COMPUTING RESEARCH NEWS

Computing Research Association, Celebrating 30 Years of Service to the Computing Research Community

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President's Budget, House Budget Resolution Help Expose 'Lay of the Land'

News Analysis

By Peter Harsha

With the passage of the House Budget Resolution on March 22—a resolution endorsing a significant increase in funding for the National Science Foundation (NSF) for FY 2003—Congress has cleared the second hurdle in the year-long race to set the budgets for federal agencies for the upcoming fiscal year. Although the process, begun on February 4 with the release of the President's Budget Request for FY 2003 and detailed in this space last issue (*CRN* Vol. 14/No. 2, March 2002), is still in its earliest stages, it is not too soon to assess how it is taking shape and determine what that might mean for computing research in the coming year.

Upon its release, the President's budget request earned less-than-glowing reviews from many in the scientific community. In its annual review of the President's research and development budget request, the American Association for the Advancement of Science (AAAS) noted that while total federal R&D would increase substantially in FY 2003 to a record $112.0 billion, $8.9 billion or 8.6 percent more than FY 2002, the proposed funding increases would go almost entirely to the Department of Defense (DOD) and the National Institutes of Health (NIH). Funding levels at other federal research agencies would see only slight increases, remain flat, or decline.

CRA's own review of computing research funding in the President's FY 2003 budget request was equally unenthusiastic, noting only slight increases in overall federal support for the multi-agency Networking and Information Technology Research and Development (NITRD) initiative. Funding for NITRD in FY 2003 would increase only 2.5 percent under the President's plan, with the largest increases—both in total dollars and percentage increase—slated for NIH and the National Aeronautics and Space Administration (NASA) and flat or declining budgets for every other NITRD agency.

CRA's analysis also noted that the President's request falls well short of the funding level recommended by the President's Information Technology Advisory Committee (PITAC). This congressionally chartered, presidentially appointed committee of IT professionals in industry and academia was charged with examining the federal role in supporting basic IT research and development. PITAC noted that the Nation has had a "spectacular" return on the federal investment in IT, but found that the current level of investment was inadequate. They concluded in their 1999 report, *Information Technology Research: Investing in Our Future*, that "the Nation is gravely underinvesting in the long-term, high-risk research that can replenish the reservoir of ideas that will lead to innovations in information technology in generations to come."

As a remedy, PITAC included a series of funding-level recommendations in specific IT research areas for the five-year period 2000-04. While PITAC's findings were generally well received in Congress and in the White House, funding for the NITRD program has never matched the PITAC-recommended levels. This year, the President's request falls more than $610 million short of the PITAC target. (For a complete look at CRA's analysis of computing research in the FY 2003 Budget Request, see the CRA Government Affairs website at: http://www.cra.org/govaffairs.)

Aside from the overall funding levels contained in the President's request, those in the physical sciences were especially disheartened by what they perceive as a growing imbalance in the way the federal R&D portfolio is managed. Under the President's

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Taylor and van Dam Win CRA Service Awards

Valerie Taylor, Northwestern University, and Andries van Dam, Brown University, are the winners of CRA's two service awards for 2002. Taylor will receive the A. Nico Habermann Award; van Dam the Distinguished Service Award. Both will be presented on the evening of July 15 at CRA's Conference at Snowbird.

CRA presents these two awards, usually annually, to individuals for outstanding service to the computing research community. The A. Nico Habermann Award honors the late A. Nico Habermann, former head of NSF's Computer and Information Science and Engineering Directorate. This award is given to an individual who has played a leadership role in aiding members of underrepresented groups within the computing research community. It recognizes work in areas of government affairs, educational programs, professional societies, and public awareness. The Distinguished Service Award recognizes service in the areas of government affairs, professional societies, publications, or conferences, and leadership that has a major impact on computing research.

Valerie Taylor

CRA A. Nico Habermann Award

Valerie Taylor is an Associate Professor in the ECE Department at Northwestern University. As co-chair of the Coalition to Diversify Computing (CDC), Valerie has worked to make it a vibrant organization. Her leadership helped to make the first Richard Tapia Symposium to Celebrate Diversity in Computing a major success through her efforts and tireless determination. She has organized the Distributed Rap Sessions project for minority graduate students using the Access Grid, and initiated a new CDC membership drive that has attracted several young minority Ph.Ds.

Andries van Dam

Taylor has been an active member of the Grace Murray Hopper Conference since its beginning, serving as program chair in 2000 and as general

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Expanding the Pipeline

A Summary of Results from the Survey of the Earned Doctorate: Women Earning Computer Science Doctorates

By Barbara M. Moskal

This is a shorter version of an article that will appear in the June 2002 issue of the ACM SIGCSE Bulletin, **inroads***, which focuses on women in computing. The issue is edited by Tracy Camp, Colorado School of Mines.*

Introduction

As new doctorates complete their degrees in U.S. academic institutions, they are asked to respond to the *Survey of Earned Doctorates* (SED), an instrument that is designed to collect self-report information concerning graduate school experiences and future employment. The SED seeks to be a census of all doctoral recipients in the United States. The survey is sponsored by the National Science Foundation, the National Institutes of Health, the U.S. Department of Education, the National Endowment for Humanities, the U.S. Department of Agriculture, and the National Aeronautics and Space Administration. Copies of the specific questions that appear on the SED are available in the appendices of the yearly final reports (Sanderson, Dugoni, Hoffer, & Myers, 2000; Sanderson, Dugoni, Hoffer & Selfa, 1999; Sanderson & Dugoni, 1998). Detailed reports and statistical tables concerning science and engineering can also be found in a separate series of reports (Hill, 2001a; 2000b; 2000; 1999; 1997; NSF, 1996; 1995).

This paper summarizes the results of an analysis of a subset of data that was collected through the SED. The focus of this paper is on women who completed doctorate degrees in computer science between the academic years 1990-91 and 1999-2000. A more extensive version of this report that includes both the methodology and statistical summaries is available at Moskal (2002). Although computer science doctorates are defined here to include doctorates in information science (WebCASPAR, 2001), prior research (Camp, 1997) suggests that the percentage of women completing doctorates in information science is low compared with computer science. This article is divided into the following subsections: National Trends in Doctorate Degrees, Experiences Completing the Doctorate, Experiences After the Doctorate, and Conclusions.

National Trends in Doctorate Degrees

Between the academic years 1990-91 and 1999-2000, the percentage of degrees awarded to women in computer science, science and engineering, and all degrees has increased from 14.63% to 16.49%, 28.86% to 36.17%, and 36.96% to 43.80%, respectively. This results in a ten-year rate of increase of 12.77% for computer science, 25.34% for science and engineering, and 18.51% for all degrees. If these rates of increase continue on a per-year basis, women will reach parity with men with respect to earned doctorates in science and engineering by 2012-13 and across all fields by 2007-08. In computer science, parity with men will not be reached until the academic year 2087-88—more than 80 years from now.

Within science and engineering and across all fields, the increase throughout the ten years of interest has been steady. The trend in the percentage of computer science degrees that were awarded to women is far less consistent, displaying both increases and decreases during this period. Given the consistent increase in science and engineering degrees and all degrees awarded to women, it is reasonable to assume a continued, consistent increase in the next several years in these areas. Since the awarding of computer science degrees has displayed no clear trend, the assumption made here of a steady increase in the years to come is optimistic. Based on a trend that began in 1997-98, a decrease in the near future is more likely.

The next statistic concerns women who are U.S. citizens or permanent residents. Over the same ten-year period, there was a consistent increase in the percentage of science and engineering (35.17% to 41.69%) and all doctorate (43.08% to 48.89%) degrees that were awarded to women. The rate of increase for this period across science and engineering and across all fields is approximately 18.54% and 13.48%, respectively. The trend in the percentage of female U.S. citizens or permanent residents to receive doctorate degrees in computer science has been far less consistent, and displayed a 9.91% decrease across the ten-year period (20.84% to 18.78%). If these trends continue, women who are U.S. citizens or permanent residents and who receive doctorates in science and engineering and across all fields will reach parity with men in 2009-10 and 2001-02, respectively. For women who are U.S. citizens or permanent residents, parity with men in the attainment of doctorate degrees in computer science is not anticipated.

Experiences Completing the Doctorate

Overall, women spent more time enrolled in graduate school than did men over the ten-year period of interest. The mean difference between these values ranged from 0.4 to 1.4 years. The median time enrolled for women was greater than that of men for all but one academic year, 1995-96. During the 1995-96 academic year, men and women both had a median of 7.2 years invested in their graduate education. The median additional time required for women across the ten-year span ranged from 0 to 1.3 years.

While completing a graduate education, students require financial support for both living and educational expenses. One question on the SED asks respondents to indicate their primary source of financial support during their graduate education. Women were more likely than men to rely on personal funds (e.g., savings, personal loans and family support) (female, male difference: 7.03%) as their primary source of support. Women were also more likely to report fellowships, scholarships, or dissertation grants as their primary source of support than were men (female, male difference: 2.38%). Men, on the other hand, were more likely than were women to rely on research assistantships, trainingships, or internships as their primary source of support (male, female difference: 9.65%).

Similar results emerged when the data were restricted to U.S. citizens or permanent residents. Across the ten years, women were more likely than were men to rely upon personal funds as their primary source of support (female, male difference: 6.16%). Women were also more likely to rely on fellowships, scholarships, or dissertation grants as their primary source of support, compared with men. This difference, however, was slight (female, male difference: 1.47%). Men continued to report research assistantships, trainingships, and internships as a primary source of funding at a higher rate than did women (male, female difference: 10.83%). One notable difference from the previous results is that women who are U.S. citizens or permanent residents were slightly more likely to rely on teaching assistantships for their primary source of support than were their male peers (female, male difference of 1.91%).

Experiences After Completing the Doctorate

The next set of statistics addresses what male and female computer science doctorates did after completing their degrees. Individuals with unknown plans accounted for less than 10% of respondents and were eliminated from further analysis. Across the ten-year period, the majority of women (88.97%) and men (86.18%) had definite plans within the United States. Individuals who indicated that they had definite plans within the United States were asked to indicate whether these plans were to continue study or to become employed. The majority of these individuals indicated that they would become employed.

Survey Results
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Computing is Changing—and so is CRA

By Jim Foley, CRA Board Chair

We all know how dramatically and rapidly computing is changing. Moore's law. Metcalfe's Law. Disk capacity cost per byte decreases at least as fast as Moore's law. We have gone from one computer for many users, to one computer per user, to many computers per person. I just counted 48 microprocessors in my home, ranging from the three thermostats and range and washer up to the Macintosh Cube and G4 Powerbook. That totals 24 for my wife and 24 for me. New cars have dozens of chips. Last year, about 200M PC chips and 8.5B embedded chips were sold. We are ubiquitous, we are off the desktop, we are embedded. We are wired. We all know this.

Less well known are the ways in which CRA has been changing and evolving. The organization was originally founded in 1972 as the Computer Science Board. In 1986, we became the Computing Research Board—in recognition of increasing activity in computer research in fields beyond computer science. To further emphasize our embracing of the many different facets of computing research, our name was changed in 1990 to the Computing Research Association.

The change from a name containing *computer science* to a name containing *computing* is ripe with significance, and was certainly responsive to new emphases in the '80s on areas such as computational science and human-computer interaction. CRA has always been concerned about human resources. Many of us recall the Denning CACM "Eating our Seed Corn" article of 1981—driven by data from our Taulbee survey—that predicted a decrease in production of Ph.Ds because so many new Ph.D. graduates were going to industry rather than to academia.

In 1990, the CRA Women's committee (CRA-W) was formed to help bring more women into computing research, and to provide a support network for those already in academics. More recently, when dramatic shortages in the Information Technology workforce were developing, CRA prepared the widely referenced IT Workforce Study that described the nature of the workforce and the areas of shortage [Peter Freeman and William Aspray, *The Supply of Information Technology Workers in the United States*, 1999].

Another dimension of change in CRA is the effort to define our constituency more broadly. Our organizational members include the Society for Industrial and Applied Mathematics (SIAM) and USENIX, along with ACM, IEEE-CS, AAAI, and our new Canadian affiliate, CACS/AIC. We have worked with the Electrical and Computer Engineering Department Heads' Association (ECEDHA, formerly the NEEDHA, National Electrical Engineering Department Heads Association) to improve communications and ensure that CRA's Conference at Snowbird includes topics of interest to computer engineering department heads. In the Information Technology arena, CRA has hosted and supported the new IT Deans group (initiated by Peter Freeman, now chaired by Bobby Schnabel) that includes more than 40 participating institutions. As well, Bobby Schabel chaired a special task force to examine how CRA can embrace the new academic structures, such as IT schools. Future CRA articles will tell you more about the IT Deans and the Academic Structures Task Force.

What's the bottom line here? Simple. CRA is constantly changing and responding to new needs and opportunities, just as computing in general is doing. But, there's another aspect as well. Each of the changes has occurred because one or several members of the CRA board have taken the initiative to make something happen, to address an issue, to lead a study, to make and execute recommendations. We owe each of them a "thank you." And we look to current and future board members to be similarly innovative and creative in addressing future needs and opportunities. Finally, we welcome ideas and suggestions from the computing research community to help us continue to change and adapt. ∎

CRA's IT Deans Group Participants

Brigham Young University, Utah
Brigham Young University, Hawaii
Carnegie Mellon University
Cornell University
Dalhousie University
DePaul University
Drexel University
Florida State University
Georgia Institute of Technology
Georgia Southern University
Illinois State University
Indiana University
Keio University, Japan
Long Island University
National University Of Singapore
New Jersey Institute of Technology
Northeastern University
Pace University
Rensselaer Polytechnic
Rochester Institute of Technology
Southern Polytechnic State University
State University of NY, Albany
State University of NY, Buffalo
Syracuse University
The Pennsylvania State University
United Arab Emirates University
University at Buffalo
University of Arkansas at Little Rock
University of British Columbia
University of California, Berkeley
University of California, Santa Cruz
University of California, Irvine
University of Central Florida
University of Colorado, Boulder
University of Hawaii
University of Illinois at Urbana-Champaign
University of Iowa
University of Michigan
University of Nevada, Las Vegas
University of North Carolina, Charlotte
University of Pittsburgh
University of South Alabama
University of Utah
University of Washington
Virginia Tech

CRA Seeks New Executive Director

The Computing Research Association is seeking an Executive Director. This is the lead staff position in the organization, reporting to the chairman of the board. The job involves managing approximately 25 programs and a staff of eight, and working with the 32-member board to provide leadership in promoting a vigorous computing research community in North America.

The successful candidate will have many of the following attributes:

- a doctorate in a computing-related discipline.
- familiarity with the policy, human resource, and other non-technical issues facing the computing research community.
- knowledge of the institutions and individuals active in leadership roles in computing research.
- strong analytic and writing skills, and an interest in employing them in writing studies and proposals on behalf of the organization.
- previous management experience in a similar setting, such as service as a dean, department chair, industrial laboratory manager, or manager in a funding agency.
- experience in membership recruitment and retention in a professional organization.

The Computing Research Association is an educational non-profit organization located in Washington, DC. Its mission is to promote research and advanced education in the computing-related disciplines. The work is focused in four areas: public policy; human resource development; community building; and information gathering and dissemination. CRA's members are 200 departments of computer science and other computing-related disciplines; 25 industrial, governmental, and academic computing research laboratories; and six professional computing societies. The organization has an able and experienced staff, strong board of directors, well-established programs, annual budget in excess of $1 million, strong financial reserves, and a stable core membership.

CRA is the premier organization for computing research. Computing research is one of the fastest-growing fields of science and technology. CRA has been actively involved in representing the computing research community in Washington, DC and in encouraging the unprecedented increases seen in federal research funding over the the past several years. CRA has well-established programs for women and other underrepresented groups that are among the most effective in the science and engineering community. Data collected by CRA has been used for departmental management and informing federal policy for 30 years.

The position is full time. The executive director is expected to be an active presence in the Washington office as well as representing the organization to the outside world.

The salary is competitive. A moving allowance will be provided to candidates from outside the Washington, DC area.

People interested in applying should send a resume plus a letter of application. The letter of application should include:

- names and contact information for three references
- salary history
- date of availability

We strongly prefer to receive applications as attachments to electronic mail in either Microsoft Word or PDF format. These electronic submissions should be sent to Ms. Dana Neill, CRA Business Manager, at dneill@cra.org.

Those unable to submit electronically should mail applications to:

CRA Search
Computing Research Association
1100 Seventeenth Street NW
Suite 507
Washington, DC 20036

Applications will be reviewed on a continuing basis upon receipt until the position is filled. CRA is an Equal Opportunity Employer. Women and minority applicants are especially encouraged. ∎

CRA Board Elections and Appointments

Incumbents

Lori A. Clarke, Professor of Computer Science at the University of Massachusetts, is beginning her second term on the board. She has served on the Outstanding Undergraduate Awards Committee, chaired the CRA Academic Careers Workshop, and served as a mentor for the Distributed Mentor Project. She will continue to work on ways to increase participation in computer science graduate education.

Clarke's research has focused on finite-state verification techniques for high assurance software. On the IEEE PUBS board, she worked to develop by-laws that guarantee input by the research community in the selection of EICs for the *Transactions*. As a SIGSOFT executive committee member, she worked to strengthen the SIGSOFT conference program and guidelines. She has been instrumental in building the computer science program at UMASS and in their mentoring program for women.

Professor Clarke, appointed an ACM Fellow in 1998, received a Ph.D. in Computer Science from the University of Colorado.

James D. Foley, Associate Dean, Georgia Institute of Technology, College of Computing, has been a board member since 1996, and currently chairs the CRA board. He previously served as CRA's treasurer, and as a member of the Elections, Industry, and Government Affairs committees. He also co-chaired Snowbird in 1998.

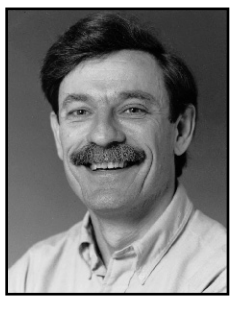
Foley's research interests include computer graphics; information visualization; human-computer interaction; and management of R&D. He previously was director of the Mitsubishi Electric Research Laboratory, and then chairman and CEO of the Mitsubishi Electric Information Technology Center America. He also was the director and then CEO of the Yamacraw Economic Development Initiative for the State of Georgia. Foley is a Fellow of both the IEEE and ACM, and was elected to the SIGCHI Academy in 2001. He received a Ph.D. in Computer, Information and Control Engineering from the University of Michigan.

Kathleen R. McKeown is Professor and Chair of the Computer Science Department at Columbia University. She joined the board in 1999 and currently serves as its secretary and a member of the Executive Committee. She is a member of the External Awards Committee, and for the second time she will co-chair the New Chairs' Workshop at Snowbird 2002. Her interests in CRA include improving the status of computer science nationwide and special programs.

McKeown heads Columbia's Natural Language Group that has recently developed a suite of summarization systems for tracking and summarizing news, and she leads Columbia's digital library project, PERSIVAL. In 2000, she was named Outstanding Woman Scientist by the New York Association of Women in Science. She has been active in the Association for Computational Linguistics and the American Association for Artificial Intelligence, and is an AAAI Fellow. McKeown was awarded a Ph.D. in Computer Science from the University of Pennsylvania.

Daniel A. Reed is Gutgsell Professor, Department of Computer Science, and Director, National Center for Supercomputing Applications (NCSA), University of Illinois at Urbana-Champaign. A board member since 1998 and currently a member of the Executive Committee, he has also chaired both the Awards and the Government Affairs Committees. Reed recognizes a need for the community to act in unison and with vision to shape national policy for computing, and will continue to work to further this goal as a board member.

Reed's research interests include high-performance computing; experimental performance analysis; parallel I/O; resource management; virtual environments; and mobile computing. He currently serves on the State of Illinois VentureTECH Advisory Committee and is a member of the AAAS Section on Information, Computing, and Communication. Previously he was a member of NSF's CISE Advisory Committee. Reed received a Ph.D. in Computer Science from Purdue University.

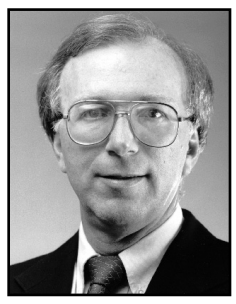


Lawrence Snyder is Professor of Computer Science and Engineering at the University of Washington. A board member since 1996, he has chaired the Elections Committee and has served on the Membership and the Undergraduate Awards Committees. He has co-authored two of CRA's best practices memos—"Evaluating Computer Scientists and Engineers for Promotion and Tenure" and "Commercialization Oversight for Computer Research Departments."

Snyder's research interests include parallel algorithms and models of parallel computation; parallel architectures and interconnection networks; and parallel programming languages and environments. He is currently a member of NRC Army Research Laboratory Technical Assessment Board, and has chaired two NRC advisory committees (on Academic Careers for Experimental Computer Scientists and Engineers, and on Information Technology Literacy). Snyder, a Fellow of both the IEEE and the ACM, earned a Ph.D. in Computer Science from Carnegie Mellon University.

Mary Lou Soffa, Professor of Computer Science at the University of Pittsburgh, is beginning her third term as a board member. She has served as vice chair and as a member of the Executive Committee, and she currently co-chairs the CRA women's committee (CRA-W). She organized workshops on mentoring at Snowbird '98 and on recruitment and retention of women and minorities at Snowbird 2000. Soffa believes that CRA's committees and programs provide the mechanisms for tackling important problems, such as promoting computing research to government agencies and organizations and in addressing the critical issue of recruiting and retaining young research talent.

Soffa's research interests focus on the development of code improving transformations and the design of program analyses for compilers and software engineering tools. In 1999 she was awarded the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring, and was also elected an ACM Fellow. She has been active in ACM, and currently serves as associate editor for several professional journals. Professor Soffa was awarded a Ph.D. in Computer Science from the University of Pittsburgh.



John A. Stankovic is BP America Professor and Chair of the Department of Computer Science at the University of Virginia. He is currently CRA's treasurer and a member of the Executive Committee. He also chairs the Faculty Recruitment and Retention Study Group. Past CRA activities include chairing the Electronic Services and Communications Committees and the Distinguished Service and Habermann Awards Committees. He co-chaired Snowbird 2000 and chaired the New Chairs' Workshop at Snowbird '98.

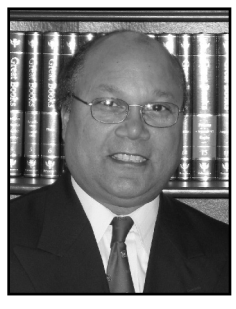
Stankovic's research interests include large-scale embedded systems for pervasive computing; real-time computing; operating systems; distributed computing; and real-time databases. In 2000 he was awarded the IEEE Award for Outstanding Technical Contributions and Leadership in Real-Time Systems—TC on Real-Time Systems. He is a Distinguished Member of the 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*. Stankovic is an ACM Fellow and an IEEE Fellow, and received the IEEE Computer Society's Meritorious Service Award. He received his Ph.D. in Computer Science from Brown University.

Newly Elected

Richard C. Waters is President and CEO of Mitsubishi Electric Research Labs in Cambridge, Mass. Before being elected to the board, he organized the Boston area Lab Directors group for CRA, and has been active in Snowbird conferences as a session chair and program committee member. He hopes to foster supportive discussion between the university and corporate wings of CRA on how to foster significant research in these organizations, in the face of the many competing demands currently placed upon them.

Waters' research interests include artificial intelligence, computer vision applications, speech interfaces, and human computer interaction. Before joining MERL in 1991, he was a Research Scientist and Principal Investigator at the MIT AI Laboratory. He currently serves as President of the John L. and Geraldine R. Weil Memorial Charitable Foundation. Dr. Waters, who is a Senior Member of IEEE, received a Ph.D. in EE&CS from the Massachusetts Institute of Technology.

Appointed



Bryant York is Professor and Research Director in the Computer Science Department at Portland State University. He has been appointed to the board to complete the term of Peter Freeman, which will expire in 2002.

Among his many awards, York recently received the first Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Science. In 1998, he received the CRA A. Nico Habermann Award for outstanding contributions to aiding members of underrepresented groups within the computing research community. York has served on a number of committees at NSF and ACM, and currently serves on the steering committee of the Coalition to Diversify Computing. He received his Ph.D. degree in Computer Science from the University of Massachusetts, Amherst. ▮

The Ph.D. Job Hunt – Helping Students Find the Right Positions

By Edward D. Lazowska

Our reputations—individually and institutionally—are built largely through the accomplishments of our students. What can we, as faculty members and as departments, do to help our students find appropriate positions—positions in which they will succeed and make both themselves and us look good?

The *sine qua non*, of course, is a graduate-student career that demonstrates clear success in research and teaching. (As far as I'm concerned, the skills that make a great teacher and mentor are just as valuable in industry as in academia.) No amount of attention to the "end-game" can compensate for shortcomings in these areas. But there are various things that we can help our students do, in the final year or two of their graduate careers, to increase the likelihood of a happy ending to the job search.

The following ideas are abstracted from a "How to Get a Job" seminar given each year to graduate students in computer science and engineering at the University of Washington. While the material is aimed at students, much of it represents "departmental philosophy," and is thus important to faculty and to chairs as well. And the most critical element of this departmental philosophy has already been stated—that we in universities are in the *people business*, with reputations that are built largely through the accomplishments of our students.

General Principles

We impress on our graduating students the importance of supporting each other rather than competing with each other. Our department produces only about 1 percent of the nation's new Ph.D.s every year. If a student feels the irrepressible urge to compete, then let him or her compete with the other 99 percent. Our own students will need each other's support to succeed. (I still recall fondly how my University of Toronto graduate-school office mate, also on the job market 25 years ago, helped me to get an offer from the University of Washington by bluffing the department chair on my behalf.) UW CSE students embrace this wholeheartedly—discussing strategy, critiquing presentations, and sharing experiences.

We urge students to be strategic about where they apply—this respects their own time and energy, and the time and energy of potential employers. Plus it leaves room for others.

Students must be well-rounded (they should refresh their knowledge of all areas of computer science before heading out on the circuit) and well-informed (about the places they'll be visiting and the people they'll be meeting). They must prepare a *great* talk. And they must make their advisor and the department fulfill their obligations.

Getting—and Sharing—Advice

Students have many resources throughout the process: their advisors, other faculty members (especially young ones, who will have faced the same issues recently), summer internship supervisors, recent graduates of the department, and each other. While the advisor must bear the major responsibility, the entire department is on the hook because the entire department benefits from the success of each student.

Each year our graduating students set up a "job-seekers" bulletin board where they can exchange information throughout the season—information about preparation, interviews, impressions, and offers. Sharing information is valuable in many respects—everyone learns with experience, and even with lots of experience, it's impossible to think of everything and learn everything during one visit. Remember that each individual will have his or her own decision process and criteria—it is the inputs to this process that are being shared.

At the end of the season, we organize a session where that year's graduating students describe their experiences to the next year's crop.

Where to Apply

The choice between industry and academia is a personal one. I tell students to think about how they're most effective at achieving leverage—a multiplicative effect. If it is through designing things that others will use, and through working with peers, then an industrial setting may be best. If it is through mentoring the next generation, then an academic setting may be best.

Within industry, one must choose between research and development. Within academia, one must choose between a research institution and a teaching institution. It is important not to get hung up on titles, rankings, etc. In industry, exciting forefront work can occur at places that don't formally have a "research division." In academia, reputations lag reality; also, even for those with a research bent, a top-tier teaching institution could be much more fun than a lower-tier research institution, since being around smart people is what makes life interesting.

Within a category, it is a bit like applying to college. The student will need to do an honest assessment of himself or herself —with the help of others—and then identify some "eye-level" positions, some "stretch" positions, and some "safeties." Everybody needs to understand that no one's interests—those of the student, advisor, potential employers, or future students—are served by sending a student off on the wrong "circuit." Letters must be detailed, positive, and honest.

It is important for student and advisor alike to understand that even an apparently terrific match is no guarantee of an offer—each institution has only a few positions. In a particular year an institution may have a narrow focus (e.g., on a particular subfield), and there's no accounting for taste. (For all of these reasons, don't take a negative decision personally! The people you meet when interviewing—regardless of the outcome—will be some of your closest colleagues in the early years of your career.)

To get ideas, we tell our students to look at the Computing Research Association website (in particular the "Jobs Service"—but don't fail to apply to a place just because you don't see an ad or you see an ad that focuses on subfields other than your own), our departmental Ph.D. jobs bulletin board (where email regarding positions is posted), and the destinations of recent graduates. We also suggest that students consult with their advisor, with new faculty (most of whom have interviewed widely), with each other, and with recent graduates.

When to Apply

Apply no later than the December holidays—mid-January is too late. The list of places to which the student will apply must be finalized before then, references must be nailed down, and references must see the list of places to which the student will apply. It takes a lot of care and planning on the part of the faculty to help everyone get the job that s/he wants.

In addition to the obvious things, the application should include a two-page statement describing accomplishments and directions in research and teaching. This is a chance to put things in perspective. What sort of person will the employer be hiring? (For academic jobs, there may have been a time when the teaching statement was of secondary importance, but if so, that time has passed!)

Ask your references to send letters directly, whether or not the potential employer requests this. Delayed letters are a major factor in delaying the consideration of a candidate (thus reducing the chance of being interviewed, as slots fill up).

Preparing a Great Talk

We tell students: Iterate with your advisor on both an outline and slides. Go through a dry run with a couple of students and with your advisor; then try it with a larger audience. Include people from outside your subfield—the only way to be sure that your talk works with a general audience. Remember that, while the goal of a conference talk is to inform a specialized audience about a particular research result, the goal of a job talk is to convince a broader audience that you have identified an important and difficult problem, that you have come up with an innovative and effective solution, that you have concrete ideas for a future research agenda, and that you will be a strong contributor to their scholarly community.

Here is the secret weapon: videotape your presentation (our department has owned a video camera for more than a decade for this explicit purpose) and *force yourself to watch the tape*. After you've recovered from the shock, fix the many annoying things that you are bound to have observed.

Rehearse responding to questions—a critically important aspect of the presentation. Beg people at your dry runs to ask more questions, even bizarre questions—you'll get plenty of these on the road, and practice definitely helps. Under questioning, be honest, not glib. If a question points to a flaw in your work or a limitation in your understanding, acknowledge this, promise to follow up, and do so! Practice gracefully disengaging from ratholes—time management is the speaker's responsibility.

Being Well Rounded

Each fall, our graduating students arrange a seminar series in which they bring each other back to the forefront of the entire field.

This provides a tremendous advantage. Each student has been relentlessly focusing on his or her thesis research for several years. What important things have happened in the other areas of computer science since the student took the qualifying courses in these areas? Learning this allows the student to make better use of each interview slot. The student will know the recent developments in each interviewer's field, so it will be possible to spend time talking about the interviewer's own work and possible technical relationships, rather than wasting time on basics or spending the entire time talking about the student's own work.

The Visits

We tell students: Become well-informed about each place you'll be visiting and each person you'll be meeting—consult the web, your advisor, new faculty, and your fellow graduating students.

Develop one-on-one interview skills. A great way to do this is to schedule time with visitors to your own department. This will also increase your visibility. (Some departments offer "mock one-on-one interviews" to prep graduating students.)

Prepare answers to the "standard questions"—What is your research about? (Have 1-minute, 5-minute, and 15-minute versions.) What are you interested in doing next? What questions do you have about this place?

Job Hunt
Continued on Page 11

Adventures in Computational Grids

By Pamela Walatka

Sometimes one supercomputer is not enough. Your local supercomputers may be busy, or not configured for your job; or you may not have any supercomputers. You might be trying to simulate worldwide weather changes, requiring more compute power than you could get from any one machine, or you might be collecting microbiological samples on an island, and need to examine them with a special microscope located on the other side of the continent. These are the times when you need a computational grid.

A computational grid is a network of geographically and often organizationally distributed resources including computers, instruments, and data. A user has single-sign-on access to all the resources on a grid. These resources may be managed by diverse organizations in widespread locations, and shared by researchers from many different institutions. Grid users can establish their identities by getting authentication certificates, obtain accounts on the grid's computational resources, and then use the resources—which are often scattered throughout a continent or beyond—from their desktops.

The idea of computational grids has taken shape over the past few years. The key concepts are described in a book edited by Ian Foster and Carl Kesselman, *The Grid: Blueprint for a Future Computing Infrastructure* (Morgan-Kaufmann, 1999). Foster and Kesselman initiated the Globus project to develop enabling software for grids: infrastructure, services, and application toolkits; Steve Tuecke, Lee Liming, and dozens of developers are responsible for continued improvement. (See www.globus.org for more information.) The ambitious Globus project provides free open-source software for a number of developing grids. While other organizations are developing alternative software, none are as widely used as the Globus toolkit.

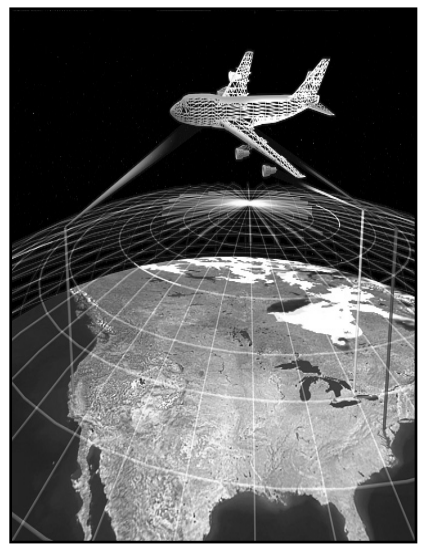
From Dreamware to Testbeds

Computational grids have progressed from dreamware, through trials (and tribulations), to the existence of persistent testbeds with production capabilities. Numerous grid development and operation efforts are now underway. Universities without supercomputers have strung together clusters of workstations to provide their researchers with high-performance resources. Businesses have begun to explore the possibilities in grid computing; For example, Irving Wladawsky-Berger, Vice President, Technology and Strategy, IBM Server Group, calls grid computing the "key to advancing e-business into the future and the next step in the evolution of the Internet towards a true computing platform." (See IBM: Linux To Seed Next Generation Of Grid Computing. CRN, January 30, 2002, and http://www.globus.org/about/news/HPCwire/ibmGridsTransform12-7-01.html.) Wladawsky-Berger predicts that grid computing, like supercomputing before it, will provide a vast infrastructure for e-business.(http://www-1.ibm.com/servers/events/grid.html) Great Britain is developing a grid, and Euroglobus is underway (see http://www.euroglobus.unile.it/). The Global Grid Forum (http://www.gridforum.org/) meets semiannually to consolidate standards for grids.

Eventually there may be one global grid. Currently the three most substantial grids, in terms of compute cycles already provided, persistence, and scope of resources, are:

- The NSF PACI/NCSA Alliace Grid
- The NSF PACI/SDSC NPACI Grid
- The NASA Information Power Grid.

The National Science Foundation PACI Program (http://www.interact.nsf.gov/cise/descriptions.nsf/pd/paci?OpenDocument) sponsors two grids: the National Computational Science Alliance (NCSA) in Urbana-Champaign, Illinois, and the National Partnership for Advanced Computational Infrastructure (NPACI), at the San Diego Supercomputer Center in San Diego, California. These grids provide interconnected high-performance computing systems and powerful instruments, and have pioneered the development, application, and testing of grid infrastructure. For example, Randy Butler's group at NCSA provides the Grid-in-a-Box (http://www.ncsa.uiuc.edu/TechFocus/Projects/NCSA/Grid-in-a-Box.html), which simplifies the grid-building process for Linux systems. Also at NCSA, Doru Marcusiu manages collaborative grid infrastructure development with NASA's IPG and the San Diego part of NPACI. In San Diego, Mary Thomas, Keith Thompson, Steve Mock, and many others have developed a Hot Page for interactive access to their grid.



Representation of NASA's Information Power Grid.
Image by Marco Librero and Cliff Williams.

NASA created the Information Power Grid (IPG)

Grids
Continued on Page 15

CPHC—The UK's Computing Research Organization

By Aline Cumming

Origins

The Conference of Professors and Heads of Computing (CPHC) was constituted in 1993. It was an amalgamation of two established bodies, the Conference of Professors of Computer Science (CPCS) and the Committee of Heads of Computing in the Polytechnics (CHCP). The erstwhile Polytechnics have become known as the post-1992 universities.

Objectives and Membership

The objectives of CPHC are laid down in its constitution, namely: "to advance public education in the core subject of Computer Science and in the wider context of Computing and its applications."

To further these objectives, CPHC:

1. considers matters affecting research, scholarship, and learning in computing within universities, and their interaction with professional practice;
2. promotes quality and professionalism in computing;
3. formulates and expresses the views of senior academics in computing on such matters and makes recommendations to appropriate bodies; and
4. does all such other lawful things necessary for the furtherance of the objectives.

Those eligible for membership are professors and heads of computing departments in UK universities, and such other persons as the committee shall admit. Academics who are interested in and active in particular areas, but who are not professors or department heads, frequently contribute to CPHC activities.

There are 106 departments in the UK that are eligible to join CPHC, and 103 of them belong.

Structure and Funding

An Executive Committee, including the Chair, Vice-Chair, Secretary, and Treasurer, is elected at the annual conference. Officers normally serve for a maximum of two years and members can be re-elected for up to a total of seven years.

In 1995 it was decided to employ an Administration Assistant, whose role developed into that of Executive Officer and who also provides support for the Treasurer.

The CPHC is financed by subscriptions from computing departments, based on the number of academic staff. There are also small profits accruing from conferences and workshops. The organization is a Registered Charity because its objectives and activities match the requirements of the Charities Commission, which provides certain immunities from taxes.

Activities

The committee has set up a number of groups, and liaises with others. These groups are chaired in some cases by committee members, or the chair or another representative is co-opted onto the CPHC committee. The major areas where work has been done or is in hand are funding and lobbying, research, quality, learning and teaching, and the issue of the low numbers of women staff and students.

Funding: The CPHC was quite quickly recognized by the Higher Education Funding Councils (HEFCE) as the 'Subject Body for Computing.' CPHC members have met with HEFCE representatives to seek for computing a rate per student comparable to that for science or engineering, one that would take account of the practical work and project laboratories that are so essential to the subject. In this context, CPHC is expected to widen the discussion to include the views of the higher education colleges. These institutions run computing degree courses, but they are not universities, do not carry out research, and are not eligible to join CPHC.

Lobbying: There is an increasing amount of lobbying to get the Government to recognize the difficulties of retaining postgraduate students and recruiting academics, in the face of competition from commerce and industry for skilled staff. At the same time, it is clear that in another generation there will be a serious lack of people to carry out the research that contributes to the prosperity and expansion of the industry. Industry as well as academia is concerned. Members belong to the Parliamentary IT Committee, as well as organizations such as the e-skills National Training Organisation, the Alliance for IS Skills, and EURIM, where industry is also represented.

Research: The UK Computing Research Committee, comprising members of CPHC and with links to the CPHC Committee, is the main contact with EPSRC (Engineering

CPHC
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On Being a Part-Time IPA in NSF/CISE

By James J. Hickman

One of the largest hurdles a researcher faces in starting a new field is the creation of a source of funding in amounts large enough to allow a critical mass of researchers to push the field at a rapid pace. These groups tend to be a small community at first, one that requires input from new scientists in the primary area and, especially in emerging multidisciplinary fields, scientists from other fields who can be attracted by targeted investment.

One of the best ways to push new ideas at a funding agency is to bring in one of the leaders in this field to set up a new program(s). However, active researchers often cannot devote two years or so on a full-time basis because it would set their careers back a significant amount. It is also very difficult to maintain research programs on a part-time basis with a full-time IPA (Intergovernmental Personnel Action—an easy way to go from a nonprofit institution to work for the government for a limited time). I would like to suggest to researchers in emerging areas that an expert in a particular field can make a very large difference, even if contributing as little as one day a week, in an official capacity at the National Science Foundation.

For the past 18 months, I have been working in a part-time capacity at the National Science Foundation in the CISE directorate. I am writing this article from the perspective of an expert in the new field of biocomputation who spends one day a week at NSF to help set up a program in this area. By 'biological computation' I mean the process of studying how biological systems process and store information to serve as models or components for the next generation of algorithms, software, and hardware in computer and information science. I think this will be a critical area where advances in understanding will be the foundation on which next-generation artificial intelligence systems can be built.

When I started this IPA at NSF in June 2000, I was also setting up my labs in the Department of Bioengineering at Clemson University, a position I had accepted in May 2000. Juggling these two responsibilities for the past 18 months has been an interesting task. It raises an important point one needs to think about when considering a part-time IPA, especially if you are not local to Washington, but distance is certainly not an insurmountable obstacle.

For me, the primary driving force for helping to start this program at NSF, besides the basic intellectual challenge, was the scarcity of programs dedicated to biocomputation research at any government agency. There have been attempts to start biological computation programs over the past 10 years, such as the ill-fated Ultra-Scale Computing Program at DARPA and some small efforts such as the DOE's engineering focus within basic energy sciences. But there have been few large-scale, dedicated efforts. I felt it was necessary for someone to step up and try to get this area going, especially from a basic-research standpoint. Creating this program at NSF in CISE seemed like the perfect opportunity to address all of these issues, and I thought this was the right time and place to attempt this.

I was brought in to the Experimental and Investigative Activities Division of CISE by Rick Adrion and Ruzena Bajcsy because they saw biocomputation as an area CISE needed to develop from a computer science standpoint, not just a biological perspective. It was great working with visionaries like Ruzena who are not afraid to undertake non-traditional efforts and to continue to support them in the face of resistance.

To begin this program we first ran two workshops. One was a joint programmatic effort by Frederica Darema, Rick Adrion, and myself held at NSF in September 2000, which was highly successful. We brought in a small group of leading researchers and proponents of this area for a one-day workshop. These individuals represented a breadth of experience, from neuroscience to computer science as well as biomedical and electrical engineering and chemistry. This workshop laid the groundwork for the development of the program, and the report can be found on the EIA website.

A second workshop was held over a two-day period in January 2001 at Clemson, South Carolina to further explore the latest developments in biocomputation. More than 75 researchers with a wide variety of interests attended this event, including some international participants. Most importantly, approximately 15 attendees were from federal agencies such as NSF, NIH, DARPA, and DOE. This workshop report will be posted soon on the EIA website.

The program announcement entitled "Biological Information Technology," or BITS, was released in March 2001, and more than 40 applicants submitted proposals. Because not all of the awards have been finalized, I am unable to provide details of the types of submissions or numbers of awards. I can say, however, that a wide range of projects, from hardcore biology to hardcore computer science, have been supported, and everyone agrees the award process has been highly successful. BITS will be an ongoing program in EIA/CISE, with an annual due date of the first week in February. Details of the program can be found on the EIA website or on the general NSF program announcement website.

If you are considering a position as a part-time program manager or consultant in a government agency like NSF, you should be aware that you will probably be paired with, or be expected to work with, a full-time program manager in that division. Make sure *before* you accept the position that this is a person you can work with! If not, this could turn out to be a very difficult arrangement and much harder and less rewarding than you would hope for. You have to realize that you are low person on the totem pole, and it is really important to have a good working relationship with agency staff.

Another point that a part-time IPA needs to be aware of is that someone coming into NSF with this arrangement must be prepared, if successful, for others to be interested in your program, both from a positive and negative standpoint. In my experience, most people have been positive, supportive, and helpful. It is necessary to work for accommodation when negative or difficult situations arise; it may also be necessary to accept the fact that in certain cases this may be impossible. Like all highly visible situations, programs in new areas can attract very competitive individuals. Some will view your success as having a negative effect, either on their existing programs or on programs they may want to start. I saw some of this, but I believe that once the program got started and was proving successful we were able to navigate the occasional rough waters.

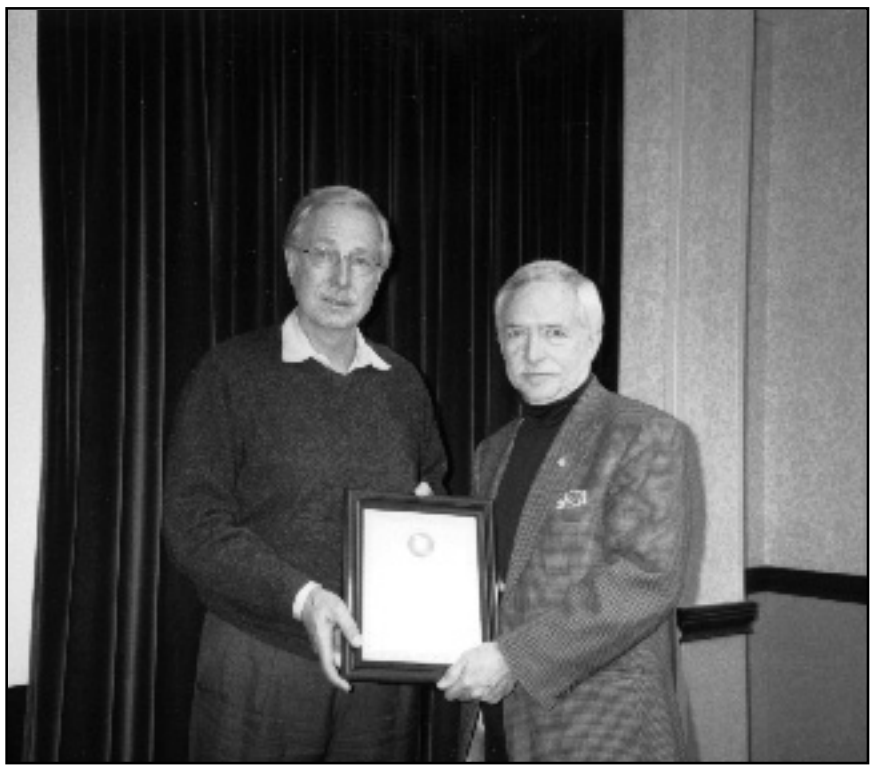
In my case, I believe the two workshops and the program announcement had sufficiently raised the awareness of biological computation in other areas of NSF, and in other federal agencies, to inspire similar efforts or complementary programs. This was an added benefit to my efforts to provide resources to research in this area.

Another difficulty you may encounter is that often NSF staff and full-time IPAs who come there are not at the cutting edge of a new field. Be prepared to be called self-serving if you have the occasion to talk about or present your own work. Presenting one's own work normally does not happen at NSF, but it may be necessary if you find that your perspective on a given topic is unique.

There are many positive aspects from my tour at NSF that anyone doing a similar service could also expect. I have met a number of wonderful people, both inside and outside the NSF. I also have a much better idea of how the system works and how one can make a large positive difference even in a limited capacity if the situation is right.

There are certainly some things that were more difficult than they had to be, but all in all I am happy a successful program was created in an area that desperately needed support.

James J. Hickman is the scientific advisor to the EIA director in CISE on biocomputation, as well as the Hunter Chair of Biomaterials in the Department of Bioengineering at Clemson University. He is also an adjunct associate professor of Chemistry at the George Washington University. ■



Peter Freeman (r), incoming head of NSF's CISE directorate, was honored by the CRA board at its February meeting for his many contributions during his 14 years as a board member. He is pictured above with Jim Foley, CRA's board chair.

Federal Funding Agencies

DOD/Air Force Office of Scientific Research

801 North Randolph Street
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http://www.afosr.af.mil

Mathematics & Space Sciences

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DOD/Army Research Office

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3701 N. Fairfax Drive
Arlington, VA 22203-1714
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National Institutes of Health

Bioinformatics

Office of Extramural Research
http://grants1.nih.gov/grants/bistic/bistic.cfm

National Institute of Biomedical Imaging & Bioengineering

http://www.nibib.nih.gov/

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National Library of Medicine

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President s Budget from Page 1

plan, NIH is slated to receive a 15.7 percent increase of $3.7 billion over FY 2002, bringing the total agency budget to $27.3 billion and completing a five-year effort to double the agency's budget begun in FY 1998. In contrast, NSF would receive $5.0 billion for FY 2003, an increase of 5 percent over FY 2002. However, contained in that 5 percent increase is the planned transfer of a number of science programs from the US Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and the Environmental Protection Agency (EPA) to NSF. Excluding those transfers (which are unlikely to happen, given the bipartisan opposition to the transfer in Congress), NSF would see an increase of only 1.4 percent for FY 2003.

This disparity in funding between the physical sciences and the life sciences has raised the ire of both communities, as well as many in Congress who see robust physical sciences as necessary for continuing discovery and innovation in the life sciences. Their vocal concerns have put the White House and the Office of Science and Technology Policy Director, John Marburger, on the defensive. Rather than argue that the NIH increase represents the last year of a long-term, planned doubling of the budget, Marburger asserts that the imbalance is justified because of the greater "complexity" involved in the life sciences. Speaking at an AAAS meeting Boston in February, Marburger addressed the concerns directly: "Those concerned refer to a balance that must be re-established between the life sciences and the physical sciences. I think on the contrary that the opening of the frontier of complexity creates far more opportunities in the life sciences, and that given the new atomic-level capabilities the life sciences may still be underfunded relative to the physical sciences."

This position does not sit well with many Members of Congress, including the members of the House Science Committee, who have traditionally been strong supporters of the physical sciences and NSF in particular. In late March, the Science Committee released its "Views and Estimates"—recommendations to the House Budget Committee regarding agencies and issues under the committee's jurisdiction—calling for a significant increase of 11.1 percent or $420 million to NSF's core research activities to alleviate some of the imbalance. This recommendation was favorably received by the House Budget Committee, which included the recommended increase in the House Budget Resolution. The resolution provides guidance to the House as it begins the annual appropriations process that will determine the final funding levels for all federal agencies. The House approved the resolution on March 20, 2002.

Given that the "will of the House" as evidenced by the vote for the Budget Resolution appears to be solidly behind an increase in funding for NSF, it is likely the House will act to increase funding for NSF during the appropriations process later this year—though how much depends on many factors including the state of the economy, the progress of the war effort, and heat of the election battle. The Senate is also viewed as widely supportive of NSF and the physical sciences, though at press time they had not yet begun to consider their own budget resolution.

It is not at all clear that Marburger is really committed to the complexity argument as the basis for research and development funding priorities. In a recent interview with National Journal's Technology Daily, Marburger appeared to backpedal.

"I don't want to argue about [complexity]," Marburger said. "I am making these statements to get the science community to think about the basis of their priorities, and I am listening hard to what they have to say. They [physical sciences community] must become engaged. They can't ask for more money without giving good reasons."

CRA Chairman James Foley and board members Ed Lazowska, Jeff Vitter, Randy Bryant, Mary Jane Irwin, and Phil Bernstein have already met Marburger's challenge, having participated in CRA's annual Congressional Visits Day on February 13, 2002. The CRA representatives took the case for federal support of IT R&D to Congress, meeting with their representatives in the Senate and the House, as well as with key staff members on the House and Senate Armed Services Committees and the House Science Committee.

For budget updates over the next few months, check with CRA's website at http://www.cra.org/govaffairs. ■

Service Awards from Page 1

chair of the upcoming October 2002 conference. She is a founding member of the Institute of African American E-Culture, an organization dedicated to instilling the notions of creativity and ownership of technology within the African-American community. She has built a very successful research record in high-performance computing and is the PI on an NSF NGS Grant to develop an infrastructure for automating the process of performance modeling of parallel and distributed applications.

Professor Taylor is a P.I. with the Education, Outreach, and Training Partnership for Advanced Computational Structure. She participated in the Argonne Lab's Science in Search of Women program (an annual event to attract high-school women to careers in science and technology), and many conferences and workshops on minorities and women. She has been a member of CRA's Committee on the Status of Women.

Taylor is a volunteer mentor in a housing project in Chicago, where she teaches science and mathematics to minority children. In February, she was awarded the 2002 Path Breaker Award from the Women in Leadership at Northwestern University. She received her Bachelors (1985) and Masters (1986) degrees in Electrical Engineering from Purdue University, and her Ph.D. (1991) in Electrical Engineering and Computer Sciences from the University of California at Berkeley. Additional information is available on the web at: http://www.ece.northwestern.edu/~taylor

CRA Distinguished Service Award

Andries van Dam is the Thomas J. Watson, Jr., University Professor of Technology and Education and Professor of Computer Science at Brown University. He has been on Brown's faculty since 1965, and was one of the department's founders and its first chairman from 1979 to 1985. He is a principal investigator, and was the director from 1996-98, in the NSF Science and Technology Center for Graphics and Visualization, a research consortium including Brown, Caltech, Cornell, North Carolina (Chapel Hill), and the University of Utah.

Professor van Dam, who served as CRA's board chair from 1985-87, was nominated because of his extensive influence over a number of years in many different areas. He has shown leadership in his sub-discipline and in the computing field as a whole. He has helped to establish several new disciplines, including graphics, hypertext, and distributed computing. He co-founded ACM SIGGRAPH, as well as the Institute for Research for Information and Scholarship and the Technology Center for Advanced Scientific Computing and Visualization, both at Brown University.

Professor van Dam has served on the technical advisory boards of several companies, including Microsoft Research, and on advisory committees such as ACM Curriculum '68; CRA; CSTB; NSF/CISE Advisory Committee; NAE Committee on Engineering Education; and CS departmental advisory committees (Georgia Tech and Princeton). He has promoted standards in the graphics community, and served as editor of multiple journals, such as *ACM Transactions on Graphics*; *Computer Graphics and Image Processing*; and *IEEE Transactions on Visualization and Computer Graphics*.

Andy van Dam has inspired large numbers of students to go into academic and industrial research careers. He has been involved with many startup companies as an advisor. His written contributions are prolific, and he has received numerous awards for technical work, including the ACM Karl V. Karlstrom Award; IEEE James H. Mulligan, Jr., Education Medal; ACM SIGSCE Award for Outstanding Contributions to Computer Science Education; SIGGRAPH Steven A. Coons Award; and the 2001 Harriet W. Sheridan Award for Distinguished Contribution to Teaching and Learning.

Professor van Dam is a Fellow of IEEE, ACM, and the American Academy of Arts and Sciences, and a member of NAE. He received the B.S. degree with Honors in Engineering Sciences from Swarthmore College in 1960, and the M.S. and Ph.D. from the University of Pennsylvania in 1963 and 1966, respectively. He holds honorary Ph.D.s from Swarthmore and Darmstadt Technical University. Additional information is available on his website at: http://www.cs.brown.edu/people/avd/ ■

Survey Results from Page 2

The majority of computer science doctorates who had definite employment plans in the United States either entered an academic position at a college or university or entered industry upon graduation. The other possible occupations accounted for less than 10% of those who had definite employment plans in the United States. Across the ten-year period, 53.92% of the women, compared with 35.00% of the men, entered academic positions. When this analysis is restricted to U.S. citizens or permanent residents, 55.85% of women and 37.89% of men entered academic positions. Men were more likely than were women to enter industry positions upon graduation. Across the ten-year period, men reported entering industry positions at a rate of 56.71%; women reported entering industry positions at a rate of 38.24%. When this analysis is restricted to U.S. citizens or permanent residents, men entered industry positions across the ten-year period at a rate of 51.04% and women at a rate of 34.95%.

Conclusions

This section briefly summarizes the major findings that were presented above. Each summary is followed by a question that is left for future research.

• The percentage of women who acquire doctorate degrees is gradually approaching parity with the percentage of men who acquire doctorate degrees. This is true regardless of whether the data included all doctorate degrees earned or are restricted to science and engineering doctorates. Yet, the percentages with respect to computer science doctorates are very different. At the current ten-year rate of growth, parity across men and women with respect to computer science doctorates will not occur for more than eighty years. Since the percentage of female U.S. citizens or permanent residents who are earning doctorates in computer science is decreasing, parity for men and women in this subgroup is not anticipated. *Why, despite the growth in female doctorates in science and engineering, are women not pursuing doctorates in computer science?*

• Women reported a higher mean and median amount of time enrolled between the completion of their bachelors' degrees and the completion of their doctorate degrees. Closer inspection of this data suggests that women require up to a year longer than men to complete their graduate education. This finding was consistent across the ten years of interest, and was true regardless of whether the data included all doctoral recipients or whether the data were restricted to U.S. citizens or permanent residents. *Does the additional time required of women in the pursuit of a computer science doctorate discourage female participation in computer science?*

• Although women appeared to have the advantage over men with respect to two sources of primary support—fellowships, scholarships and dissertation grants and teaching assistantships—this advantage for U.S. citizens or permanent residents amounted to a female and male difference of only 3.38%. Males, on the other hand, were more likely to report research assistantships, trainingships, or internships as a primary source of support than were females. This difference amounted to 10.82% for U.S. citizens or permanent residents. Women also reported a higher reliance on personal funds than did men (female, male difference of 6.16% for U.S. citizens or permanent residents). *Does the increased reliance of females on personal funds during the pursuit of the computer science doctorate discourage female participation in computer science?*

• The majority of women and men who completed their doctorate degree between 1999 and 2000 remained in the United States. The majority of these individuals sought to find employment, rather than to continue study. Men reported a higher percentage of acquiring positions in industry, whereas women reported a higher percentage of acquiring positions in academia. *What attracts women to careers in academia and men to careers in industry?*

A natural question that emerges from this data is whether the identified differences are the result of choices that women make during their education or whether they are the result of subtle discrimination that occurs throughout their education? It is unlikely that any given study can capture the type of information that is necessary to answer a question this broad. The answer will most likely emerge slowly, from ongoing systematic research that begins with the questions posed above.

Acknowledgments

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Barbara Moskal is an Assistant Professor in the Department of Mathematical and Computer Sciences at the Colorado School of Mines.

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Sanderson, A. R., Dugoni, B. L., Hoffer, T. B. & Selfa, L. (1999). *Doctorate Recipients from United States Universities: Summary Report 1998*. National Opinion research center at the University of Chicago, Chicago Illinois.

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Job Hunt from Page 5

Interpersonal issues are important. In addition to evaluating your research and your presentation, potential employers will be asking themselves, "Is this someone I'd like to have around … potentially forever?" Consequently, in one-on-one meetings and in social settings, project a person who is smart, engaged, open-minded, and of broad interest. Related point: beware of "entrapment"—don't say anything negative about person or place A to person or place B—it will kill you with both A and B.

Return home after the first visit—you'll need to re-group, and you'll need support to do it.

Schedule downtime while traveling. No one can give ten talks without a break and stay healthy and sane. Plus, you'll need time to tune your talk and your approach.

Phone home—let your advisor and your fellow students know how it is going. (Your advisor may be getting valuable back-channel feedback, too.)

The Advisor's Job

End-game elements include: helping to identify appropriate places to interview; letting colleagues know that your student is applying; helping to get the talk into shape; making the phone calls that the student would rather not make; acting as a sounding board; lending money if reimbursements lag and the student gets into a cash-flow squeeze.

Of course, the work really begins years earlier. In addition to providing great mentoring, the best faculty promote their students, greatly enhancing their prospects. A student who is known—who has a "justified buzz factor"—has a better shot than a hidden genius. Activities might include: bringing students to the leading conferences in their field and introducing them to your faculty colleagues, whether or not the students are presenting papers; allowing students to be the ones who present joint faculty/student work at conferences (and working to ensure *great* presentations); attending conferences where your students are presenting their own work, to provide support and ensure networking opportunities; supporting collaborative work outside the department (including placing students in strong internships).

At UW, we have a faculty meeting every fall where each graduating student is discussed in detail—strengths, weaknesses, accomplishments, goals—by the entire faculty. This allows faculty to brainstorm about options for each other's students, and positions each faculty member to be an effective advocate for each of the department's graduating students.

To end where I began: Our reputations—individually and institutionally—are built largely through the accomplishments of our students. It's our job as faculty to help each student—and to help students help themselves—to find the right position.

Acknowledgments

Thanks to Zach Ives, David Notkin, and Stefan Savage for critiquing this material. Time and space made it impossible to incorporate all of their excellent suggestions.

Ed Lazowska holds the Bill & Melinda Gates Chair in Computer Science in the Department of Computer Science & Engineering at the University of Washington. He is a CRA board member and served as board chair from 1997-2001. ■

Back to the Future for CREW and DMP

CRA's committee on the status of women in computing research (CRA-W) is planning a reunion for all students and mentors who have participated in its CREW and DMP research mentoring projects.

The Distributed Mentoring Project and the Collaborative Research Experiences for Women projects have been running since 1994, and almost 300 students have been funded through these programs. The reunion will take place on the evening of Friday, October 11, 2002, in Vancouver, B.C., in conjunction with the Grace Hopper Celebration of Women in Computing Conference. This reunion promises to be a very special event because it will recognize the contributions of mentors and celebrate the successes of the students, some of whom are now mentors themselves!

In order to send invitations to this event and to include participants in the CRA-W database, a website has been established to collect up-to-date contact information. See: http://nt.cra.org/Survey/craw/reg.asp. All information collected will be maintained in a database at CRA, and will be used only to contact past and current program participants about CRA-W-related events.

For information about CRA-W and its projects, see: http://cra.org/Activities/craw/projects/index.html

For information about the Grace Hopper Conference, see: http://www.grace-hopper.org ■

CRA Welcomes New Members

Labs/Centers

Fujitsu Laboratories of America, Inc.

Academic Departments

Illinois Institute of Technology (CS)
University of Arkansas at Little Rock
Utah State University (CS)

CRA-W Holds Successful Career Mentoring Workshop at SIGCSE

On February 27, CRA's committee on the status of women in computing held a daylong career/mentoring workshop entitled "Managing the Academic Career for Faculty Women at Undergraduate Computer Science and Engineering Instiutions" at the SIGCSE 2002 Conference.

The workshop, funded by NSF, was geared toward faculty members and advanced graduate students interested in undergraduate education. Workshop sessions offered mentoring activities specifically for women in undergraduate teaching and research who face particular challenges in pursuing and maintaining academic careers at primarily undergraduate academic institutions. CRA-W's main focus is on increasing the number of women participating in computer science and engineering research and education at all levels through research mentoring, community building, information sharing, and effecting organizational change. Based on participant evaluations, the SIGSCE met these goals.

Speakers included Nell Dale (University of Texas), Ann Smith (Saint Mary's University), Merry McDonald (Northwest Missouri State University), Dian Lopez (University of Minnesota-Morris), and Deborah Knox (The College of New Jersey).

In addition to sessions on teaching and mentoring students, the workshop discussed strategies for getting started with research/finding funding; staying current in a generalist environment; promotion and tenure issues; and time management. The workshop also provided networking opportunities that several of the 32 participants pointed to as especially valuable. "The opportunity to network with so many other women CS faculty was fantastic. I came back home from the workshop and SIGCSE with a renewed sense of excitement and energy," wrote attendee Laurie Murphy from Pacific Lutheran University.

Holding one of its career mentoring workshops in association with SIGCSE, a teaching-oriented conference, was a first for CRA-W. The enthusiastic response from participants and speakers convinced the committee to begin planning for SIGCSE 2003 with new and expanded topics. In particular, the need for a transition program/workshop for women seeking to move from the Masters level to the Ph.D. level was significant, according to workshop co-chair, Sheila Casteneda. "CRA-W hopes to cover this topic in more depth at the next mentoring workshop, and perhaps to expand into a multi-day event," said Casteneda. More information on CRA-W and its activities can be found at http://www.cra.org/Activities/craw/index.html. ■

CPHC from Page 6

and Physical Sciences Research Council). CPHC members conducted the recent Research Assessment Exercise on behalf of EPSRC and contributed to the International Review of Research in the UK. Future research grants are dependent on the results.

Quality: CPHC members contributed to the effort, under the aegis of the Quality Assurance Agency, to establish benchmarks against which the teaching of computing courses will be assessed. Members were recruited to carry out the assessment. A current issue is benchmarking Conversion Masters degrees so that they can be funded.

Learning and Teaching: This group provides guidance and runs workshops on a diverse range of subjects. It includes pedagogic issues, professional development, and use of IT in teaching, in conjunction with the Learning and Teaching Support Network (Government funded). The group has responded to Government proposal papers on learning issues.

Women's Issues: The Women Into Computing organization works with CPHC to identify and quantify the problems and to seek ways to alleviate them. A group has identified, and is steadily working on improving, the poor image that academic computing has among sections of government, industry, students, and their parents. There is a need to recruit more high-quality students, both men and women, to deal with the skills shortage.

There is close liaison with the professional bodies whose interests overlap with ours, primarily the British Computer Society, and, to a lesser extent, the Engineering Council and the Institution of Electrical Engineers. We exchange views with and offer support to our fellows in the Committee of Engineering Professors and the Deans of Science. There are links with CRA itself, and with ACM and IEEE.

All of these activities clearly fall under the first three of the organization's objectives outlined earlier.

Other activities come under the fourth. We maintain a directory of our members, which we are transferring onto our Web site and which will be updated electronically by the departments themselves. We maintain an email list; members can discuss matters of concern with their peers and obtain data and statistics. We have a list that can be used to match external examiners to vacancies, and another of forthcoming conferences. The minutes of the executive committee are circulated to members electronically, and we are trying out an electronic newsletter each term to inform members of the major issues and how they are addressed. Members are at liberty to distribute the news to staff in their departments and in the associated higher-education colleges. The annual conference and the Web site have already been mentioned.

In Conclusion

There are clear parallels between the activities of CRA and CPHC, and ways in which they differ. Both organizations face the problem of a shortage of students to fill the needs of industry and academia.

Many of the CRA activities described by its former Executive Director, Fred Weingarten, at the 1995 CPHC Conference have since become necessary for CPHC, notably with respect to lobbying efforts.

In the short term, CPHC has been successful in achieving recognition, first as the subject body and more recently as both the Government and the Opposition consult us. We see evidence of our input into parliamentary debates and questions.

In the longer term, we hope to see our efforts rewarded as computing is given the support it needs, the image of computing changes, and a higher proportion of women join us.

Aline Cumming is CPHC's Executive Officer (aline@cumming.dircon.co.uk). This is one of an occasional series of articles describing computing research in other countries. ■

Transitions/Awards

Anita Borg, founder and president of the Institute for Women and Technology, has been awarded the eighth annual $250,000 Heinz Award for Technology, the Economy, and Employment. It was awarded to Dr. Borg for encouraging women to pursue technical careers.

Nicholas (Nick) Cercone, former chair of the Computer Science Department at Waterloo University, has been appointed Dean of the Faculty of Computer Science at Dalhousie University, effective September 1, 2002.

The **EECS Center for Undergraduate Matters at UC Berkeley** has won the Women in Engineering Program Award for its Excellence and Diversity Programs. The Center's work "…demonstrates sustained local and national impact on pre-college, undergraduate and graduate women." Sponsored by the Women in Engineering Programs and Networks (WEPAN), the award will be presented on June 10 at the group's annual conference in Louisville.

Kent Fuchs, chair of ECE at Purdue University, will become the Dean of Engineering at Cornell University beginning in September 2002.

Frank Tompa has been appointed director of the new School of Computer Science at the University of Waterloo, effective May 1, 2002. Tompa was previously the chair of the Department of Computer Science within the Faculty of Mathematics at Waterloo. ■

Professional Opportunities

CRN Advertising Policy

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

California State University, Los Angeles

Department of Computer Science

Department Chair and Full Professor

Chair, Department of Computer Science as Full Professor (possible tenure upon appointment) at California State University, Los Angeles starting September 2002. [If unable to fill, may be converted to full-time probationary tenure track at Assistant/Associate Professor level.]. Ph.D. in Computer Science or related area required; demonstrated potential for teaching using variety of methodologies; proven record of research, scholarly and creative activity. In addition to being chief department administrator, Chair is responsible for teaching, working towards program accreditation, and building new M.S. program. Publications in peer reviewed journals and/or grant activity required, as is participation in university service and outreach. Must have demonstrated ability and/or interest in working in a multiethnic, multicultural environment. An Equal Opportunity/Title IX Disabled employer. All qualified applicants are encouraged to apply. Send letter of application and curriculum vitae. Arrange for three letters of recommendation and transcript from institution awarding highest degree**.** Employment contingent upon proof of eligibility to work in the United States. Review of applications begin January 7, 2002 and continue until position is filled. Address all correspondence to:

Search Committee
Department of Computer Science
College of Engineering
Computer Science and Technology
California State University
5151 State University Drive
Los Angeles, CA 90032

Case Western Reserve University

Electrical Engineering and Computer Science Department

Multiple Tenure Track Positions in Computer Science

The Department of Electrical Engineering and Computer Science invites applications at all levels for multiple tenure-track positions in all areas of Computer Science.

Areas of special interest are: networks and distributed systems; web computing; graphics and visualization; multimedia systems and computer-human interfaces; real-time systems; database systems; bioinformatics/computational biology; software engineering; programming languages; and artificial intelligence.

Appointments will typically begin in the 2002-2003 academic year.

Department Background: The Department currently has 29 faculty and offers degrees in electrical, computer and systems & control engineering and computer science. The Department has approximately 450 undergraduate students, 175 graduate students, and more than $3 million in annual research funding.

University Background: Case Western Reserve University is one of the nation's leading independent research universities, with programs that encompass the arts and sciences, engineering, the health sciences, law, management, and social work.

Case Western Reserve University is located in University Circle, a 550-acre, park-like concentration of approximately 50 cultural, medical, educational, religious, and social service institutions located at the eastern edge of the city center. University Circle attracts visitors from throughout the region to its concerts, theater performances, athletic events, art shows, public lectures, exhibits, and restaurants. Housing, shopping, and recreational facilities are all located in the area.

Contact Information: Each application must include a CV, a letter of transmittal as well as a statement of teaching and research interest, three references and brief biographical information for each reference. The department must have three letters of recommendation before an application can be considered. Please ask your references to send their letters directly to the department.

All applications and references — paper or electronic— should be sent to:

Prof. B. Ross Barmish, Chair
Department of Electrical Engineering and Computer Science
Case Western Reserve University
Olin 413, 10900 Euclid Ave.
Cleveland, OH 44106-7071
E-mail: chair@eecs.cwru.edu
VOICE: (216) 368-2802
FAX: (216)368-3905

In employment as in education, CWRU is committed to affirmative action and equal opportunity. Women and minorities are encouraged to apply.

E-mail for this position: chair@eecs.cwru.edu

Web page: http://www.eecs.cwru.edu/openings/

Dubai University College

The School of Information Technology at Dubai University College invites applications for faculty positions at all levels. The starting date is Fall 2002. Review of completed applications will begin immediately until all positions are filled. The School of IT offers Master of Science in Internet Computing, Bachelor of Science in Internet Computing and Bachelor of Science in Computing and Information Systems. The official language of the College is English and the courses are based on a credit hour and a semester system. The teaching load is four courses with no more than three preparations. Candidates in all areas of computer science will be considered but we are particularly interested in Database Systems and Data Warehousing, Networking, Multimedia Technology, Object Oriented Approaches, Software Engineering and E-Commerce. Candidates must have completed all requirements for their Ph.D. by the time of appointment. Candidates are also expected to have a research/publication record commensurate with experience, and a commitment to continue scholarly research and strong commitment to teaching.

DUC is a young college established in 1997, located in down town Dubai, and is supported by Dubai Chamber of Commerce. Dubai is a modern city, which offers a high quality of life and a triangulate mixture of eastern and western life style. The United Arab Emirates is a tax-free country. Beside the 12 month salary, DUC offers allowances for housing and schooling for children, health insurance, annual round trip air fair to the country of origin for the faculty member, spouse, and up to two children as well as two months paid annual leave.

Applicants are invited to submit, preferably via email, (1) letter of application stating the primary areas of teaching and research, (2) statement on teaching, (3) statement on research, (4) resume and (5) the names (including phone numbers, e-mail addresses, and stating the nature of the relationship between the applicant and the referee) of at least three references to:

jobs@duc.ac.ae or
Human Resource Department
IT Faculty Search Committee
Dubai University College
PO Box 14143
Dubai
UAE

Indiana University

Computer Science Department

Faculty Positions

The Indiana University Computer Science Department anticipates filling several tenure-track faculty positions beginning 2002-2003. Areas of interest are databases, embedded systems and networking. In addition our new, privately endowed, pervasive technology labs will be hiring several senior positions in the areas of graphics, human computer interaction, embedded systems and data mining. 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.

Knox College

Department of Computer Science

Computer Science Tenure-track Teaching Position

The Department of Computer Science invites applications for a tenure-track position at any level (including Instructor) to begin Sept. 1, 2002. We seek candidates with the potential for excellence in teaching and research in a liberal arts institution. While all areas of specialization will be considered, the following areas would be particularly complementary to the current faculty: database management systems, graphics and visualization, theory of computation. A Master's degree in Computer Science is required, a PhD is preferred.

The Department offers a Bachelors in Computer Science as well as minors with concentrations in Applied Computer Science, Theory of Computing, and Computing Systems. Departmental computing facilities include new student Linux laboratories, a student independent research laboratory, Sun Microsystems' Solaris machines, and access to the College's MS Windows and Apple Macintosh laboratories. The College operates a dedicated help desk and computer support center independent of the Department.

Knox is a highly selective independent liberal arts college with students from 47 states and 41 countries. The college is consistently ranked as one of the "Best Values" among national liberal arts colleges in the U.S. News & World Report survey of quality and price in higher education. Small classes, a strong advising system, and an emphasis on independent research foster close student/faculty interaction.

Please visit us at www.knox.edu for more information about the College, the department and our facilities.

To apply, please send a curriculum vitae, a letter detailing your interests and goals, and contact information for three references to:

John F. Dooley, Associate Professor
Department of Computer Science
Knox College, #138; 2 East South Street
Galesburg, IL 61401-4999
(e-mail: jdooley@knox.edu).

Review of applications will begin as soon as they are complete and will continue until the position is filled.

Knox College is an affirmative action, equal opportunity employer. In keeping with its 164-year commitment to equal rights, the College particularly welcomes applications from individuals in under-represented groups.

Ohio University

School of Electrical Engineering and Computer Science

Faculty Position

The School of Electrical Engineering and Computer Science (EECS) of the Fritz J. and Dolores H. Russ College of Engineering and Technology at Ohio University anticipates hiring at least one tenure-track assistant professor in Computer Science. Qualified applicants in all areas of Computer Science are encouraged to apply, but special consideration will be given to candidates in operating systems, distributed systems, computer networking, and databases.

All faculty are expected to participate in graduate and undergraduate teaching and in obtaining and participating in sponsored research. Applicants must have a PhD or equivalent in Computer Science. Salary considerations will be based on qualifications; the school provides nationally competitive compensation. Additional information on our programs, faculty, and facilities is available at http://webeecs.ent.ohiou.edu.

Applications will be accepted until the positions are filled; however, on-campus interviews of candidates will begin in May 2002. Send a vita including a statement of research and teaching objectives and the names of at least three references to:

Dr. Dennis Irwin, Chair
School of Electrical Engineering and Computer Science
Stocker Center, Ohio University
Athens, OH 45701-2979
irwin@homer.ece.ohiou.edu

Ohio University is an equal opportunity and affirmative action employer.

Queen's University

Department of Computing & Information Science

Tenure-Track Faculty Positions

The Department of Computing and Information Science invites applications for up to four faculty positions, including a Canada Research Chair position. Two of the positions require Professional Engineering registration or eligibility and commitment to register as a Professional Engineer.

Queen's University is one of the top universities in Canada and is well known for the high quality of its students and faculty. Queen's University is situated in Kingston, a beautiful and historic city located on Lake Ontario and within easy traveling distance of Toronto, Montreal, Ottawa and Syracuse. Kingston offers the amenities of a large city along with the comfort of a small city.

The Department of Computing and Information Science, which has 21 faculty, 12 staff and approximately 80 graduate students, is committed to excellence in both research and teaching. The department has strong research programs in areas such as software engineering and design, theoretical computer science, computer graphics, biomedical computing, intelligent systems, human-computer interaction and computer systems. The Department has one of the best teaching environments in Canada, and offers major and medial undergraduate programs in computing, as well as specialized programs in cognitive science, biomedical computing and software design. It offers graduate degrees at the masters and doctoral levels. Further information can be found at the Department's web site (http://www.cs.queensu.ca).

Applicants should hold a Ph.D. degree in computer science, software engineering, or a related field. The Department will consider applicants in all areas of computing; applicants are particularly sought in the areas of biomedical computing, software engineering and human-computer interaction. The successful candidate will be expected to have demonstrated excellence in research and the promise of excellence in teaching. Salary will be competitive and commensurate with qualifications and experience.

Applicants should send a full curriculum vitae, including a list of publications, teaching and research summaries, the names of three references, and copies of up to three recent papers to:

Dr. Janice Glasgow, Chair
Department of Computing and Information Science
Queen's University
Kingston, Ontario, Canada K7L 3N6

E-mail applications to search@cs.queensu.ca are encouraged. E-mail attachments in any common document format are acceptable.

Openings are for July 2002 and beyond. Screening of applicants will begin immediately and continue until all positions are filled. Queen's University is committed to employment equity and welcomes applications from all qualified men and women, including visible minorities, aboriginal people, persons with disabilities, gay men and lesbians.

All qualified candidates are encouraged to apply; however Canadians and permanent residents will be given priority.

Rochester Institute of Technology

The Computer Science Department invites applications for full-time tenure track positions. The department, part of the newly formed Golisano College of Computing and Information Sciences, offers an MS and CSAB-accredited BS degree in Computer Science. An important goal of the Institute and the College is to achieve diversity in the student body, faculty, staff, and administration. Applications from minorities, women, and other under-represented groups are especially encouraged. Applicants should be prepared to participate in a department that emphasizes a strong commitment to teaching as well as to consistent professional development. While a Ph. D. in Computer Science or a related field is preferred, applicants having a Masters degree in C. S., relevant industrial experience will be considered. Teaching experience is highly desirable. Please submit a letter of interest, a statement of teaching philosophy, a current resume and the names of three references to:

Search Committee c/o Sandy Ferrara
Dept. of Computer Science
RIT, 102 Memorial Drive
Rochester, NY 14623-5608
email: hiring@cra @cs.rit.edu
See a more complete description at
http://www.cs.rit.edu/~csdept/search

Seton Hill College

Two Computer Science Positions

The Division of Math, Science, and Computer Technology of Seton Hill College invites applications for two tenure track positions in Computer Science; Assistant Professor level; August, 2002. Applicants must have a strong interest in liberal arts education at the undergraduate level. Doctorate required.

Responsibilities include: teaching intro through advanced courses, curriculum review of B.A. Computer Science program and Information Science minor, academic advising, and committee service.

Seton Hill College is a Catholic liberal arts college located 35 miles east of Pittsburgh, PA and is an Equal Opportunity Employer.

Seton Hill College is committed to having our faculty and student body reflect the racial diversity of the global population, women and men of color are encouraged to apply. Send letter of application, curriculum vitae, transcripts, 3 letters of recommendation, statement of teaching philosophy to:

Susan Yochum, SC, Ph.D.,
Seton Hill College
Greensburg, PA 15601
FAX 724-830-1571
yochum@setonhill.edu

Syracuse University

New York State Center for Advanced Technology in Computer Applications and Software Engineering (CASE)
Department of Electrical Engineering and Computer Science
Center for Systems Assurance

Syracuse University has received $2.1 million of funding from the New York State Office of Science Technology and Academic Research (NYSTAR) to support basic and

(continued)

Professional Opportunities

applied research in information assurance (IA)– the assurance of the correctness, security, and availability of information and information systems. This program is known as SUPRIA—Syracuse University Prototypical Research in Information Assurance.

We seek academic researchers on a visiting basis at all levels including: faculty with distinguished records in IA who will be known as SUPRIA Fellows; other visiting faculty at all academic ranks; and post-doctoral researchers. These individuals will be considered visiting scholars of the Department of Electrical Engineering and Computer Science and members of the CASE Center, a NYSTAR Center for Information Assurance, and the Center for System Assurance, a National Security Agency Center of Academic Excellence in Information Assurance Education.

Aspects of IA of greatest interest include (but are not limited to) high confidence design; computer, communications, network, and information security; formal methods applied to specification, synthesis, verification of HW/SW/systems and security; cryptography; and computer and network forensics. Positions are currently available; applications will be accepted until the positions are filled. Generous compensation commensurate with qualifications; possibility of other incentives including coverage of housing costs and related expenses, on a case by case basis. These positions may be renewable after the initial one-year (or shorter) appointment. For full details, see the position description on the Web: http://www.ecs.syr.edu/dept/eecs/positions/supria.html.

To apply, submit a curriculum vitae, copies of selected publications, names, addresses (postal and e-mail), and telephone numbers of at least three references to:

Ms. Tami Britton
CASE Center
2-212 Center for Science and Technology
Syracuse University
Syracuse, NY 13244-4100
USA

Syracuse University is an Affirmative Action/Equal Opportunity Employer. Qualified applications from those groups that are traditionally underrepresented in faculties are urged to apply.

The University of Denver

The University of Denver invites applications for the position of Director of its newly created School of Engineering and Computer Science within the division of Natural Sciences, Mathematics & Engineering. The University's goal is to fill the position by September 1, 2002. The exact start date is negotiable. Candidates with a Ph.D. in computer science with a bachelor's degree in engineering are preferred; other degree combinations will be considered. Applicants lacking terminal degrees, but whose careers have attained the highest levels of distinction in business and industry, are also encouraged to apply. A distinguished record of accomplishments that merits appointment as a tenured full or associate professor is expected. Visit www.du.edu/NSME to obtain a full job description. Send applications to:

Mike Wirth
School of Engineering & Computer Science Search
University of Denver
2490 S. Gaylord
Denver, CO 80208
(mwirth@du.edu)

Review of applications will begin on April 15, 2002 and continue until an appointment is made. The University of Denver (www.du.edu) is committed to enhancing the diversity of its faculty and staff and encourages applications particularly from women, people of color, people with disabilities and veterans. The University of Denver is an EEO/AA Employer.

University of Houston

Department of Computer Science

Faculty Positions in Computer Science

The Department of Computer Science at the University of Houston (UH) seeks applicants for three tenure-track faculty positions at any rank. Successful candidates are expected to participate in teaching at all levels and to develop vigorous research programs. Areas of emphasis for this year's recruitment include bioinformatics, biomedical imaging, genome databases, and computational biology. Strong candidates in related fields will also be given serious consideration. The Department is experiencing a period of strong growth and expects this trend to continue. Last year the department hired four new faculty including two in the above areas. UH has embarked on an ambitious multidisciplinary bioinformatics and bioengineering program.

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 several centers and institutes on campus including the Texas Center for Computational and Information Sciences (TCCIS) and the Texas Learning and Computation Center (TLC2). The department and the centers have a substantial infrastructure to support both teaching and research activities (e.g., see www.cs.uh.edu, www.tccis.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 those with disabilities are encouraged to apply.

Screening of applications will begin immediately. Applications, including a resume, a list of publications and funding, and the names of at least three references (five for senior positions) should be sent to:

Faculty Search Committee
501 PGH, Department of Computer Science
University of Houston,
Mail Stop CSC-3010
Houston, TX 77204-3010 USA
713-743-3372 (voice)
713-743-3335 (fax)
search@cs.uh.edu (email)

University of Houston

Department of Computer Science

Department Head

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 expanding the department, including the recruitment of new faculty, increasing the funded research base, and interacting with the administration of the University and departmental faculty on long range planning. Areas of concentration include: bio-informatics, communications, computational science, computer vision, databases, data visualization, networks, programming languages and compilers, and systems.

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.

UH, together with Rice University, Baylor College of Medicine, and Texas A&M University, operates a regional OC-12 network connected to Internet2 of which UH is a charter member. Research activities include affiliations with The Texas Learning and Computation Center (TLCC), The Los Alamos Computer Science Institute, and the national grids projects. Significant opportunities for collaborative research exist within the University and with Rice University, the Texas Medical Center, the NASA/Johnson Space Center, and the region's strong industrial base.

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

Review of applications will continue until the position is filled.

University of Massachusetts Boston

Department of Computer Science

Non tenure track faculty position teaching three undergraduate CS courses/semester, advising students, and helping develop curriculum. Commitment to and experience in teaching CS required, Master's degree and industrial experience desired. See http://www.cs.umb.edu to find out about the Department. Send cover letter, curriculum vitae, a statement about your teaching experience and philosophy, and the names and email addresses of three references to lecturer-search@cs.umb.edu

Review of applications has begun and will continue until the position is filled. The University of Massachusetts is an equal opportunity, affirmative action employer and encourages applications from women and minorities.

UMass Lowell

Department of Computer Science

The Department of Computer Science at the University of Massachusetts Lowell seeks scholars with exceptional records or, for junior appointments, with exceptional potential to expand our suite of research groups. We invite applications for several tenure-track faculty positions to start in January 2002 or September 2002, from applicants with specialties in traditional or innovative areas of computer science. We anticipate hiring at the assistant professor level, but will consider candidates at all levels.

Our campus is located 35 miles northwest of Boston in the state's high-tech corridor and is considered the most technology-oriented of the five UMass campuses. The CS department had 18 full-time faculty, as well as over 400 undergraduates in our accredited bachelor's program and over 250 graduate students in the master's and doctoral programs. Our research specialties include human-computer interaction, visualization and perception, bioinformatics, database systems, networking and telecommunications, languages and compilers, object-oriented software engineering, internet and web systems and newly formed groups in computational complexity, computational geometry, network and system security, and robotics and assistive technology. For more information about us, please visit: www.cs.uml.edu.

We are seeking candidates who will contribute to the intellectual life of the department, the university and the region by establishing active research groups, teaching core and elective computer science courses to undergraduate and graduate students, and establishing professional connections with the some of the thousands of thriving information technology companies in the area.

Applicants must have a doctorate in Computer Science or a closely related discipline at the time of appointment. Please send a statement of research interests; curriculum vitae; selected relevant papers; the names, addresses, email addresses, and telephone numbers of at least three references; and, if appropriate, your residency status to:

Dr. Thomas M. Costello, Head
Department of Computer Science
University of Massachusetts Lowell
One University Avenue
Lowell, Massachusetts 01854
tom@cs.uml.edu

Review of applications will begin immediately and continue until the positions are filled. U. S. citizenship or permanent residency is required. The University of Massachusetts is an equal opportunity, affirmative action employer, and encourages applications from women and minorities.

Simon Fraser University

Canada Research Chairs, Tiers I and II

The School of Computing Science at Simon Fraser University is seeking candidates for one Tier I and one Tier II Canada Research Chair (CRC) positions. The Chairs provide competitive salaries and a reduced teaching load.

The School is on a growth path and currently has 130 Ph.D. and M.Sc. students, 600 undergraduate majors, and 35 research faculty. The CRC positions will play an important role in the ongoing expansion of the School, and in its growing interdisciplinary research profile.

Applicants for the CRC positions are expected to have an outstanding research program. Candidates should have a strong commitment to excellence in research and teaching and a strong record of publication, research funding, and student supervision and instruction. Outstanding candidates in all areas will be considered. Preference will be given to candidates in a systems area, such as software engineering, graphics, multimedia systems, database systems, distributed systems, networking, human computer interaction, or bioinformatics.

In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. Simon Fraser University is committed to the principle of equity in employment and offers equal employment opportunities to qualified applicants. Applications will be accepted until the positions are filled. For updated information, see www.cs.sfu.ca.

Additional information about the two types of chairs can be found at http://www.chairs.gc.ca.

Applicants should send a CV and names of references to:

CRC Search, School of Computing Science
Simon Fraser University
8888 University Drive
Burnaby, B.C. Canada V5A 1S6
Email = crc-search@cs.sfu.ca

Applications will be processed as they are received, but individuals interested in a CRC position should contact the School before June 30, 2002. Simon Fraser University (http://www.sfu.ca) is consistently one of the top-ranked, publicly funded universities in Canada. The university is situated on Burnaby Mountain in Greater Vancouver. Vancouver (http://www.tourism-vancouver.org/) thrives as a scenic waterfront city located just minutes away from the mountains and a wide range of outdoor activities. It boasts one of the mildest climates in Canada.

University of South Florida

Department of Computer Science and Engineering

Senior Faculty Position

Applications are invited for one senior faculty position (preferably at full professor level) in the Department of Computer Science and Engineering in the area of software testing to begin in August 2002. Applicants must already have achieved prominence in their field with a strong track record of funding. Salary for this position is up to $200K per academic year with up to 33% additional in summer salary possible. By SUS regulations, one day per week of private consulting is possible. The faculty member is expected to play a lead role in the federally funded National Institute for Systems Test and Productivity (http://www.csee.usf.edu/ softec.html).

The Department of Computer Science and Engineering offers BS degrees in Computer Science (CSAC accredited), Computer Engineering (ABET accredited), and Information Systems. The graduate program offers M. S. (90 students) and Ph.D. degrees (30 students). The department has 20 faculty members and over $5 million in research funding for 2000-2001. More information about the department can be found at http://www.csee.usf.edu/.

Applicants for this faculty position should send curriculum vitae, three letters of recommendation, representative publications, and a short statement of research and teaching goals to:

Dr. Ken Christensen
Search Committee Chair
Computer Science and Engineering
University of South Florida
Tampa, FL 33620-5399

Only highly qualified candidates should apply. Applications for graduate student and postdoctoral fellow positions are also invited.

The University of South Florida is an Affirmative Action / Equal Opportunity employer. Women and minorities are strongly encouraged to apply.

Professional Opportunities

University of Southern California
Intelligent Systems Division of ISI

Dedicated to research and education in computer science and information technology, the University of Southern California's Information Sciences Institute (ISI) is home to one of the world's largest research groups in **Artificial Intelligence**. It is particularly well known for its work in the areas of intelligent agents, knowledge representation, and natural language processing. The Intelligent Systems Division currently has an opening in the following area:

Knowledge Representation and Reasoning Systems USC/ISI's KR&R group has a long-standing track record in building cutting-edge KR&R technology such as its Loom and PowerLoom systems. Efforts such as the Semantic Web and advances in natural language processing are indicators that an explosion of structured content is just around the corner.

We are therefore in the process of scaling up our technology to be able to effectively represent and reason with very large amounts of realistic, imperfect knowledge. To help us in this endeavor, we are looking for a research scientist in the area of knowledge representation and reasoning systems. We are very interested in candidates who combine experience in traditional KR&R with some other relevant expertise such as Semantic Web and semantic markup languages, high-performance computing, deductive databases, reasoning with incomplete or conflicting information, ontology translation or ontology learning. Applicants should have excellent communication skills and a desire to work in an applied research environment. Experience in building complex software systems is a plus. We are primarily looking for PhD-level candidates, but qualified MS-level candidates will also be considered.

The Intelligent Systems Division of ISI is also interested in considering graduate and undergraduate students seeking summer internships in all areas of AI, as well as researchers who wish to visit with us.

ALL RESUMES MUST REFERENCE "AI."

Email your resume (plain text or PDF formatted files only) to: resumes@isi.edu

Mail your resume to:
USC/ISI
Resumes
4676 Admiralty Way, Suite 1001
Marina del Rey, CA 90292-6695
Fax your resume to: 310.305.8215

USC is an Affirmative Action / Equal Opportunity Employer

University of Texas
M. D. Anderson Cancer Center
Department of Biostatistics
Section of Bioinformatics
Assistant Professor

The University of Texas M. D. Anderson Cancer Center, the nation's premier cancer center, is seeking an assistant professor to join our active bioinformatics group in the Department of Biostatistics. The candidate will assist researchers in our proteomics facility. The candidate should have a Ph.D. in a computational science (bioinformatics, statistics, mathematics, computer science, or physics). Working knowledge of molecular biology, genomics, or experience analyzing microarray data or SAGE data would be a plus. Must be willing to combine an active research program in bioinformatics and biostatistics with collaborative ventures with biologists and clinicians.

Celebrating over six decades of Making Cancer History, UT M. D. Anderson Cancer Center is ranked one of the top two cancer centers in the nation and has been highly ranked in several specialty categories since 1990 in U.S. News & World Report's "Best Hospitals" survey. Located within the Texas Medical Center campus in Houston, our location provides access to a world-renowned medical community and the splendid cultural and recreational diversity of a sophisticated, metropolitan area that is the country's fourth largest city.

Please send curriculum vitae, a brief summary of research experience, and names and contact information for three references to:

Kevin Coombes, Ph.D.
The University of Texas
M. D. Anderson Cancer Center
Department of Biostatistics, Box 447
1515 Holcombe Boulevard
Houston, Texas 77030-4009

U.S. Army Medical Research and Materiel Command
Telemedicine and Advanced Technology Research Center
Postdoctoral Research Awards (Bioinformatics)

Postdoctoral positions are available in our Bioinformatics Group for applicants with Ph.D. in computer science, mathematics, statistics or related discipline interested in pursuing research in machine learning, data mining, data analysis and database systems. The Group's focus is on the development of computational tools to provide insight and analysis of genomics and proteomics data and to support biomedical research. The positions are offered through the National Academy of Sciences/National Research Council for research to be performed at the Army's Telemedicine and Advanced Technology Research Center, Frederick, MD. U.S. Citizenship may be required. To apply send resume (describing expertise and research interests) to:

Jaques Reifman, Ph.D.
MCMR-AT 540 Scott Street
Fort Detrick, MD 21702
reifman@tatrc.org
301-619-7915

WaveMarket
Department of Engineering
Senior Algorithms Scientist

WaveMarket, Inc. invites applicants for the position of Senior Algorithms Scientist.

Candidate will work both independently and with the R&D team to develop and prototype efficient algorithms and data structures for solving real-world problems in spatial and temporal-spatial processing. Candidate should have a Ph.D. in Computer Science or equivalent; published research in areas of discrete algorithms, data structures, or algorithmic engineering; and ability to translate algorithms into production-quality software.

Based in Berkeley, California, WaveMarket was the only software company in Q4'2001 to receive first-round funding of over $8 million — from the top-rated wireless investors Nokia Ventures and Saturn Ventures. Please send cover letter and resume to: seniorscientist@wavemarket.com.

Yale University
Department of Electrical Engineering

The Department of Electrical Engineering invites outstanding candidates to apply for a junior faculty position in the following two areas: (1) signals, systems, and information processing, with areas of specialization that may include (but not limited to) communications/networking, embedded and hybrid systems, biotechnology, and other related areas; (2) MEMS, with preference given to research areas that push the frontiers of optoelectronics and/or biomedical engineering. Faculty members are expected to contribute to Yale's Electrical Engineering program by teaching both undergraduate and graduate courses, advising graduate students, and developing strong sponsored research programs. Please send a resume and a list of five references to:

Chair
Department of Electrical Engineering
Yale University
P. O. Box 208284
New Haven, CT 06520-8284

Applications must be received by May 15, 2002, although earlier submission will be favorably reviewed. Yale University is an Equal Opportunity/Affirmative Action employer.

Grids from Page 6

(http://www.ipg.nasa.gov/), which connects several NASA centers. IPG makes available supercomputers, high-end scientific instruments, and terabyte datasets. A web portal, Launchpad, (http://www.ipg.nasa.gov/launchpad/servlet/launchpad), provides IPG users the ability to submit jobs to "batch" compute engines located at NASA centers across the United States, execute commands on these resources, transfer files between two systems, obtain status on systems and jobs, and modify the user's environment

The IPG team has pioneered grid development in the areas of automated parameter studies, grid services, system status, data mining, Globus security, performance monitoring, benchmarks, documentation, system availability, and testing. Issac Lopez heads the IPG team at NASA Glenn Research Center; at NASA Ames Research Center, the IPG team is led by Tony Lisotta, with supervision from Bill Johnston, Arsi Vaziri, and Tom Hinke, and support form team leads Mary Hultquist, Warren Smith, and George Myers; plus staff members and collaborators.

The IPG and PACI teams frequently cooperate to develop new capabilities for grids, and both teams help the Globus team with new solutions to grid problems. Grid development and deployment are based on cooperation across great distances and between diverse organizational groups.

Real Work Example

Here is just one example of how grids foster collaboration among these diverse groups. Recently, a NASA research scientist, Tiffany Moisan, NASA Goddard/Wallops Flight Facility, Wallops Island, Virginia, collected microbiological samples in the tidewaters around Wallops Island, off the coast of Virginia. To see the samples at the level her research required, she needed to use a high-performance microscope located at the National Center for Microscopy and Imaging Research (NCMIR), University of California, San Diego (UCSD). She sent the samples to San Diego, then used NPACI's Telescience Grid (http://www.npaci.edu/envision/v16.2/telescience.html) and NASA's IPG to view and control the output of the microscope from her desk on Wallops Island. In addition to viewing the samples through the high performance microscope; she could actually move the platform holding the samples—located across the continent—and manipulate adjustments to the microscope, from Wallops Island. The microscope produces huge sets of image data; in this case the image data was stored using a Storage Resource Broker (SRB) on NASA's IPG, and Moisan was able to run algorithms on the data while watching the results in real time.

Recent Developments

A new addition to the grid community, the Distributed Terascale Facility (DTF) Project, is being built by NSF's PACI. Research institutions NCSA, SDSC, Argonne, and Caltech will work in conjunction with IBM, Intel Corporation, and Qwest Communications, Myricom, Sun Microsystems, and Oracle Corporation. The DTF is expected to perform 11.6 trillion calculations per second and store more than 450 trillion bytes of data, with a comprehensive infrastructure called the "TeraGrid" to link computers, visualization systems, and data at four sites through a 40-billion-bits-per-second optical network.

The British Government, through the Office of Science and Technology and with the help of IBM, is building the National Grid for collaborative scientific research in a wide spectrum of disciplines.

Hot Topic

The buzz at the February 2002 Global Grid Forum (www.gridforum.org) was the Open Grid Services Architecture (OGSA) being proposed by Ian Foster, Carl Kesselman, Jeffry Nick, and Steve Tuecke. (Their paper, "The Physiology of the Grid: An Open Grid Services Architecture for Distributed Systems Integration" is available at http://www.globus.org/research/papers.html#OGSA). An interesting aspect of the paper is that Foster, Kesselman and Tuecke, longtime spokesmen for Globus and grids, are joined here by Jeffry Nick from IBM. More information is available at zdnet.com.com/2100-1105-839265.html.

Difficulties and Opportunities

As grids grow, grid communities will be looking for scientists and computer engineers to help build grids or to use grids for research. The NASA Advanced Supercomputing (NAS) Division at NASA Ames Research Center is a focal point for the joint university and government creation of NASA's IPG. To discuss possible opportunities for internships or collaborative research, contact Arsi Vaziri (avaziri@mail.arc.nasa.gov), IPG Deputy Project Manager.

Grid development is not for the faint of heart. As Rob Fixmer says, in *eWeek*, January 11, 2002, "Grid architecture, hailed in many circles as the next great evolutionary step in computer technology, is a simple concept that becomes very complex in its implementation." Imagine the difficulty of getting hundreds of brilliant developers, each with their own idea of how things should be, to cooperate enough to make geographically dispersed resources—and organizationally diverse policies—all work together. Almost all of these developers work anonymously; the level of cooperation obscures any clear picture of who did what. This article has attempted to name a few of the grid pioneers, but for each person mentioned, there are 20 people making significant anonymous contributions.

The security issues alone could have prevented grids from ever coming to fruition. But brave and cooperative people have prevailed, and many grids actually work. Still, grid computing is difficult. Trying to get something—anything—to work on a grid can cause a person to swear and throw things at the wall. Building grids is hard work, as challenging and daunting as building the Transcontinental Railroad across the United States in the 1800s. An extraordinary level of courage and cooperation is required. Nevertheless, while grid software may be difficult to use, it is still easier to do a geographically distributed task with the software than it would be to do it without.

In a recent discussion of the perils on the path to fully functioning computational grids, an IPG staff member was asked whether the difficulties could be overcome. She replied, "We're going for it!"

Pamela P. Walatka, a technical writer under contract to NASA, is a member of the IPG team, and the author of the Globus Quick Start Guide. ∎

CRA CONFERENCE AT SNOWBIRD 2002

The flagship conference for chairs of Ph.D.-granting departments of CS and CE and leaders from U.S. industrial and government computing research laboratories and centers interested in computing research issues.

Register Online at http://www.cra.org/Activities/snowbird/2002/

Sunday, July 14

CRA Board of Directors meeting (begins Saturday 6PM) 8:00AM - 2:45PM
Registration 2:00PM - 7:30PM
Workshop for New Department Chairs 3:00PM - 5:30PM
Chairs:
Randy Bryant (Carnegie Mellon University)
Kathleen McKeown (Columbia University)
Keynote Speaker: 5:30PM - 6:30PM
Robert Kahn, President
Corporation for National Research Initiatives (CNRI)
Welcome Reception 6:30PM -7:30PM
Dinner 7:30PM -9:00PM

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Monday, July 15

Breakfast Buffet 7:00AM - 8:30AM
Registration 7:30AM - 6:00PM
Welcome 8:30AM - 8:40AM
Speakers:
Phil Bernstein, Microsoft Research (Labs/Centers Snowbird Chair)
Leah Jamieson, Purdue University (Academic Snowbird Chair)

PLENARY SESSION I 8:40AM -10:10AM
Bioinformatics and Computational Biology
Chair: Oscar Garcia (Wright State University)
Speakers:
Eugene Myers (VP, Informatics Research, Celera Genomics): Computational Challenges in Genomics and Molecular Biology
Richard Karp (University of California and International Computer Science Institute, Berkeley): The Role of Computer Science in Genomics and Molecular Biology

Break 10:10AM -10:30AM

Workshop I (parallel sessions) 10:30AM - Noon

Bioinformatics, Genomics, Proteomics
Chair: Oscar Garcia (Wright State University)
Speakers:
Jim Cassatt (National Institutes of Health)
Aravind Joshi (University of Pennsylvania)
Peter Karp (SRI)
Gary Strong (National Science Foundation)
Trends in Research Funding
Chairs:
Dan Reed (University of Illinois at Urbana-Champaign)
Jeff Vitter (Duke University)
Speakers:
Michael Lesk (National Science Foundation)
Peter Lyster (Center for Scientific Review, NIH)
Shankar Sastry (University of California at Berkeley)
Undergraduate Curriculum and Accreditation Advances
Chair: Stu Zweben (Ohio State University)
Speakers:
Ben Huey (Arizona State University; Chair of the Computing Accreditation Commission of ABET)
Eric Roberts (Stanford University; Co-chair and Editor of the Computing Curricula 2001 Task Force)
Research in Corporate Labs
Chair: Dick Waters (Mitsubishi Electric Research Labs)
Speakers: tbd

Luncheon Noon -1:30PM
Keynote Speaker: Peter A. Freeman, NSF/CISE

PLENARY SESSION II 1:30PM - 3:00PM
Diversifying Computing: Three Perspectives
Chair: Bryant York (Portland State University)
Speakers:
Allan Fisher (Carnegie Mellon University)
Richard Tapia (Rice University)
Caroline Wardle (National Science Foundation)

Break 3:00PM - 3:30PM

Workshop II (parallel sessions) 3:30PM - 5:00PM

Computer Science and Other Disciplines: Mainframe, Client-Server, or Peer-to-Peer?
Chair: Margaret Wright (New York University)
Speakers:
Stuart Feldman (IBM)
Juris Hartmanis (Cornell University)
Edward Lazowska (University of Washington)
Margaret Wright (New York University)
When IT Becomes a Profession
Chair: Peter Denning (George Mason University)
Speakers:
Lillian (Boots) Cassel (Villanova University): B.S. IT Degree Programs
Susan Merritt (Pace University): Industry Expectations for IT Professionals
Maria Klawe (University of British Columbia): Research Directions and Opportunities
Peter Denning (George Mason University) The Core Skills of IT Professionals
Developing a Research Environment
Chairs:
Sheila Castaneda (Clarke College)
David Novick (University of Texas, El Paso)
Speakers:
Garrison Walters (Vice Chancellor for Academic Access Programs,The Ohio Board of Regents)
Joseph O'Rourke (Smith College)
Gary Strong (National Science Foundation)
Issues and Models for Academic-Industry Agreements
Chairs:
J. Strother Moore (University of Texas-Austin)
Gabby Silberman (IBM)
Dinner and State of the CRA Address 6:30PM - 9:30PM
Speakers:
James Foley (Georgia Institute of Technology)
William Aspray (CRA)

The CRA Distinguished Service and A. Nico Habermann Awards will be presented.

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Tuesday, July 16

Breakfast Buffet 7:00AM - 8:30AM

PLENARY SESSION III 8:30AM-10:00AM
Homeland Security
Chair: Eugene Spafford (Purdue University)

Break 10:00AM -10:30AM

Workshop III (parallel sessions) 10:30AM - Noon

Law, Policy, and Research
Chairs:
Andrew Hume (AT&T Labs)
Jon Peha (Carnegie Mellon University)
Speakers: tbd
New Academic Structures Involving Computing, Information Science, and Technology
Chair: Bobby Schnabel (University of Colorado at Boulder)
Speakers:
Robert Constable (Cornell University): Experience with a recently formed "school" of computing that includes core computer science.
Harry Bruce (University of Washington): Experience with a recently transformed information school.
Michael Dunn (Indiana University): Experience with a recently formed multidisciplinary IT school.
Bobby Schnabel (University of Colorado at Boulder): Recommendations of the CRA Academic Structures Task Force
New Pressures on CS&E Academic Units
Chair: Frank Tompa (University of Waterloo)
Speakers:
David Notkin (University of Washington)
Stephen Seidman (New Jersey Institute of Technology)
Debra J. Richardson (UC Irvine)
Industry/Academic Collaboration: What Works? What's New?
Chairs:
Tom Henderson (University of Utah)
Dave Waltz (NEC Research Institute)

Luncheon: Noon -1:30PM
[CRA Board Interaction with Conference Participants]

Workshop IV (parallel sessions) 1:30PM - 3:00PM
Technology Roadmaps and Plotting Research Routes
Chair: Mary Jane Irwin (The Pennsylvania State University)
Speakers:
Jan Rabaey (University of California at Berkeley): Silicon Technology Roadmapping/MARCO
Hector Garcia-Molina (Stanford University): Database Technology Roadmapping
Others tbd
The Business of Publication
Chair: Bob Allen (University of Maryland)
Chair, ACM Publications Board
Speakers: Lillian (Boots) Cassel (Villanova University)
Michiel Kolman (Elsevier)
Recruiting and Retention of Faculty
Chair: Jack Stankovic (University of Virginia)
Speakers:
Doris Carver (Louisiana State University)
Clayton Lewis (University of Colorado at Boulder)
Eric Roberts (Stanford University)
Industry Roundtable
Chairs:
Jim Foley (Georgia Institute of Technology)
Dave Waltz (NEC Research Institute)
Workshop for IT Deans 3:00PM - 9:30PM
Chair: Bobby Schnabel (University of Colorado at Boulder)

Program and Registration Information: http://www.cra.org/Activities/snowbird/2002/

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