building, and initiatives are under development involving multidisciplinary research projects with university and industrial partners. For example, a Master of Electronic Commerce (http://www.ecomm.dal.ca) degree is now offered in collaboration with the Faculties of Law and Business. Further expansion of Computer Science is a priority for the University.

Dalhousie University is located in Halifax, Nova Scotia (http://www.region.halifax.ns.ca/), which is the largest city in Atlantic Canada (http://explore.gov.ns.ca/Images/How.jpg) and affords its residents outstanding quality of life.

The Faculty pursues a strong research program in the following areas: Software Engineering and Applications, Data Collection, Storage and Analysis, Communications and Networks, Theory and Algorithms, Network & New Media Applications. Application areas include electronic commerce and computers in medicine. The opportunity exists for faculty members to participate in industrially sponsored research through the Global Information Networking Institute (GINI) (http://www.gini.dal.ca/).

The Faculty is interested in outstanding candidates from all areas of computer science; however, preference will be given to candidates interested in network centric computing, software engineering, and related areas, such as networking, HCI, or distributed applications. Successful candidates will be encouraged to establish connections with industry.

An applicant should have a PhD in Computer Science, although a PhD in a related area may be considered. Evidence of strong commitment to and aptitude for research and teaching is essential. Rank and salary will be commensurate with qualifications.

Applications should include a curriculum vitae, the names and complete addresses of three references, and a completed CV Summary (http://www.cs.dal.ca/~pcox/Search/CV.pdf) and should be sent to the address below. Applicants should also supply their referees with the document Information for Referees (http://www.cs.dal.ca/~pcox/Search/Ref-Info.pdf), and arrange for them to forward letters of reference directly to the same address.

The Chair, Appointments Committee
Faculty of Computer Science
6050 University Avenue
Dalhousie University
Halifax, NS Canada, B3H 1W5
E-mail: appointments@cs.dal.ca

Applications will be accepted until all available positions are filled. In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. Dalhousie University is an Employment Equity/Affirmative Action Employer. The University encourages applications from qualified Aboriginal peoples, persons with a disability, racially visible persons and women.

Harvey Mudd College

Computer Science Department

Assistant Professor Position (http://www.cs.hmc.edu)

The Computer Science Department of Harvey Mudd College intends to appoint a tenure-track Assistant Professor of Computer Science, to start 1 July 2001 (classes begin about 1 September). We are most interested in applicants with strengths in one or more of the following areas: software architecture, distributed systems, networking, and databases, although strong candidates in other areas will also be considered. Applicants for one-year visiting appointments or partial appointments (such as sabbatical visitors) will also be considered.

The successful candidate will have completed the PhD in Computer Science by the time of appointment, and is expected to devote attention to excellence in teaching, as well as to the development of a research program involving undergraduates.

Harvey Mudd College is a highly-selective undergraduate college (680 students) emphasizing science, mathematics, and engineering. It is a member of the geographically-contiguous Claremont Consortium in Southern California, which collectively provides the equivalent of a small university environment in a pleasant residential community.

The Computer Science Department is well-equipped and offers a wide array of courses in both foundations and advanced topics in computer science. Qualified students engage in research and publication with faculty members. The department's Computer Science Clinic provides a strong link to the industrial community in the form of year-long student projects.

Applicants should respond with a curriculum vitae, a statement regarding teaching and research philosophy or plan, and supporting materials such as reprints. Concurrently, please ask three references to write to us directly. Email applications and reference letters are acceptable: keller@cs.hmc.edu.

Professor Robert M. Keller, Chair
Computer Science Department Harvey Mudd College 301 E. Twelfth Street Claremont, CA 91711.

Applications will be reviewed until the position is filled.

Harvey Mudd College is an Equal Opportunity Employer. Applications from members of groups typically underrepresented in computer science faculties are strongly encouraged.

Indiana University

Computer Science Department

Faculty Positions

The Indiana University Computer Science Department anticipates filling several tenure-track faculty positions beginning 2001-2002. Areas of interest are operating systems,

(continued)

CLARKE COLLEGE
DUBUQUE, IOWA

Computer Science

Clarke College, a growing, Catholic, coeducational, liberal arts college is seeking candidates for a full-time faculty position in the Computer Science Department. This is a tenure track position beginning in August 2001. Applicants should have a Ph.D. in Computer Science, Information Systems, or a closely related field (ABD will be considered). Enthusiasm for teaching a wide range of computer science and information systems classes to undergraduates is essential; additional experience establishing and teaching in a graduate CIS program is desirable. Located within the scenic tri-state area of NE Iowa, SW Wisconsin, and NW Illinois, Dubuque offers a great quality of life and is within driving proximity to Chicago, Madison, and the Twin Cities. Visit Clarke's web site at: www.clarke.edu. Please contact Sheila Castaneda with questions at: Phone (319) 588-6401, Fax (319) 588-6789, e-mail: cast@keller.clarke.edu. Applicants should send a letter of application addressing teaching philosophy and experience and a current CV/resume to: Human Resources, Clarke College, 1550 Clarke Dr., Dubuque, IA 52001. Clarke is an Equal Opportunity Employer

Professional Opportunities

distributed systems, networking, graphics and databases. In addition our new, privately endowed, IPCRES research center will be hiring several senior positions in the areas of distributed systems, networking, pervasive computing, security and graphics.

The CS department, which is part of the College of Arts and Sciences, is working cooperatively with our new School of Informatics, which offers a B.S. degree focusing on the application of information technology to various disciplines and has M.S. programs in Human Computer Interaction, and Bio and Chemical Informatics. Cross-appointments with Informatics are possible in computer science related areas such as data mining and search technologies.

A Ph.D. in Computer Science is required for all CS faculty positions. Applicants must have demonstrated potential for excellence and productivity in research. In addition, a strong contribution to the educational mission of the department is expected.

The department occupies a spacious limestone building with extensive state-of-the-art computing facilities. The attractive wooded campus of Indiana University is located in Bloomington, chosen as one of the most cultural and livable small cities in the US, and only one hour from the Indianapolis airport. To learn more about the department please visit our web site at www.cs.indiana.edu.

Please send a detailed CV and a list of references to:

Faculty Search
Computer Science Department
Indiana University
Lindley Hall 215
Bloomington, IN 47405-7104
email: search@cs.indiana.edu

Indiana University is an Equal Opportunity/Affirmative Action Employer. The Computer Science Department strongly encourages applications from women and minorities.

Kent State University

Department of Computer Science

Multiple tenure-track positions

Multiple tenure-track positions in Computer Science at the Assistant and Associate Professor are available in the Department of Mathematics and Computer Science at Kent State University. The principal areas of interest for these positions are: Graphics and Scientific Visualization, Database Systems, Networking and Computational Science. The exact number of open positions has not been determined and will depend on the availability of funding.

In addition, subject to funding approval, two tenure-track positions at the Associate and Full Professor levels, with responsibilities for industrial outreach and with responsibility for interdisciplinary outreach respectively, are available. The principal areas of interest for these positions are: Graphics and Scientific Visualization; Database Systems; Computational Science; Massively Parallel and Distributed Computation; Networking; Operating Systems; Artificial Intelligence; and Image processing. Individuals with experience in cooperative, computer science-industrial programs or with experience in interdisciplinary computer science programs are encouraged to apply.

The department offers B.S., M.A., M.S. and Ph.D. degrees in computer science. The computer science program has 15 faculty, over 150 graduate students and over 350 undergraduate students, and is experiencing growth in student numbers. In addition, the computer science program has been targeted for significant enhancement by both the State of Ohio and Kent State University.

Application letters together with a resume and the names of three references should be sent to:

Computer Science Search Committee
Department of Mathematics and Computer Science
Kent State University
Kent, Ohio 44242, USA
FAX (330)-672-7824

Nominations and applications may also be submitted via email to cs-pos@mcs.kent.edu (in ASCII or PostScript format.)

The search committee will begin to consider applications on January 2, 2001 and will continue until the position is filled. Visit the Kent State Computer Science website at http://www.cs.kent.edu for additional information about the program.

Kent State University is an Affirmative Action/Equal Opportunity Employer.

Kent State University

Department of Computer Science

Distinguished Professor of Computer Science

Applications and nominations are invited for the position of Distinguished Professor of Computer Science. Outstanding candidates in all areas will be considered, but our principal areas of interest are parallel and distributed computation and networking. This position, which resulted from an initiative by the Ohio Board of Regents to strengthen Ph.D. computer science programs in Ohio, is intended to enhance the quality and visibility of research activities in the department as well as to promote collaboration between the computer science doctoral programs in Ohio and with industry. In addition to startup funds, the position includes ongoing research funding. A successful candidate will be expected to interact effectively with existing faculty and to help in shaping the future research directions of the department and the state.

The department offers B.S., M.A., M.S. and Ph.D. degrees in computer science. The computer science program has 15 faculty, over 150 graduate students and over 350 undergraduate students, and is experiencing strong growth in student numbers. In broad terms, the faculty areas of research lie in massively parallel and distributed computation; numerical and scientific computation, modeling, and visualization; symbolic computation; networking and distributed operating systems; artificial intelligence; and image processing. The department has been targeted for significant enhancement by the State of Ohio and Kent State University, and will be increasing its equipment holdings and staff considerably in the near future.

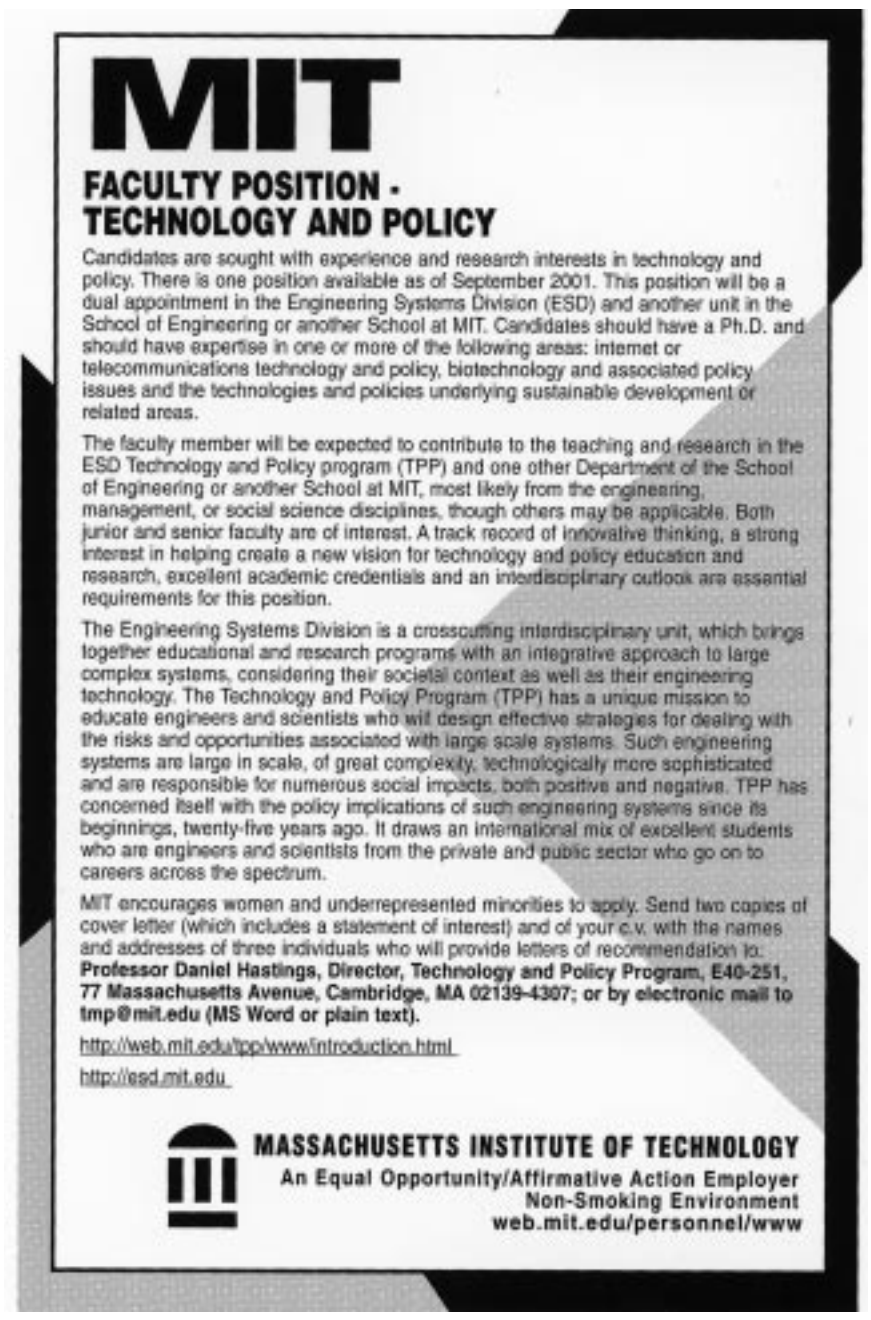
Letters of nomination or application letters together with a resume and the names of five references should be sent to:

Distinguished Chair in Computer Science
Search Committee
Department of Mathematics and Computer Science
Kent State University
Kent, Ohio 44242, USA
FAX (330)-672-7824

Nominations and applications may also be submitted via email to distinguished@mcs.kent.edu (in ASCII or PostScript format.)

The search committee will begin to consider applications immediately and will continue until the position is filled. Visit the KSU Computer Science website at http://www.cs.kent.edu for additional information about the program.

Kent State University is an Affirmative Action/Equal Opportunity Employer.



Lehigh University

Tenure-Track positions in Computer Science and Computer Engineering

Lehigh University is seeking applicants at all levels for tenure track positions in Computer Science and Computer Engineering. Exceptional applicants with a doctorate (by September of 2001) in any area of Computer Science or Computer Engineering are sought with preferences in distributed systems, networking, theory, compilers, digital or embedded systems, and computer architecture. Applicants must have a proven record of innovative research and be committed to teaching.

Lehigh University has announced a $75 million program to strengthen its academic core, and computer and information sciences are key among intended areas for investments. While detailed plans are being developed this year, this is expected to translate into very significant growth in the next 3-5 years, with new initiatives to commence in Spring 2001. Lehigh is a top 40 ranked national university with quality graduate and undergraduate programs in Computer Science and Computer Engineering. A new department, tentatively named Computer Science and Engineering, is currently being formed starting with faculty from the EECS department. We seek exceptional faculty, at all ranks and in all areas, to help build this new department. The new department is expected to expand existing programs, and to significantly increase research production in computer science and engineering related areas. More details, as they emerge, can be found at: www.cse.lehigh.edu.

Lehigh University is in a beautiful sylvan setting in Bethlehem, Pennsylvania, which is 80 miles west of New York City and 60 miles north of Philadelphia. The area offers an excellent mix of urban and rural lifestyles. Lehigh, with 4500 undergraduates and 2000 graduate students, is small enough to be intimate but large enough to have the advantages of a big institution. The new CSE Department is one of seven departments of the newly endowed P. C. Rossin College of Engineering. Lehigh's longstanding reputation for excellence in engineering enhances opportunities for professional development.

Applications should include a vita, names of at least three references (with both postal and email addresses) and teaching and research statements. Send applications to:

Professor Glenn Blank
Faculty Search Committee
Lehigh University
EECS Department, 19 Memorial Drive
West Bethlehem, PA 18015
Or: compsearch@eecs.lehigh.edu

Lehigh University is committed to recruiting and retaining women and minorities.

Marquette University

Department of Mathematics, Statistics and Computer Science

Assistant Professor of Computer Science

Applications are invited for three tenure-track positions in computer science or closely related disciplines. These positions will begin no later than August 16, 2001. For one position, preference will be given to applicants with expertise in bioinformatics. Candidates should have a Ph.D. in computer science, mathematics, or a closely related discipline, be ready to teach computer science at both the undergraduate and graduate levels, and show a professional commitment to good teaching, to continuing scholarly productivity, and to service. Screening will begin immediately and continue until the positions are filled. The Department of Mathematics, Statistics and Computer Science is a diverse department of twenty-three tenured or tenure-track faculty with undergraduate majors in computer science, computational mathematics, mathematics, and mathematics education. The Department also offers graduate degrees at the master's and doctoral levels. Moreover, it provides support for students in the Department of Electrical and Computer Engineering, a professional master's degree in computing, and a new master's degree in bioinformatics offered jointly with the Medical College of Wisconsin. Marquette University is a Jesuit, Catholic university of about 11,000 students in downtown Milwaukee, Wisconsin, dedicated to teaching, research, and service to humanity. Milwaukee, a great place on a great lake (Lake Michigan) is the core of a metropolitan area of about 1.5 million people, close to Madison, Wisconsin, and Chicago, Illinois, and the locus of vibrant intellectual, cultural, and business communities. Applicants should submit a letter of application, a resume, transcripts, which need not be official, and three letters of reference to:

Prof. John Simms
Department of Mathematics, Statistics and Computer Science
Marquette University
POB 1881
Milwaukee WI 53201-1881

More information is available at http://mscs.mu.edu.

Methodist College

Computer Science Instructor

An Equal Opportunity Employer, is seeking applications for one full-time position in Computer Science (starting in Fall 2001) in the Department of Mathematics and computer Science. Candidates must have a Ph.D. in Computer Science or they must have a Master's Degree in Computer Science and pursuing a terminal degree in Computer Science. The position is open to all areas of Computer Science. Responsibilities include teaching lower and upper level Computer Science courses. In addition, the candidate is expected to help with various duties including the maintaining of the computer systems within the department. Methodist College, in harmony with its tradition, takes seriously its role in the ethical and moral development of students. Members of populations traditionally underrepresented in higher education are encouraged to apply. Rank and salary are commensurate with credentials and experience. The position is open until filled. To apply send a letter of application including a statement of professional goals and teaching philosophy, full resume, three reference, and graduate transcripts to:

Dr. Shivappa Palled, Head,
Department of Mathematics and Computer Science, Methodist College
5400 Ramsey Street
Fayetteville NC 28311-1420
(910) 630-7133/7125.

Michigan State University

Computer Science & Engineering

Teaching Line Position

The Department of Computer Science and Engineering at Michigan State University invites applications for a teaching position, classified as a "Specialist". The successful candidate will join a motivated team with a track record in innovative course development, delivery and assessment. Those interested in research in pedagogy are especially encouraged to apply. The initial appointment will be for a two-year period with potential for long term appointment. The responsibilities for this position include continued development and teaching university-wide introductory computer science service courses. The position also requires training and supervision of graduate teaching assistants and coordinating laboratory sections. This is a 12 month (annual) appointment and salary is dependent on educational background and experience. More than one position may be available.

Applicants for the position must have an advanced degree in Computer Science or related area with substantial teaching or industrial experience. This position will start May 16, 2001. For full consideration, applications should be submitted by March 10, 2001. However, applications will be accepted until the position is filled.

Complete information about Michigan State University and the Computer Science and Engineering Department may be obtained from the web pages; in particular, see the course pages for CSE 101. Applicants should send a letter of intent, resume, the names of three references, and a statement of teaching interests to:

Professional Opportunities

Faculty Search Committee
Department of Computer Science and Engineering
3115 Engineering Building
Michigan State University
East Lansing, Michigan 48824-1226
search@cse.msu.edu

For additional information about the Department, College, and the University, see http://www.cse.msu.edu

Michigan State University is an Equal Opportunity/Affirmative Action Institution and handicappers have the right to request and receive reasonable accommodations.

New York University

Courant Institute of Mathematical Sciences

Director, Courant Institute

The Courant Institute is seeking a new Director.

The Institute is a center for education and research in the mathematical sciences. It is a division of New York University that includes the Departments of Mathematics and Computer Science as well as a variety of sponsored research activities.

The Courant Institute is a leader in many areas of mathematics; for instance in mathematical analysis, differential geometry, probability theory, applied mathematics, and scientific computation. The Institute has a tradition of special emphasis on partial differential equations and their applications. Areas of strength in computer science include algorithmics and graph theory, distributed computing, graphics and multimedia, computational biology, security, and natural language analysis.

The scope of the Institute's scientific activities is very wide. Many topics not usually housed within mathematics or computer science departments like plasma fusion, atmosphere/ocean science, and physiology are represented.

The Courant Institute is responsible for both the undergraduate and graduate programs in mathematics and computer science at New York University. Courant has 46 faculty members in mathematics and 27 in computer science with an additional 35 Ph.D. scientists in postdoctoral or research positions.

We seek a distinguished scientist and leader whose interests are close to the core of the Institute's research activities. The principal responsibilities of the Director are to provide scientific, educational, and administrative leadership; to represent the Institute within the administrative structure of the University; and to help attract funds for the Institute's research and training programs. The Director is a tenured member of one of the two departments and serves as the head of both, assisted by a chair for each department and an extensive administrative staff. The Director reports to the President and to the Provost and works closely with the Deans.

The new Director is expected to take office by September 1, 2002. Nominations and applications (including curriculum vitae) should be submitted promptly to:

Directorship Search Committee
Courant Institute
251 Mercer Street
New York, NY 10012

New York University is an Equal Opportunity/Affirmative Action employer.

Ohio State University

Department of Computer and Information Science

The Department of Computer and Information Science invites applications for at least eight tenured or tenure-track positions. Areas of primary interest include, but are not limited to, networking, database systems, human-computer interaction, artificial intelligence (including speech, vision, and language processing),graphics (including scientific visualization and computer animation), parallel and distributed computing (including operating systems and file systems, network-based computing, metacomputing, mobile computing, and scientific computing), and software engineering (including programming languages, component-based software, and formal methods).

Appointments at all ranks will be considered. Applicants for an assistant professor position should hold or be completing a Ph.D. in computer science or a closely related field, and have a commitment to excellent research and quality teaching. Applicants for a senior position should also demonstrate a strong record of external funding and impact on their field.

The department maintains active collaborative relationships with the Ohio Supercomputer Center, Advanced Computing Center for the Arts and Design, Cognitive Science Center, and many other centers and departments in the university.

To apply, please send a curriculum vita, along with a cover letter, by e-mail to fsearch@cis.ohio-state.edu or by hardcopy to:

Chair, Faculty Search Committee
Department of Computer and Information Science
The Ohio State University
2015 Neil Avenue, DL395
Columbus, OH 43210-1277

Review of applications will begin immediately and will continue until the positions are filled. For additional information please see http://www.cis.ohio-state.edu.

The Ohio State University is an Equal Opportunity/Affirmative Action Employer. Qualified women, minorities, and individuals with disabilities are encouraged to apply.

The Pacific Northwest National Laboratory

(PNNL), building on a strong tradition of research in the Information Sciences, is investing significant resources to leverage the multidisciplinary capabilities of the Laboratory to provide innovations in Information Exploitation Large Scale Information Integration Cyber Security Rich interaction Environments Applied Information Systems Situation Planning and Response Information safeguards and assurance High Performance Computing and Telecommunications Architectures Our research and development focuses on software tools that are designed to eliminate barriers and speed the rate of scientific discovery in many fields. Developed for the government's defense community, that technology is now available in the commercial marketplace. Pacific Northwest's information technology work also encompasses development, operation, maintenance and support of the Laboratory's information resource management systems, and engineering of the Laboratory's computing and communications infrastructure to facilitate virtual collaboration and use of sophisticated instrumentation with other national laboratories and academic institutions. As steward of one of the largest super parallel computing capacities in the world, as well as a variety of other systems, Pacific Northwest has expertise that allows people and organizations to increase productivity and enhance their ability to collaborate with others in solving complex technical and scientific problems.

I am writing to seek your assistance in identifying an individual who might be interested in a key leadership role at PNNL. We are in search of a Chief Architect to take IS&E to the next level of accomplishment. We expect the successful candidate for this position will have strong breadth of theoretical and applied knowledge of systems architecture and systems engineering, with a particular emphasis on software and applied expertise. The position requires a technical leader who will work well with project teams on advanced information systems. The candidate must be able to effectively communicate and work with management to create the IS&E architecture vision, with the project managers and staff to effectively implement the architectural concepts, and with laboratory leadership to foster acceptance of systems architecture approaches in projects and initiatives. To this end, the candidate will be an evangelist for systems architecture principles and practices. The position will also require outstanding written and oral communication skills, as well as negotiation skills. The candidate must be a good risk manager. The candidate must be a leader in the systems architecture technical community, and help establish PNNL reputation in that discipline. The successful candidate will have an MS or Ph.D. with a strong Computer Science background and 10-15 years experience. The individual must have a national or international reputation in system architecture and have a good track record of publications. The experience set must include building complex architectures for large programs. PNNL is a multi-program national laboratory operated by Battelle for the U.S. Department of Energy. Located in southeastern Washington State on the last free-flowing stretch of the Columbia River, the city of Richland offers a relaxed lifestyle with easy access to recreation areas, major cities and colleges. Please visit our Information Technology showcase at http://multimedia.pnl.gov:2080/showcase/. There is some urgency in filling this position; if you can think of someone who may be qualified and interested, please contact:

Paul Simpkins
phone at 509-375-2211

or e-mail so that we can contact the candidate as soon as possible. Please send curriculum vitae directly to paul.simpkins@pnl.gov.

Purdue University

Department of Computer Sciences

[posted 10/12/00]

The Department of Computer Sciences at Purdue University invites applications for tenure-track positions beginning August 2001. Positions are available at the assistant professor level; senior positions will be considered for highly qualified applicants. Applications from outstanding candidates in all areas of computer science will be considered. Areas of particular interest include networking and distributed systems, security, graphics, and emerging areas of computing.

The Department of Computer Sciences offers a stimulating and nurturing academic environment. Thirty-three full-time faculty have research programs in analysis of algorithms, databases, distributed and parallel computing, geometric modeling and scientific visualization, information security, networking and operating systems, parallelizing compilers, programming languages, scientific computing, and software engineering. The department implements a strategic plan for future growth which is strongly supported by the higher administration. This plan includes a new building expected to be operational in 2004 to accommodate the significant growth in faculty size. Further information about the department is available at http://www.cs.purdue.edu.

Applicants should hold a Ph.D. in Computer Science, or a closely related discipline, and should be committed to excellence in teaching and have demonstrated strong potential for excellence in research. Salary and benefits are highly competitive. Special departmental and university initiatives are available for junior faculty. Candidates should send a curriculum vitae, a statement of career objectives, and names and contact information of at least three references to:

Chair
Faculty Search Committee
Department of Computer Sciences
Purdue University
West Lafayette, IN 47907-1398

Applications are being accepted now and will be considered until the positions are filled. Inquiries may be sent to personnel@cs.purdue.edu.

Purdue University is an Equal Opportunity/Affirmative Action employer. Woman and minorities are especially encouraged to apply.

Purdue University

School of Electrical and Computer Engineering

seeks outstanding candidates in computer engineering for research and teaching in the following areas: artificial intelligence, compilers, computer graphics, computer architecture, computer networks, distributed computing, multimedia systems, operating systems, software engineering, VLSI and CAD. Strong candidates in all areas of computer engineering are encouraged to apply. Openings are for tenure-track faculty at all levels.

Send a resumé, including a statement of research and teaching interests and a list of at least three references to:

Head, School of Electrical and Computer Engineering
Purdue University
1285 EE Building
West Lafayette, IN 47907-1285

Applications will be considered as they are received.

Purdue University is an Equal Opportunity/Affirmative Action employer.

Rutgers University

Faculty Positions

Rutgers University's strategic plan calls for significant increases in Computer and Information Sciences. Consequently we are seeking candidates for a visiting position, junior positions, and senior positions in all areas of Computer Science and in Bioinformatics.

We are partners in major centers in theoretical computer science(DIMACS), cognitive science (RUCCS), wireless and mobile computing (WINLAB), the Center for Advanced Biotechnology and Medicine (CABM), and the Waksman Institute among others. For more details, see http://www.cs.rutgers.edu.

Our department also has close ties to industry including AT&T, Cisco, Hewlett-Packard, Lucent, Microsoft, NEC, Siemens, and Sun, as well as several emerging companies in the New York area.

To apply please submit a curriculum vita including names of at least four professional references to:

Hiring Chair
Department of Computer Science
Rutgers, the State University
110 Frelinghuysen Road
Piscataway, NJ 08854-8019

by February 1, 2001 or send email to hiring@cs.rutgers.edu for further information. We especially encourage applications from women and other underrepresented groups.

Stanford University

School of Engineering Computational Mathematics and Engineering

The School of Engineering at Stanford University is developing an exciting new school-wide initiative in computational mathematics and engineering, taken in the broadest sense. An Institute of Computational Mathematics and Engineering [ICME] will be formed at the school level to carry out this initiative. It will be a key role of the institute to reach out to existing efforts in the school in the computational mathematics and engineering area, and then to integrate these research and curriculum activities across Stanford's School of Engineering.

Applications are sought for tenured and tenure-track positions. The successful applicant(s) will play a central role in bringing the Institute into being. Appointment will be at a rank commensurate with the applicants' experience. The School expects to make a number of appointments in computational mathematics and engineering in the near future, to provide significant space for Institute activities in a presently planned school facility, and to develop computing resources, academic and research facilities, and student fellowships and resources.

At this time two appointments may be made if suitable candidates are found, one at a tenured senior level and one at a junior tenure-track level. The senior candidate must be an eminent scholar in the area of computational mathematics and engineering with vision and energy. This person must (1) be able to demonstrate that her/his work has actual or potential applications in the engineering context and (2) have shown leadership skills and accomplishments. The successful applicant(s) will be expected to teach and perform research in the computational mathematics and engineering area and to provide leadership in expanding the School's activities in this arena.

The computational mathematics and engineering initiative will focus on activities ranging from mathematical modeling to developing and analyzing numerical algorithms to problems of implementation in a modern computational environment. The journals of SIAM cover a broad range of subjects that one can imagine being the domain of the ICME. There are a number of classical numerical analysis and applied mathematics areas in computational mathematics and engineering, as well as, for example, computer-aided design, synthesis, and verification; simulation; optimization; signal processing; computational biology; financial engineering, etc.

Successful applicants will be appointed to a faculty position in one of the School of Engineering's eight departments, but will dedicate a significant portion of their time to academic and scholarly activities in the ICME. The candidate will select her/his departments in consultation with the Dean of Engineering. At present the School of Engineering is home to eight departments, 219 faculty members, and over 3000 students. In fact, nearly one quarter of all Stanford University students is enrolled in the School of Engineering. There is an ongoing Scientific Computing and Computational Mathematics Program (SCCM), in which about 30 doctoral students and a dozen masters' degree students are enrolled,

(continued)

Professional Opportunities

and whose activities are in the domain of computational mathematics and engineering. In addition to the eight departments, the school has several interdisciplinary research and teaching centers, more than 30 laboratories, and many cross-disciplinary programs with other academic units on campus, including Medicine, Business, Law, Earth and Physical Sciences, Linguistics, and Music.

Applicants should send a letter containing a brief statement of interest that includes a description of their potential role in the computational mathematics and engineering effort. Enclosures to the letter should include a resume (including research accomplishments, teaching experience, publications), and the names and postal and e-mail addresses of at least five references. Senior applicants are asked to include a statement of their vision for the planned institute. Tenure-track applicants only are asked to enclose transcript(s) of (doctoral) graduate study. The letter and enclosures should be sent to:

Robert L. Street, Chair
CME Search Committee & Campbell Professor in the School of Engineering,
Environmental Fluid Mechanics Laboratory
Stanford University
Stanford, CA 94305-4020

Applicants are encouraged to submit their materials by April 1, 2001.

Stanford University is an equal opportunity employer and welcomes both nominations of women and minority group members and applications from them.

Stevens Institute of Technology

Computer Science Department

The Computer Science Department at Stevens Institute of Technology invites applications for tenure track positions at all levels, starting in September 2001. Applicants with expertise in networking, distributed systems, security, and software engineering are preferred; however, quality independent of area will be the most important factor in evaluating applicants.

The department, organized into its present form only in 1996, has established full curricula at the BS, MS, and PhD levels as well as substantial research efforts in programming languages, software engineering, computer vision, graph algorithms, and semantics. Research support includes several NSF grants (including two CAREER grants recently awarded to junior faculty), close ties with nearby industrial labs such as AT&T Research and Lucent Bell Labs, and participation in two large multi-university state-supported centers of excellence in software engineering and wireless communication.

Successful senior applicants must have a strong record of research accomplishment. Junior applicants must show evidence of outstanding promise. Prospective faculty can look forward to a research environment in which collaboration with industry is encouraged.

The department resides within the School of Applied Science and Liberal Arts, one of three schools within the university of approximately 115 faculty, 1600 undergraduate and 2000 graduate students. Stevens, established in 1870, is located in Hoboken New Jersey, a small, charming, and gentrified town that lies across the Hudson River from midtown Manhattan. The university has a bucolic campus on Castle Point, a high promontory overlooking the river. As seen at http://www.cs.stevens-tech.edu/~djd/manhattan.html, the campus enjoys spectacular views of the entire length of the island of Manhattan.

Salary and rank will be commensurate with qualifications and experience. Applicants should send a curriculum vitae, list of publications, and a statement of current and planned research. Candidates should also arrange to have at least three letters of recommendation sent directly to us without awaiting our request to referees. All these materials may be sent by email in ASCII, PostScript, or PDF format to:

djd@cs.stevens-tech.edu
or by post to:
Faculty Search Committee
Computer Science Department
Stevens Institute of Technology
Castle Point on Hudson
Hoboken, NJ 07030

Stevens is an Equal Opportunity/Affirmative Action employer. Women and minorities are particularly encouraged to apply.

University of Alaska Fairbanks

Department of Mathematical Sciences

Assistant/Associate Professor of Computer Science

The Computer Science Faculty invites applications for tenure track faculty positions beginning in January 2001 or August 2001. Visiting positions may also be available. Faculty at the level of assistant or associate will be considered depending on qualifications and experience.

The University is embarking on a major upgrade of its graduate computer science program with special emphasis on data systems, high-speed scientific computing and mathematical modeling. Applicants must have a Ph.D. in Computer Science or equivalent. Preference will be given to applicants with research experience in high performance computing, mathematical and computer modeling, numerical analysis, parallel algorithms or software engineering. Applicants must be eligible to work in the USA. The duties of the position include teaching at the undergraduate and graduate levels, research (may include a joint appointment with a research institute) and service.

The salary is competitive and fringe benefits excellent. The closing date for applications is open until the positions are filled. The University of Alaska Fairbanks is the major research institution in the University of Alaska system. UAF offers an accredited BS, an MS and an interdisciplinary Ph.D. in Computer Science. A graduate program in Computational Science is currently being developed. Possibilities exist for joint appointments with several internationally known research institutes on the UAF campus, including the Arctic Region Supercomputing Center, the International Arctic Research Center and the Geophysical Institute. A commitment to quality teaching is essential and we seek candidates who will strengthen our graduate programs and also appreciate the unique geography and climate of the region.

Fairbanks is a modern city with approximately 84,000 residents located in Interior Alaska between the Alaska and Brooks mountain ranges and is noted for the scope of available outdoor activities in all seasons.

For more information, visit www.cs.uaf.edu. To apply, please forward a curriculum vita, three letters of reference, and a statement of research and teaching interests to:

Dr. Chris Hartman
Department of Mathematical Sciences
P.O. Box 756660
Fairbanks, AK 99775-6660
or by e-mail to ffcmh@uaf.edu

UAF is an EEO/AA Employer and Educational Institution.

University of Alberta

Department of Computing Science

Do you have a commitment to the science of computing? Are you looking for an academic environment that focuses on the science of your discipline? Join us in a dynamic Computing Science department, known for its collegial atmosphere and collaborative research environment. Our department is in the Faculty of Science at the University of Alberta, in Edmonton, the capital of Alberta. We have eight established research laboratories, including Algorithmics, Artificial Intelligence and Cognitive Science, Database Management, Graphics, Networks and Communications, Distributed Systems, Software Engineering, and Vision and Robotics. We have abundant computing facilities, and our department leads broadly-based multidisciplinary research within the Multimedia and Advanced Computational Infrastructure (MACI) project, and the Research Institute for Multimedia Systems (RIMS). In addition to the standard computational research facilities, we also have a large SGI Origin 2000, and a 3D immersive display powered by an SGI Onyx2. We are currently constructing a new research laboratory building adjacent to a renovated historical building, to provide us with office and research space consolidated in the middle of our campus of about 30,000 students (see the WebCam at www.cs.ualberta.ca). Our current complement of 35 regular faculty work within a department of 28 support staff, 140 graduate students (50/50 MSc/PhD) and 400 undergraduate students. Our consistent performance in ACM World Programming Contests is evidence of our claim to be one of the best undergraduate programs in the country, and our graduate students are successful in industrial and academic research labs around the world. We are looking for 15 highly productive eager computing scientists to complement our strengths in all areas. We are especially keen on those who can demonstrate that they are driven by curiosity and interested in collaborative research with existing faculty across sub-disciplines. Candidates should have, or be at the completion stage of degree, a PhD in Computing Science, a proven research record, and a strong commitment to excellence in teaching. Responsibilities include research as well as teaching at the graduate and undergraduate levels. Most positions will be at the assistant professor level, however, we will consider associate and full professor appointments for outstanding candidates. We offer an environment that is congenial and supportive of new PhDs, with the challenge to help you be your best, and the support to help you succeed within an academic environment. Our department is part of a full-service university, in a province that has the fastest economic growth in the country, and we enjoy strong collaborative ties with local industry. Competition will remain open until suitable candidates are chosen. Find further details about us at www.c s.ualberta.ca and send your curriculum vita and the names and addresses of three referees to:

Iris Everitt, Administrative Assistant
Department of Computing Science
University of Alberta
Edmonton, Alberta, Canada T6G 2E8
or everitt@cs.ualberta.ca

The records arising from this competition will be managed in accordance with provisions of the Alberta Freedom of Information and Protection of Privacy Act (FOIPP). The University of Alberta hires on the basis of merit. We are committed to the principle of equity of employment. We welcome diversity and encourage applications from all qualified women and men, including persons with disabilities, members of visible minorities, and Aboriginal persons.

NATIONAL UNIVERSITY of SINGAPORE

Founded 1905

DEPARTMENT OF COMPUTER SCIENCE

FACULTY APPOINTMENTS

The Computer Science Department of the National University of Singapore is looking to add several members to its tenure-track faculty. We will consider applications from all areas and at all ranks.

NUS is a research university, with low teaching loads, excellent facilities, ample research funding and support for conference travel. The Computer Science Department (see http://www.comp.nus.edu.sg) has many enthusiastic and talented faculty members in a variety of areas, and its student body includes some of the best in the region. It offers undergraduate programs in computer science and computer engineering and a graduate program awarding Masters and Ph.D. degrees. Pay and benefits are competitive with the top universities around the world.

We are looking for people with demonstrated potential to be outstanding in both research and teaching. If you are interested, please send your curriculum vitae and the names and addresses of at least three referees to: csrec@comp.nus.edu.sg.

Visit the University's website at http://www.nus.edu.sg for more information.

The University of Chicago

Department of Computer Science

The Department of Computer Science at the University of Chicago is recruiting at all levels in a wide range of topic areas, including but not limited to AI, bioinformatics, systems, and theory.

The University of Chicago has the highest standards for scholarship and faculty quality — and the Computer Science Department's charge and goal is substantial growth through appointments that will enhance the quality and prestige of our University. We especially value faculty whose research has impact and visibility beyond Computer Science. The University and Argonne National Laboratory established the Computation Institute to facilitate such interdisciplinary research.

The Chicago Metropolitan area is diverse and exciting. The local economy is vigorous, with international stature in banking, trade, commerce, manufacturing, and transportation, while the cultural scene can boast diverse cultures, vibrant theater, world renowned symphony, opera, jazz, and blues, not to mention the best pizza in the world.

Please send nominations or applications to:
Professor Stuart A. Kurtz, Chairman
Department of Computer Science
The University of Chicago
1100 E. 58th Street
Ryerson Hall
Chicago, IL 60637

The University of Chicago is an equal opportunity/affirmative action employer, and encourages applications from under-represented

University of Florida

Department of Computer and Information Science and Engineering

Department Chair

The Department of Computer and Information Science and Engineering at the University of Florida invites applications and nominations for the position of Professor and Department Chair starting Fall 2001. Candidates are expected to have a strong commitment to excellence in undergraduate and graduate education, a distinguished scholarly and research record, and experience in academic administration. A Ph.D. in computer science or a closely related field with academic credentials for a Professorship is required.

The department currently consists of 29 tenure-track faculty and offers B.S., M.S., and Ph.D. programs to a student body of approximately 300 graduate and 1600 undergraduate students. The Department encompasses a wide range of research areas including high performance computing, database systems, computer vision, graphics, visualization and simulation, computer networks and security, distributed and real-time systems, and software engineering.

In addition, the department has several tenure-track faculty positions open at all ranks. Its continued growth is a high priority of the College of Engineering. The new chairman will have the opportunity and commitment from the University to lead a dynamic and growing department with strong ties to many interdisciplinary programs. Salary will be competitive and commensurate with qualification.

The search committee will begin reviewing applications on April 5, 2001 and will continue to receive applications until the position is filled. Candidates should send a curriculum vitae with the names of at least three references to:

Dr. Randy Chow
Chairman, Search Committee
Department of Computer and Information Science and Engineering
301 CSE, PO Box 116120
University of Florida
Gainesville, FL 32611
e-mail: chow@cise.ufl.edu
Tel: (352) 392-1487

The University of Florida is an Affirmative Action/Equal Opportunity Employer and women and minorities are encouraged to apply. For more information about the department and the position, please visit http://www.cise.ufl.edu/

University of Houston

Department of Computer Science

The Department of Computer Science at the University of Houston (UH) seeks applicants for the position of Department Head. The successful candidate is expected to provide vigorous leadership in building the department, including the recruitment of several new faculty, building the funded research base, and interacting with the administration of the University and departmental faculty on long range planning. Areas of concentration are: communications, networks, computational science, computer graphics/vision, databases, and scientific/engineering data visualization.

The Department is experiencing a period of strong growth and expects this trend to continue. The Head will also lead in maintaining an innovative curriculum and to continue and initiate collaborative research programs.

Applicants should have a Ph.D. in computer science or a related field and have a strong interest in both teaching and leading-edge research. Successful candidates may affiliate with the Texas Center for Computational and Information Sciences (TCCIS), the Texas Learning and Computation Center (TLC2), and/or the Virtual Environments Research Institute (VERI). TCCIS, TLC2, VERI, and the department have a substantial infrastructure to support both teaching and research activities (see www.cs.uh.edu, www.tccis.uh.edu, and www.vetl.uh.edu). UH, together with Rice University, Baylor College of Medicine, and Texas A&M University, operates a regional OC-12 network connected to the vBNS. UH is also a charter Internet2 member. The department is affiliated with the Center for Research in Parallel Computation (Rice) and both NSF Partnerships for Advanced Computing Infrastructure. Significant opportunities for collaborative research exist within the University and with the Texas Medical Center, the NASA/Johnson Space Center, and the region's oil/gas industry.

UH is an equal opportunity/affirmative action employer. Minorities, women, veterans, and persons with disabilities are encouraged to apply.

Applications, including a resume, a list of publications and funding, and the names of at least five references should be sent to:

Department Head Search Committee
Department of Computer Science
Mail Stop CSC-3475
Houston, TX 77204-3475 USA
713-743-3343 (voice)

Professional Opportunities

713-743-3335 (fax)
johnson@cs.uh.edu (email)

Review of applications will begin immediately and will continue until the position is filled.

University of Kentucky
Department of Computer Science

The University of Kentucky Computer Science Department invites applications for several tenure-track positions beginning August 15, 2001 at all levels. Candidates should have a PhD in Computer Science or a related discipline. Review of credentials will begin on November 1, 2000, and the search process will continue until suitably qualified candidates are found.

We are interested in candidates with expertise in all areas of computer science. Candidates in the areas of computer graphics, computer vision and multimedia will receive special consideration. Appointed individuals will be expected to conduct innovative research and participate in the Department's undergraduate and graduate instructional programs.

The Department of Computer Science offers BS, MS and PhD degrees. There are about 500 undergraduate and 100 graduate students currently enrolled. Our faculty are actively involved in research in artificial intelligence, computer vision, cryptography, databases, graphics and image processing, networking, numerical analysis, operating systems and theory. Most of this research is supported by external grants and contracts.

The Department is currently experiencing a period of dynamic growth. It was selected by the University as one of eleven programs for substantial enhancement funding. Equipment and Infrastructure grants from the National Science Foundation support state-of-the-art research computing facilities in the department, and in the Laboratory for Advanced Networking which opened in Summer 2000. Generous start-up funds are available to all new computer science faculty.

The University of Kentucky is the flagship graduate degree-granting institution in Kentucky, strongly committed to the goal of maintaining research and teaching excellence and high national visibility. The Center for Robotics and Manufacturing Systems and the Center for Computational Sciences, located on campus, greatly enhance research opportunities.

The University of Kentucky is an equal-opportunity employer and especially encourages applications from women and minority candidates.

Please send curriculum vitae and the names of three references to:

Faculty Search Committee
c/o Ms. Diane Mier
Department of Computer Science
University of Kentucky
Lexington, KY 40506-0046
E-mail: diane@cs.engr.uky.edu
Fax: (859) 323-1971

An equal opportunity / affirmative action employer

University of Manitoba
Department of Computer Science
Assistant Professor

Applications are invited for eight full-time tenure-track positions, at the Assistant Professor level, commencing July 1, 2001, or as soon as possible thereafter. These positions are part of the Computer Science Development Plan, which has been approved and funded by the Manitoba Provincial Government. Minimum qualifications are PhD in Computer Science or allied discipline, complete or completed at time of appointment, and evidence of a strong research potential in Computer Science. Prior teaching experience will be considered an asset. A Faculty of Science startup research grant will be awarded to all newly appointed faculty members.

Our greatest need is for candidates in applied areas of Computer Science, including databases, artificial intelligence, human computer interaction, software engineering, programming languages and compilers, operating systems, networks and parallel systems. We are also actively seeking candidates in recently emerging areas, such as multimedia, mobile computing, Web-centric computing, computational finance and computational biology. In addition, outstanding candidates in other areas will be considered. Duties will include undergraduate and graduate teaching and supervision, research, and service-related activities.

The Department currently has 25 full-time tenure-track faculty members plus a number of teaching appointments, and offers a full range of both undergraduate and graduate programmes, including cooperative programmes. We currently have over 60 graduate students.

The Department is a well-established one, which has recently entered into an exciting expansionary phase. The Computer Science Department Development Plan is a new initiative, funded by the Provincial Government of Manitoba. The Plan provides $3.6 million of additional, special funding over four years for the expansion of the Computer Science department. The Plan includes ten new faculty positions, as well as new support staff positions, several new undergraduate teaching laboratories, and significant upgrading of infrastructure. In addition, a new Information Technology and Computing Centre is being planned; the centre will house the teaching and research activities of the department. Current and planned departmental facilities include numerous UNIX-based workstations, a parallel computing laboratory, a software development and testing laboratory, an advanced networking lab with a 20-machine network testbed, an 8-way multiprocessor, and a parallel systems lab housing a 16-processor cluster supporting three different gigabit interconnects. All laboratories and faculty and graduate student offices are inter-connected and connected to the Internet. The University of Manitoba is a central hub in CA*net 3, Canada's national gigabit network, and is also directly connected to the GigaPOP in Chicago. Large-scale parallel computing access is also available via CA*net 3. Funding has already been secured to create additional new labs over the next three years and other major developments are underway to further increase the department's computational capacity.

The Department provides excellent technical support for both teaching and research. Several faculty members have ongoing industrial sponsorships for their research through TRLabs, Manitoba Hydro, and the Internet Innovation Centre.

Winnipeg has a great deal to offer, both culturally and recreationally, with a number of professional and ethnic arts groups, professional sports teams, outstanding restaurants, and many opportunities nearby for all types of outdoor activities in all seasons. The Winnipeg housing market is one of the most favourable in Canada to the homebuyer.

This is an excellent opportunity for individuals with outstanding research potential and a commitment to excellence in teaching to get in on the ground floor of an exciting, expanding department. The University of Manitoba encourages applications from qualified women and men, including members of visible minorities, aboriginal peoples, and persons with disabilities. Priority consideration will be given to Canadian citizens and permanent residents.

Further information concerning the Department and the University may be obtained from the Department's website and the University's website.

Applicants should send a curriculum vitae and the names of three referees to the address below. Qualified women are particularly encouraged to apply. Consideration for the positions will commence immediately and will continue until June 30, 2001 or until the positions are filled.

Chair of Search Committee
Department of Computer Science
University of Manitoba
Winnipeg, Manitoba R3T 2N2 Canada
E-mail:search@cs.umanitoba.ca
Telephone: (204) 474-8313
Fax: (204) 474-7609
Website: www.cs.umanitoba.ca

University of Maryland Baltimore County
AetherSystems Distinguished Professorship

The Department of Computer Science and Electrical Engineering (CSEE) of the University of Maryland Baltimore County (UMBC) invites applications for the AetherSystems Distinguished Professorship at the Full or Associate Professor level in the general area of mobile computing and wireless networks. Particular areas of interest include mobile networks, mobile data management and mobile databases, m-commerce, pervasive computing environments, service description, discovery and negotiation, applications of mobile and pervasive systems, and allied areas.

The appointee will serve as the first AetherSystems Professor and will enjoy access to substantial resources. These will be provided through a new center in the Mobile Computing area which is in the process of being established through a generous gift from AetherSystems Incorporated. The appointee is expected to collaborate with existing faculty in the Department working in these areas. In addition, the appointee will help select additional junior positions in this area to which the Department is committed.

Applicants must have an established record of excellence in research and teaching, and a strong record of consistent and substantial externally funded research activity, and must have a Ph.D. in computer science, computer engineering, electrical engineering, or a related discipline.

The Department offers B.Sc., M.Sc., and Ph.D. degrees and has 34 full-time faculty members, and about 1200 undergraduate majors and 200 graduate students. We received over $7.5M in sponsored research support last year and are planning on significant growth. We expect to move into a new building for information technology and engineering in 2002.

Applications, including CV, and a statement of teaching and research interests and

(continued)

Professional Opportunities

UNIVERSITY OF UTAH
School of Computing
Tenure Track Faculty Positions

The University of Utah's School of Computing seeks applicants for tenure-track faculty positions at all levels. From its original concentration on computer graphics, Utah's School of Computing has expanded its focus to include large, multi-investigator efforts addressing large-scale problems of significant impact in the areas of CAD/CAM, virtual environments, architecture and systems, VLSI, scientific computation and visualization, robotics, natural language processing, and computer vision, as well as a number of individual investigator research activities. Research areas and course offerings benefit from the quality and breadth of our faculty and emphasize a balance of theoretical foundations and practical engineering. As the School of Computing, we have been funded to expand from 22 to 30 regular faculty members, and we have several open positions. We will consider strong candidates in all areas of computer science, but we especially seek candidates in scientific computing & visualization, and networking.

Applicants should have earned a Ph.D. in Computer Science or a closely related field. The University of Utah is located in Salt Lake City, the hub of a large metropolitan area with excellent cultural facilities and unsurpassed opportunities for outdoor recreation only a few minutes drive away. Additional information about the school can be found at http://www.cs.utah.edu. Please send Curriculum Vitae, a research goals statement, a teaching goals statement, and names and addresses of at least four references to: Faculty Recruiting Committee, c/o Shawn Darby, School of Computing, 50 So. Central Campus Drive, Rm 3190 MEB, University of Utah, Salt Lake City, UT 84112-9205. The University of Utah is an Equal Opportunity, Affirmative Action Employer and encourages nominations and applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees.

John E. and Marva M. Warnock Presidential Endowed Chair
for Faculty Innovation in Computer Science

The School of Computing at the University of Utah is pleased to announce the establishment of the John E. and Marva M. Warnock Presidential Endowed Chair for Faculty Innovation in Computer Science. Support for the Chair derives from a substantial gift provided by the Warnocks for this purpose.

The School also announces its search to hire an outstanding junior faculty candidate to become the first recipient of this newly established chair. At the donors' request the recipient of the endowed chair shall be a junior, untenured faculty member in the School of Computing. The recipient shall be appointed to the chair for up to six years, after which time he/she will be expected to have established a record of excellence in teaching and research that will be sufficient to advance independently of the chair.

Candidates for the John E. and Marva M. Warnock Presidential Endowed Chair will be considered from the pool of qualified candidates applying for the tenure-track positions announced in the companion advertisement. Strong candidates in all areas of computer science are encouraged to apply.

goals, should be sent to:
Mobile and Wireless Faculty Search
Department of Computer Science and Electrical Engineering
University of Maryland Baltimore County,
1000 Hilltop Circle,
Baltimore, MD 21250
phone: 410-455-3500
fax: 410-455-3969

Applications may be submitted electronically (in PDF only) to: mobilesearch@cs.umbc.edu.

Applicants should arrange for three letters of reference to be sent to the same address. Selection of candidates will start immediately, and will continue until the position is filled.

Further information about UMBC and the CSEE Department can be obtained through the WWW server http://www.csee.umbc.edu/.

UMBC is an affirmative action/equal opportunity employer.

University of Maryland Baltimore County
Department of Computer Science and Electrical Engineering

The Department of Computer Science and Electrical Engineering (CSEE) of the University of Maryland Baltimore County (UMBC) invites applications for tenure-track faculty positions at the rank of Assistant Professor. Higher ranks may be considered.

We are especially interested in applicants in the areas of computer engineering, software systems, computer graphics, or computer networks, but outstanding candidates in other areas will be considered. Applicants must have, or be about to receive, a Ph.D. in computer science, computer engineering, electrical engineering, or a related discipline.

The Department offers B.Sc., M.Sc., and Ph.D. degrees and has 34 full-time faculty members, and about 1200 undergraduate majors and 200 graduate students. We received over $7.5M in sponsored research support last year and are planning on significant growth. We expect to move into a new building for information technology and engineering in 2002.

Applications, including CV, and a statement of teaching and research interests and goals, should be sent to:
CS Faculty Search,
Department of Computer Science and Electrical Engineering, University of Maryland Baltimore County
1000 Hilltop Circle
Baltimore, MD 21250.
Phone: 410-455-3500
Fax: 410-455-3969

Applicants should arrange for three letters of reference to be sent to the same address. Selection of candidates will start immediately, and will continue until all the positions are filled.

Further information about UMBC and the CSEE Department can be obtained through the WWW server http://www.csee.umbc.edu/.

UMBC is an affirmative action/equal opportunity employer.

The University of Maryland Eastern Shore
Department of Mathematics and Computer Science
Assistant/Associate Professors (2)

The University of Maryland Eastern Shore invites resumes for two, tenure track, full-time positions in Computer Science. Salary for both positions is commensurate with experience and qualifications. Responsibilities include teaching twelve hours of undergraduate computer science courses in computer science and mathematics; advising students; participating in service activities to the campus and community; and a commitment to research. Ph.D. in Computer Science or related field. Prior teaching experience at the university level required. Candidate must have record of scholarly and research accomplishments, effectiveness in undergraduate teaching and evidence of quality service.

The University of Maryland Eastern Shore, is a historically black, public, 1890's Land Grant Institution in the University System of Maryland. It is located in a small, historic town of Princess Anne, which is tow-hour drive from any one of several mid-Atlantic metropolitan areas-Norfolk, Washington, DC, Baltimore, and Philadelphia-providing access to many urban amenities. The university has an enrollment of 3056 students and offers degrees at the Bachelor. Master and Doctoral level. The Department of Mathematics and Computer Science offers bachelor degrees in Mathematics, Mathematics-Teaching, and Computer Science with concentrations in Business and Science; and masters degree in Applied Computer Sciences.

Resume review will begin on January 10, 2001 and continue until the positions are filled. Qualified candidates should send letter of interest, a statement of educational philosophy, current resume, unofficial transcripts (official transcripts and completion of the UMES application will be required once the candidate is selected) and three professional letters of references (sent directly by reference) to:
Department of Human Resources
University of Maryland Eastern Shore
Princess Anne, MD 21853-1299

The University System of Maryland is an EEO/AA employer. The successful candidate must be able to show acceptable documentation establishing the right to accept employment in the United States of America. Minorities, women and persons with disabilities are encouraged to apply.

The University of Michigan Ann Arbor
Computer Science and Engineering
Faculty positions

Applications and nominations are solicited for several junior and senior faculty positions in the Computer Science and Engineering (CSE) Division. Qualifications include an outstanding academic record, a doctorate or equivalent in computer engineering or computer science, and a strong commitment to teaching and research. Candidates from all areas of computer science and engineering will be considered.

The University of Michigan is a Non-Discriminatory/Affirmative Action Employer.

Please send resume and names of three or more references to: Professor John E. Laird Associate Chair for Computer Science and Engineering Division and Chair of the CSE Faculty Search Committee Department of Electrical Engineering and Computer Science
University of Michigan
1301 Beal Avenue, Room 3402
Ann Arbor, MI 48109-2122
URL: http://www.eecs.umich.edu/cse

You may submit applications and inquiries via email to csesearch@eecs.umich.edu

The University of Michigan, Ann Arbor
Computer Science and Engineering
Lecturer Positions

Applications for lecturer positions in Computer Science and Engineering are being accepted immediately for the January 2001 teaching term. Qualifications include an outstanding academic record, a doctorate or equivalent in computer engineering or computer science, and an excellent teaching record. Candidates from all areas of computer science and engineering will be considered.

The University of Michigan is a Non-Discriminatory/Affirmative Action Employer.

Please send resume and names of three or more references to:
Professor John E. Laird
Associate Chair for Computer Science and Engineering Division and
Chair of the CSE Faculty Search Committee
Department of Electrical Engineering and Computer Science
University of Michigan
1301 Beal Avenue, Room 3402
Ann Arbor, MI 48109-2122
URL: http://www.eecs.umich.edu/cse

You may submit applications and inquiries via email to csesearch@eecs.umich.edu

The University of Missouri-Columbia
Department of Computer Engineering and Computer Science
Announcement of Faculty Positions

The Department of Computer Engineering and Computer Science invites applications for several tenure-track positions. Applicants should have or are about to complete a PhD in Computer Engineering, Computer Science, or a related field. They should show evidence of excellent research and teaching promise. Outstanding senior faculty will also be considered. Successful applicants will be expected to establish a quality research program, to teach both graduate and undergraduate courses, and to participate in student advising. The open positions are primarily focused in:

• Computational Mathematics. Research will emphasize cryptography and associated computational security issues. The applicant will have the opportunity to collaborate with the Department of Mathematics.

• Bioinformatics. Research will emphasize the manipulation of large databases primarily in genetic systems and computational biology. The successful candidate will need to interact with various departments and participate in research projects in crop genomics, in particular, the Missouri Maize Genome Project. Senior candidates must have an outstanding research and excellent funding record. Exceptional candidates may qualify for a named professor position. The department encourages senior level applicants for this position.

• Knowledge based health care. This position is in collaboration with the Department of Health Management and Informatics. Areas of specialization include but are not limited to medical imaging, digital libraries, artificial intelligence, storage and processing of images, social computing.

• Networking. Research will focus on data communications and networking, including but not limited to wireless, ubiquitous computing, protocols and networking architecture, high performance systems, computer networks performance. Applicants must have an outstanding research and excellent funding record. The department encourages senior level applicants for this position.

• Networked Learning Systems. Research areas include but are not limited to natural language processing, human computer interaction, and web-multi media applications. The applicant will have the opportunity to collaborate with the School of Informational Science and Learning Technologies.

• Theoretical Computer Science. The successful candidate will be expected to develop a research program in various areas of computer science, including but not limited to computational geometry, theory of computation, compiler design, programming languages and applications.

The Department of Computer Engineering & Computer Science has established several outstanding federally and industrially funded research programs in computational intelligence, multimedia processing, telecommunications, decision support, image processing, computer vision, speech understanding, visualization, pattern recognition, databases, digital libraries, networking, computer architecture, parallel processing, robotics, and various IT applications.

Please send a resume, a statement of teaching and research plan, and three references to:
Faculty Search Committee Chair
Department of Computer Engineering and Computer Science
201 Engineering Building West
University of Missouri-Columbia
Columbia, Missouri 65211-2060
http://www.cecs.missouri.edu .

Qualified applicants will be considered until positions are filled. Positions are expected to start in August 2001.

The University of Missouri is an Equal Opportunity and Affirmative Action employer. To request ADA accommodations, please contact our ADA Coordinator by e-mail at adawww@showme.missouri.edu, or call (573) 884-7278.

University of Oregon
Department of Computer and Information Science
Faculty Positions

The Department of Computer and Information Science has multiple tenure-track faculty positions open for Fall 2001. Applicants must have a Ph.D. in computer science and be committed to excellence in both teaching and research. Primary consideration will be given to applicants in the areas of programming languages, networking, parallel and distributed systems. However, outstanding candidates in other areas will be seriously considered.

Applicants should send their curriculum vitae, the names of at least four references, a statement of research and teaching interests, and selected publications to:
Faculty Search Committee
Dept. of Computer and Information Science
University of Oregon
Eugene, OR 97403-1202
email: faculty.search@cs.uoregon.edu

Review of applications will begin on January 15, 2001 and continue until the positions are filled.

The Department has eighteen research faculty and two instructors and offers B.S., M.S., and Ph.D. degrees. The Department is associated with the Cognitive and Decision Sciences Institute, the Computational Science Institute, the Computational Intelligence Research Laboratory, and the Software Engineering Research Center. More information about the department, its programs and faculty can be found at: http://www.cs.uoregon.edu. The University of Oregon is an AAU research university located in Eugene, a community rated among the most livable in the nation.

The University of Oregon is an Equal Opportunity/Affirmative Action institution committed to cultural diversity and compliance with the Americans with Disabilities Act.

University of Pennsylvania
Department of Computer and Information Science
Lecturer (Lab Instructor) Position

The University of Pennsylvania invites applicants for the position of Lecturer (Lab Instructor) in Computer Science, to start July 1, 2001. The position is for one year and is renewable annually up to three years.

Position Description: Support programming projects for CSE330 (Database Management Systems), CSE350 (Software Design/Engineering), CSE380 (Introduction to Operating Systems), and CSE480 (Distributed Systems). This includes acting as a resource in design of programming projects, acting as liaison with the Technical Staff, assisting Teaching Assistants in the grading of programming assignments, and assisting students in using the software through how-to lectures and office hours.

Position Requirements: Masters Degree in Computer Science or related field is preferred for this position, in addition to the following skills: (a) SysAdmin experience managing any version of Unix (e.g. Solaris, BSD, Linux, etc.), experience with NT is a plus; (b) experienced C programmer (socket, thread and signal programming, and kernel hacking are pluses); (c) database management (Oracle is preferred; knowing MySQL is a plus); (d)

Professional Opportunities

experience with PHP, ASP, ColdFusion or CGI scripting; and (e) knowledge of, or willingness to learn, at least one language such as Java or ML. Applicants must have good people skills in addition to software management skills. Successful applicants will find Penn to be a stimulating environment conducive to professional growth. Ground breaking recently took place on a new $15 Million Computer Science Building. The Department of Computer and Information Science has embarked on a strategic plan to add a significant number of tenure-track faculty over the next five years. We seek to expand and broaden both the applied and theoretical sides of our research and teaching program, building on existing strengths in algorithms and computational biology, computer graphics and animation, computer vision and robotics, databases, logic and computation, natural language processing, networks and distributed systems, programming languages, and real time systems.

The University of Pennsylvania is an Ivy League University located near the center of Philadelphia, the 5th largest city in the US. Within walking distance of each other are its Schools of Arts and Sciences, Engineering, Medicine, Nursing, Law, Business and Fine Arts. The University campus and its surroundings in Philadelphia benefit from a rich diversity of cultural opportunities as well as attractive urban and suburban residential neighborhoods.

To apply, please complete the form located on the Faculty Recruitment Web Site at: www.cis.upenn.edu/positions/faculty_application.html.

Electronic applications are strongly preferred, but hard-copy applications (including the names of at least four references) may alternatively be sent to:

Chair, Lecturer (Lab) Search Committee
Department of Computer and Information Science
School of Engineering and Applied Science
University of Pennsylvania
Philadelphia, PA 19104-6389

Applications should be received by April 1, 2001 to be assured full consideration. Applications will be accepted until positions are filled. Questions can be addressed to: faculty-search@central.cis.upenn.edu.

The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.

University of Richmond

Mathematics & Computer Science Department

Applications are invited for two tenure track positions beginning Fall 2001. Appointments are expected to be at the Assistant Professor level, but rank will be determined by appropriate experience. A Ph.D. in Computer Science is required. Candidates should have a commitment to excellence in undergraduate teaching together with the ability to maintain an active research program, preferably involving undergraduate students.

The University of Richmond is a predominately undergraduate, highly selective, private institution enrolling 3,500 students in schools of Arts and Sciences, Business, Leadership Studies, Law, and Continuing Studies. The Mathematics and Computer Science Department consistently attracts high-quality majors; math or cs majors have won the award for best student research project at four of the last five annual UR Student Symposia.

Applicants should provide a current curriculum vitae, a statement detailing teaching philosophy and research interests, and copies of graduate and undergraduate transcripts to

Dr. Lewis Barnett
Math & CS Dept.
University of Richmond, VA 23173

Applicants should also arrange for three letters of recommendation to be sent to Dr. Barnett. Electronic submissions are acceptable in Postscript, PDF, or common word processor formats. (Send to lbarnett@richmond.edu)

Additional information may be found on the Web at: http://www.mathcs.richmond.edu/csjobs/

Consideration of completed applications will begin immediately and continue until the positions are filled. The University of Richmond is an Equal Opportunity Employer. Women and minorities are especially encouraged to apply.

University of Rochester

Department of Computer Science

The Computer Science Department at the University of Rochester invites applications for tenure-track positions. Candidates at the Assistant Professor level must have received, or be about to receive, a doctorate in Computer Science or a related discipline, and must demonstrate exceptional potential for both research and teaching. Candidates at more senior levels must possess an outstanding record of scholarly achievement. Research interests in all areas of computer science will be considered, but we are particularly interested in databases, algorithms, networking, and computer graphics/multimedia.

Our department is small (13 faculty), with a strong record of research publication and external funding. We offer an outstanding research environment, with excellent students and facilities, and an unusually close-knit and collegial atmosphere. Current research interests include artificial intelligence (vision/robotics/virtual reality, natural language/knowledge representation), systems (compilers, operating systems and runtime environments, computer architecture, and mobile computing), and theory of computation (algorithms, bioinformatics, computational complexity, data mining, DNA-based computation). Total enrollment in the Ph.D. program is approximately 40 students. Further information can be found at: http://www.cs.rochester.edu.

Applicants should send a curriculum vitae, copies of relevant papers, and the names and addresses of at least three references to:

Faculty Recruiting Committee Department of Computer Science University of Rochester Rochester, NY 14627-0226

The University of Rochester is an Equal Opportunity employer; women and members of minority groups are strongly encouraged to apply.

University of Saskatchewan

Department of Computer Science

Our Department has arguably the best climate in Canada. The friendly and supportive environment, combined with our excellent research reputation, makes the Department an ideal place to launch a successful academic career. With substantial growth planned, applications are invited for tenure-track faculty positions at the Assistant or Associate Professor level to start July 1, 2001. We are interested in outstanding candidates from all areas, but especially databases, software engineering, bioinformatics, networks, hardware, and human-computer interaction. Applicants must have a Ph.D. in computer science or equivalent.

Located in Saskatoon, known as Canada's best place to raise a family, the University of Saskatchewan is a major Western Canadian university with approximately 18,000 students. Our Department offers graduate programs at the M.Sc. and Ph.D. levels. See http://www.cs.usask.ca.

Send curriculum vitae and the names and addresses of three references to:

Professor Jim Greer, Head
Department of Computer Science
57 Campus Drive
University of Saskatchewan
Saskatoon, SK S7N 5A9
Canada
greer@cs.usask.ca

Applicants, regardless of their immigration status, can apply until all positions are filled. Members of Employment Equity Groups (women, aboriginal people, people with disabilities, and visible minorities) are encouraged to self-identify. Special efforts will be made to assist with locating positions for spouses.

University of South Carolina

Department of Computer Science and Engineering

Faculty Positions

Applications are invited for tenure-track positions at all levels. Candidates should have a doctorate in computer science, computer engineering, or a related discipline. Candidates for Assistant Professor positions are expected to have strong research potential as well as an interest in teaching at both the undergraduate and graduate level. Candidates for positions above Assistant Professor must possess an exceptional research record. Candidates from disciplines outside computer science or engineering must show an ability to contribute directly to the research and teaching mission of the Department. New faculty will receive strong support from the Department as they embark on their professional careers.

The Department of Computer Science and Engineering is in the College of Engineering and Information Technology and offers BE, BS, ME, MS, and Ph.D. degrees to about 700 undergraduate majors and 225 graduate students. The University of South Carolina is located in South Carolina's capital and technology center and is the comprehensive graduate institution in the state, with an enrollment of more than 26,000 students. For more information, see http://www.cse.sc.edu.

Applicants should submit a curriculum vitae along with the names and addresses of three references to:

Chair, Faculty Search Committee
Department of Computer Science and Engineering
University of South Carolina
Columbia, SC 29208

Electronic applications should be sent to: search@cse.sc.edu.

Applicants will be accepted until positions are filled.

Foreign nationals should indicate current US immigration status.

The University of South Carolina is an affirmative action/equal opportunity employer.

University of Tennessee

Knoxville Department of Computer Science

The Department of Computer Science seeks to fill a tenure-track faculty position at the rank of Assistant Professor or Associate Professor beginning Fall 2001. Applicants must have a doctoral degree in Computer Science or a related area. Applicants must have a strong interest in research. Although preference will be given to research areas that complement the department's existing programs, applicants with research interests in any major field in computer science will be considered.

The Department has numerous, fully networked workstations (SUN, IBM, SGI, DEC, DELL) for students and faculty. In addition, the department has parallel computers of various architectures available in-house, as well as several clusters of high-performance workstations and Pentium processors connected via high speed communications. NSF has awarded the department a $2 million grant to establish a campus-wide computational grid for research on middleware and applications. The department is or has been a member of several national consortia including the NSF Science and Technology Center for Research in Parallel Computing, the DOE Partnership in Computational Science, and NSF's National Partnership for Advanced Computational Infrastructure. Faculty members collaborate with scientists at the Oak Ridge National Laboratory and have access to their facilities.

Please respond to: search@cs.utk.edu. The mailing address is:

Search Coordinator
Department of Computer Science
203 Claxton Complex
1122 Volunteer Blvd.
The University of Tennessee
Knoxville, TN 37996-3450

Additional information about the department is available from URL: http://www.cs.utk.edu. Position will remain open until an acceptable candidate is found.

UTK is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

University of Texas at Arlington

Computer Science and Engineering Department

Multiple tenure-track faculty positions The University of Texas at Arlington (UTA), Computer Science and Engineering (CSE) Department - CSE@UTA invites applications for multiple tenure-track faculty positions at assistant or associate professor levels. Applicants with expertise in the following areas are preferred: software engineering; systems including architecture, distributed and high-performance computing; networks and telecommunications; database and data mining; and applied theory. UTA, part of The University of Texas System, is located in the heart of the rapidly growing Dallas/Fort Worth area, one of the nation's largest high-technology regions, with a flourishing industrial base and excellent opportunities for industry/university collaboration.

We at CSE@UTA are committed to excellence in research, teaching, and community service. We recently kicked off a "Top 25 Initiative" with the goal of reaching a national top 25 ranking. The initiative is strongly supported by all CSE@UTA stakeholders including the UTA administration, our students and alumni, and our industry partners. The highlights of the Top 25 Initiative include significant increase in tenure track faculty positions and PhD students; significant increase in research funds; and establishment of endowed student fellowships, endowed faculty chairs, and industry-sponsored laboratories.

Applicants for an assistant professor position must have an earned doctorate in computer science, computer engineering, or closely related fields and a commitment to teaching and scholarly research. Applicants for an associate professor position must have demonstrated an excellent record of professional accomplishments in their field of expertise. The faculty openings are anticipated for September 2001. Screening of applications will begin immediately and will continue until all positions are filled. Interested persons should send a resume and reference letters to:

Chair of Search Committee
Department of Computer Science and Engineering
P.O. Box 19015
Arlington, TX 76019-0015
Phone: 817-272-3605
FAX: 817-272-3070
Email: search@cse.uta.edu.
http://www-cse.uta.edu.

The University of Texas at Arlington is an Equal Opportunity/Affirmative Action Employer.

The University of Tulsa

Computer Science Department

The University of Tulsa invites applications for tenure track positions in Computer Science beginning in Fall 2001 or January 2002. Minimum qualifications are a Ph.D. in Computer Science, and a strong commitment to teaching and research. Responsibilities include teaching at the undergraduate and graduate levels, continuing scholarly activity, and pursuit of external funding. Candidates with research specialties in information security, software engineering, distributed systems, computer networking and telecommunications are particularly encouraged to apply. The department offers B.S., M.S. and Ph.D. degrees in Computer Science with approximately 100 undergraduate and 50 graduate students. The B.S. degree is accredited by the CSAB. Students in the department are highly motivated, having won a number of Goldwater Scholarships, NSF and DOD graduate fellowships and a Truman Fellowship. Current faculty have active research programs in computer and information security, software engineering, artificial intelligence, evolutionary computation and computational science. Funding agencies include NSF, NSA, DOD and DOE. The University of Tulsa, the oldest private university in Oklahoma, is located in a metropolitan area of 750,000 with 3000 undergraduate and 1200 graduate and professional students. The University's endowment and trust funds total over $600 million. The computer science programs reside in the College of Engineering and Natural Sciences with access to excellent computer-based teaching laboratories and smart classrooms. Applications will be evaluated beginning April 1, 2001 and will be accepted until the position is filled. Send vitae, and names of at least three references to:

Computer Science Search Committee
University of Tulsa
600 S. College
Tulsa, OK 74104-3189
(email: coberly@utulsa.edu)

The University of Tulsa, an equal opportunity/affirmative action employer, is committed to diversifying its faculty and staff. Members of under-represented groups (people of color, people with disabilities, women, veterans, etc.) are strongly urged to apply.

University of Washington, Bothell

Computing and Software Systems http://www.bothell.washington.edu/CSS

Assistant, Associate & Full Professor Positions

The Computing & Software Systems (CSS), an innovative and growing computer science program at the University of Washington, Bothell (UWB) has multiple openings for tenure-track faculty. Candidates will have a doctorate (required prior to date of appointment) in a relevant field. Well-qualified candidates in all related areas are encouraged to apply. For more information please refer to our full advertisement at http://www.washington.edu/admin/eoo/ads/css1.nov15-ouf.0.html. To apply, please send a cover letter, statement of teaching philosophy, statement of research interests, and vita. Also, please arrange for three letters of reference to be sent to

Janet McDaniel
Coordinator
CSS Search Committee
University of Washington, Bothell
Campus mail: Box 358534
18115 Campus Way NE
Bothell, WA 98011-8246

The University of Washington is building a culturally diverse faculty and strongly encourages applications from female and minority candidates. Positions will remain open until they are filled. The University of Washington is an Equal Opportunity/ Affirmative Action Employer.

Virginia Military Institute

Department of Mathematics and Computer Science

The Department of Mathematics and Computer Science at Virginia Military Institute invites applications for a tenure track position in computer science at the Assistant/Associate Professor level to begin 1 August 2001. A Ph.D. in computer science or a closely related field is required. Candidates should have demonstrated excellence in teaching and an ongoing program of scholarly activity. Candidates are expected to have a strong interest in undergraduate teaching and a desire to involve undergraduate students in research. The successful candidate will teach a wide variety of undergraduate computer science courses. The ability to teach some math would be considered a plus. Faculty members are expected to participate in advising and committee work. Members of the faculty wear uniforms and adhere to military customs, but military experience is not required. Applicants should submit a letter stating their professional goals and teaching interests, curriculum vitae, official transcripts, and three letters of recommendation to:

Michael J. Tierney, Chair
Department of Mathematics and Computer Science
Virginia Military Institute
Lexington, VA 24450

At least one of the letters must address teaching effectiveness. Applications will be

(continued)

CRA Welcomes New Staff Members

CRA is very pleased to welcome Diane Long, Jennifer Rubenstein, and Donnajean Ward to the CRA staff.

(l to r) Jennifer Rubenstein, Coordinator of Women's Programs; Diane Long, Administrator; and Donnajean Ward, Director of Programs.

Diane Long, Administrator, brings to CRA valuable experience gained at AAAS/Science Magazine and the American Geophysical Union. As a Manuscript Tracking Assistant at AAAS/Science she was responsible for a range of activities, including liaison between editors, soliciting manuscript referees, assisting contributors, and customer service. Most recently, Diane was an Editor's Assistant at the American Geophysical Union where she assisted with various publications produced by AGU. A native Washingtonian, Diane enjoys rollerblading, reading, and spending time with her nephews in her spare time.

Jennifer Rubenstein joins CRA as Coordinator of Women's Programs. As an undergraduate she studied journalism and women's studies at California State University, Sacramento, with a focus on women working in the communications field. She did some graduate-level coursework in nonprofit management at CSU Hayward. She brings 11 years experience working in nonprofit organizations and associations, most recently as a program coordinator with the Public Health Institute's program titled Children's Environmental Health Network. Born and raised in California, Jennifer re-located in June 2000 to the Washington, DC area. She teaches swing and country western dancing on the side for fun.

Donnajean Ward, Director of Programs, comes to CRA from the Federal Communications Commission where for the past seven years she worked as a policy analyst, chiefly in the areas of cable television and satellites. She has an undergraduate degree in English from the University of Michigan, and a Master's Degree in Radio, Television and Film plus a Certificate in Telecommunications Science, Management, and Policy from Northwestern University. Donnajean spends a lot of her free time in the dark. A big movie fan, she often sees two or three movies in a week. ■

Mentoring from Page 3

graduate student development, personal/emotional boundaries, and a clear track record of effective mentoring elsewhere? Good selection is 90 percent of the battle.

3. *Attention to Faculty Training*: Leaders in mentor-focused graduate programs understand that new faculty are well served by explicit training in how to be a mentor. Relevant training topics include normal graduate student development, the nature of mentoring in academia, important mentor behaviors and functions, managing conflict with students, and ethical decision making in the context of student-faculty relationships.
4. *Supervision of Junior Faculty*: Good junior faculty members often become excellent mentors when seasoned colleagues are available for consultation. Excellent graduate programs are careful to assign new faculty members to senior mentors of their own. Whether in-house or external to the department, senior mentors can offer consultation in structuring relationships with students and offer immediate assistance when problems arise. Such an arrangement also allows the program to evaluate a new faculty member's competence to mentor independently.

For some additional recommendations, visit the University of Washington's web page on "Re-envisioning the Ph.D." [http://depts.washington.edu/envision].

References:

Kram, K. E. (1985). *Mentoring at Work: Developmental Relationships in Organizational Life*. Glenview, ILL: Scott Foresman.

Johnson, W. B., & Nelson, N. (1999). "Mentoring Relationships in Graduate Education: Some Ethical Concerns. *Ethics and Behavior*, 9, 189-210.

Ragins, B. R., & Cotton, J. L. (1999). "Mentor Functions and Outcomes: A Comparison of Men and Women in Formal and Informal Mentoring Relationships." *Journal of Applied Psychology*, 84, 529-550.

Roche, G. R. (1979). "Much Ado About Mentors." *Harvard Business Review*, 57, 14-28.

W. Brad Johnson, Ph.D., is assistant professor of psychology in the Department of Leadership, Ethics & Law, United States Naval Academy, Annapolis, MD 21402. ■

Washington from Page 1

the Science Committee into a significant force within the Congress and, with that momentum, I want to ensure that we have a healthy, sustainable and productive R&D establishment—one that educates students, increases human knowledge, strengthens U.S. competitiveness and contributes to the well-being of the nation and the world."

He also said that he intends to focus on three areas in the early months of his term—science and math education, energy policy, and the environment—without neglecting research funding policy and the health of the research enterprise itself. Boehlert stated unequivocally that he will fight to increase research funding, but that he wants to ensure funds will be used wisely. As he put it, he will be the science community's "staunchest ally and fairest critic." ■

Expanding Pipeline from Page 4

effort to further advance scientific awareness and education.

A beta version of the CD-Rom is now available. Write to Rozeanne Steckler, steckler@sdsc.edu for a copy or for additional information. Comments on this version will be incorporated into a final CD-Rom, to be distributed at the 2001 annual meeting of the National Science Teachers Association. ■

Nicole Batchelor is a student intern in the External Relations group at the San Diego Supercomputer Center. She has written numerous articles on scientific research and education for the center's biweekly newsletter, Online, and quarterly science magazine, EnVision. She is pursuing a communications degree from UC San Diego and is currently enjoying a semester abroad at the Sorbonne in Paris..

Professional from Page 19

accepted until the position is filled. Salary is extremely competitive.

VMI is a public, four-year, undergraduate military college (1300 students) located in the historic Shenandoah Valley of Virginia; Lexington (population 7,000) also home to Washington and Lee University, offers a stimulating cultural atmosphere, a relaxed rural pace, and a diverse economic base to make life both pleasant and rewarding. Share in Lexington's rich heritage, while enjoying the natural beauty of the Blue Ridge.

VMI is an AA/EEO employer.

Washington State University

School of Electrical Engineering and Computer Science

Looking for a career in a research university with a very high quality of living? Washington State University in Pullman offers a great opportunity to live in a small town with a strong sense of community, excellent schools, and abundant outdoor recreation nearby, while working with a team of excellent researchers.

The School of Electrical Engineering and Computer Science (EECS) invites applications for several positions to be filled in Computer Science. The school is interested in all areas, especially in systems research. Particular areas of interest include databases/data mining, software engineering, networking/distributed systems, and internet technologies/e-commerce; but outstanding candidates in other areas are encouraged to apply and will be seriously considered. Refer to www.eecs.wsu.edu/search/ for a complete list of areas and for more details about WSU and the open positions.

Screening of applications will begin immediately upon receipt of curriculum vitae. Maximum consideration will be given to applications received by January 10, 2001. Applicants should send a cover letter that includes a summary of their research and teaching interests, a curriculum vitae, and the names and addresses of three references to:

Chair, Computer Science Search Committee
School of Electrical Engineering and Computer Science
Washington State University
PO Box 642752
Pullman, WA 99164-2752.

WSU is an EO/AA educator and employer.

CRA Officers at Recent Board Meeting

Pictured above in Arlington, VA, (l to r): Leah Jamieson, Purdue (secretary); Jim Foley, Georgia Tech (treasurer and chair-elect); Mary Lou Soffa, University of Pittsburgh (vice chair); and Ed Lazowska, University of Washington (chair).