Science Increases Abandoned in Final 08 Spending Bill
But Administration Seeks to Make Up Difference in 09 Budget Request

By Peter Harsha

Despite a year of positive milestones for the advocates of increased funding for three key science agencies, the final FY 2008 numbers for the National Science Foundation, National Institute of Standards and Technology, and Department of Energy’s Office of Science left many in the scientific community bitterly disappointed as lawmakers reneged on commitments to continue the effort to double basic research funding in favor of other programs and congressional earmarks.

In a year in which it seemed both the Administration and Congress stood strongly behind the goal of doubling funding for the physical sciences, computing, mathematics and engineering over the next seven years, a veto threat from the President over what he considered excessive spending proposals by congressional Democrats derailed an appropriations process that appeared promising. Instead, congressional Democrats, lacking the votes to override a presidential veto, had to scramble in a late December deal to cut $23 billion in planned discretionary spending to get beneath the President’s self-imposed spending “cap.” Lost in the $23 billion budget trimming were an approved 11 percent increase for NSF’s research accounts, a 15 percent increase for NIST’s research core, and more than half of a planned 18 percent increase for DOE Science.

The final deal, assembled and passed as the FY 2008 Consolidated Appropriations Act (P.L. 110-161), packaged the 11 unfinished appropriations bills, out of 12 total that Congress must pass every year to keep the federal government operating, into a massive omnibus measure. Included in that omnibus were the Commerce, Science, Justice appropriation, which includes funding for NSF and NIST, and the Energy and Water appropriation, which includes funding for DOE’s Office of Science—both of which had marched through their various committees of jurisdiction in Congress with significant increases for the science agencies approved. But when forced to trim, congressional appropriators sacrificed the planned big gains for science agencies to pay for other “higher priority” programs elsewhere in the bills.

The impact of the reduced omnibus funding levels on the science agency budgets in FY 2008 will likely be severe—though computing researchers fare marginally better than others in some cases. At the National Science Foundation, the lower-than-planned FY 2008 budget levels will fund 1,200 fewer research grants foundation-wide and the average award size will be smaller, according to the agency. Additionally, the number of NSF Graduate Fellowships will drop by 230, and the number of Faculty Early Career Awards will drop by five percent.

NSF does plan to move forward with the new $48 million Cyber-enabled Discovery and Innovation initiative (CDI) in FY 08, headed by its Computer and Information Science and Engineering (CISE) directorate; but the majority of other programs in CISE will see their growth slow (though not decline compared to FY 07). However, CISE will not be able to expand the number of grants it awards in FY 08 as it had planned. In fact, CISE personnel estimate that the directorate will award about 325 fewer grants than they anticipated they would for FY 08. On average, those grants would have supported over 400 graduate students, said NSF Assistant Director for CISE, Jeannette Wing.

The Department of Energy’s Office of Science was also impacted especially hard by the funding levels contained in the omnibus—though some computing programs in the agency were singled out for increases. Cuts to the budgets for programs in Fusion Energy, Basic Energy Sciences, High Energy Physics and Nuclear Physics will result in job losses for researchers—computing researchers among them—at nearly every major Energy laboratory.

National Center for Supercomputing Applications Powers Scientific Breakthroughs, Technological Innovations

By Trish L. Barker

This is another in a series of CRN articles describing the activities of CRA’s government and industry laboratory members. Others are posted at: http://www.crox.org/sports/lab/.

The National Center for Supercomputing Applications (NCSA) is a unique partnership of the University of Illinois, the state of Illinois, and the federal government. For more than two decades, the center has aided scientists and engineers across the country with powerful computers, innovative technologies and tools, and the knowledge and dedication of its expert staff. Investment in NCSA continues to yield concrete dividends for scientists, government, industry, education, and society.

NCSA has consistently been at the forefront of computing power, pushing the envelope with newer, faster technologies and moving these technologies into a robust production computing environment. Today, NCSA is home to a number of supercomputers that are designed and configured to support a broad range of science and engineering applications. All told, these computers can perform more than 140 trillion calculations every second (140 teraflops).

The Cutting-Edge of Computing Power

Researchers are demanding even more computing power for their work in astronomy, biology, chemistry, physics, engineering, and myriad other fields. The National Science Foundation has given NCSA the mission of fielding the first sustained-petascale system for open scientific research. This machine, called Blue Waters, will be developed in conjunction with IBM and the Great Lakes Consortium for Petascale Computation, which combines the expertise of institutions from across the country, including both universities and national laboratories. Blue Waters will become available to researchers in 2011, providing them with the power to tackle scientific problems that previously were out of reach.

In addition to raw computing power, the Blue Waters project includes substantial support for development of science and engineering applications, enhancement of IBM’s system software, interactions with business and industry, and undergraduate, graduate, and postgraduate education and training programs. This comprehensive approach will enhance opportunities for researchers across the country, and ensure that computing is a building block of scientific exploration into the future.
Expanding the Pipeline

Tapia Celebration of Diversity in Computing: 2007 Event Strongest Ever; Next Event Planned for April 2009

By Ann Redelfs

The Richard Tapia Celebration of Diversity in Computing Conference, a biennial event sponsored by the Association for Computing Machinery (ACM) and the IEEE Computer Society (IEEE-CS) in cooperation with the Computing Research Association (CRA), had its most successful event to date on October 14-17, 2007 in Orlando, Florida. The conference is the premier event for the Coalition to Diversify Computing (CDC), a joint organization of the ACM, CRA, and IEEE-CS. The next celebration will take place April 1-4, 2009, on the West Coast of the United States.

The Tapia conference series honors the contributions of Richard A. Tapia, University Professor of Engineering and Management Science at Rice University, and recognizes the accomplishments of minorities in computing. Tapia emphasized, “This event celebrates the achievements of minorities—from undergraduates through national leaders—in a setting focused on the achievements and opportunities of minorities in computing. I have watched the participants from the early years of this event go on to become national leaders in their own right, and I look forward to each event to meet the leaders of the future.”

Tapia 2007 Conference:
Top Attendance, New Sessions, and National Leaders
In Computing Add to Conference Momentum

The record number of 413 attendees in 2007 included 231 students and 62 faculty members from 101 universities. More than 30 companies and research institutions participated in the conference, offering multiple opportunities for the students, including summer research programs, internships, and job prospects. The Tapia 2007 Conference featured a range of presentations that were both useful and informative to every attendee, whether they were an established researcher, mid-career professional, or student still exploring their options in computing,” said Tapia 2007 Conference Chair Monica Martinez-Canales of Sandia National Laboratories. “By all measures, we had an outstanding event, truly celebrating the accomplishments of minorities in computing nationwide.”

The Florida event included the inaugural Ken Kennedy Distinguished Lecture, established to recognize the contributions of Kennedy, a Rice University professor who was one of the world’s foremost experts on high-performance computing and was a champion for diversity throughout his lifetime. The lecture was given by Manuela Veloso, a professor at Carnegie Mellon University, who spoke on “Multi-Robot Intelligence.”

Robotics was also featured through the Robotics Competition—a first time for the Tapia Celebration. Five teams of students from four universities in the United States and Canada designed, programmed, and sent their robots on competitive search and rescue missions. The Robotics Competition award went to the Fuder Fischer team from Harvey Mudd College, including team members Rachel Arecja-Jager, Vedika Khemani, and Jessica Wu, with faculty advisor Zach Dodgh. The Robotics Technical Achievement award was given to the Nexus 6 team from Simon Fraser University. Advised by faculty member Richard Vaughn, the team members were Lorin Beer, Angelina Balasa, Angelina Lim, and Kathleen Tsookalas.

The Doctoral Consortium provided an opportunity for Ph.D. students to discuss and explore their research interests and career objectives with a panel of established researchers. “The Doctoral Consortium was a great success,” said Gozhi Shi, Nina Benet of Sandia National Laboratories, who was also named as the Tapia 2009 Conference Chair. “The students’ technical interests ranged from optical sensor networks to numerical optimization and privacy issues, and the panels were impressed by the students’ expertise and communication skills.”

A Commitment to Student Experiences, Networking, and Success

The Tapia Celebrations have a history of focusing on students, including their active participation in all aspects of the conference. The strongest support for their involvement comes from student scholarships to attend the conference, which are funded by conference sponsors. At the beginning of the conference, a Student Orientation session provides them with advice on getting the most out of the conference. Students have a wide range of experiences—two examples follow:

- Javier Rosa, a Rutgers University undergraduate with a double major in computer science and mathematics, attended the Tapia Celebration for his first professional conference. There he saw student presentations that helped him visualize his own participation in conferences. “I really enjoyed the exposure to other people who were promoting their ideas and experiences,” said Rosa, “as well as the opportunity to meet with so many role models and fellow students.” Immediately after attending the conference, Rosa’s research interests expanded to include bioinformatics after he was diagnosed with testicular cancer. “Participating in the broader research community at events like the Tapia Celebration is important to my career and my research,” said Rosa. “I expect to submit a paper to the 2009 event.”

- Just after starting her Ph.D. program at Auburn University in the fall of 2007, Andrea Jager’s major advisor, Jessica Wu, suggested she apply for a scholarship to attend the Tapia Celebration. Her application was accepted, and she found the conference of value to her career: “I remember calling my mother, who is a professor, about one of the parallel computing talks. Meanwhile, the Chair of Computer Science at Texas A&M University—who really hit on the options people have in their careers, and the university environment, including some honest remarks about the need for training for teaching at the college level. I appreciated her honesty, and felt connected to what she had to say.”

Tapia Celebration Awards

In addition to the awards for the newly established Robotics Competition and the Ken Kennedy Distinguished Lecture, the conference includes the Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science, and Diversifying Computing and the conference best poster awards. The Tapia Achievement Award, which recognizes outstanding achievements in scientific scholarship, a strong civic presence within the scientific community, and a dedication to the attainment of true ethnic diversity in computing and related disciplines, was given to Peter A. Freeman of Georgia Tech, formerly with the National Science Foundation (NSF). A special Tapia Achievement Award was given posthumously to Ken Kennedy, presented by Keith Cooper of Rice University to Kennedy’s wife, Carol Quillen, Vice Provost for Academic Affairs at Rice.

A committee of nationally recognized researchers, led by Fosters Chair Barbara Foss-Guy at University, reviewed the posters for technical content and presentation. Graduate student poster awards went to Kim Designor (1st place), Tao Cui, Caltech (2nd place); and Talitha Williams, Rice University (3rd place). Graduate student poster awards went to Michael Eagle, University of North Carolina–Charlotte (1st place), Perry Parker, University of New York (2nd place), and Ronnie I. Parker, IV, Georgia Tech.

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Message from the CISE AD
Data-Intensive Computing

By Jeannette M. Wing, Assistant Director of NSF for CISE

I have some exciting news to share with all of you: NSF is partnering with Google and IBM to explore data-intensive computing. Through NSF’s reach, Google and IBM are providing software and services running on a large cluster to the broad academic community to explore innovative research and education ideas in data-intensive computing. Google and IBM launched the Academic Cluster Computing Initiative [1] last October with instructional programs at six pilot universities and the NSF will be joining this initiative as the first research-oriented pilot partner. We are calling the NSF program to provide access to these types of resources the Cluster Exploratory (CluE).

Here are excerpts from a prior announcement made by Dan Atkins (Director, Office of Cyberinfrastructure) and me to the community.

Data-Intensive Computing

Data-intensive computing is a computational paradigm in which the sheer volume of data is the dominant performance parameter. Storage and computation are colocated, enabling large-scale parallelism over terabytes of data. For example, Google runs an average of 100,000 MapReduce jobs per day on its clusters, processing over 20 petabytes daily [2]. This scale of computing effectively supports applications specified in high-level programming primitives, where the runtime system manages parallelism and data access. The architecture is extremely fault-tolerant and exhibits high degrees of reliability and availability.

Data-intensive computing raises important research challenges:
- For science
- What are the fundamental capabilities and limitations of this paradigm?
- What new programming abstractions (including models, languages, algorithmic) does this computational model suggest?
- For technology
- How can we automatically manage the hardware and software of these systems?
- How can we reduce their energy consumption?
- For society
- What (new) applications can best exploit this computing paradigm?

Data-intensive computing is at the forefront of ultra-large-scale commercial data processing. A July 2006 New York Times article [3] notes that “Google, Microsoft and Yahoo are spending vast sums of capital to build out their computing capabilities.” Not only is there an increasing need for advances in data-intensive computing systems software and hardware, but also an increasing demand for a trained workforce to operate and use these systems. To date, however, the academic community has had limited access to such systems.

Enter Google and IBM

On October 8, 2007, Google and IBM announced they had teamed to provide six universities access to a large-scale computing cluster together with the software and services to use it effectively [4]. After several months of discussions, the NSF will be joining this initiative and will be partnering with Google and IBM to broaden the reach of this powerful computing resource to foster more innovation than might be possible in the initial pilot.

Access to the Google-IBM academic cluster via the CluE program will provide the academic community with the opportunity to do fundamental, disruptive research in data-intensive computing and to explore powerful new applications. This facility can also serve as a tool for educating the next generation of scientists and engineers. This partnership is an excellent example of an academic-industry-government relationship that is a win-win-win situation for all.

System Description

The Google-IBM cluster contains well over a thousand processors connected to terabytes of memory and hundreds of terabytes of storage with internal networking as well as a substantial external network connection. The system will be configured with open source software to include Linux and Apache Hadoop [5]—a large-scale distributed computing platform inspired by Google’s MapReduce [6] and the Google File System [7]. IBM’s Tivoli [8] software will also be used for management, monitoring and dynamic resource provisioning of the cluster.

The system will provide a powerful resource for large-scale data analysis, mining and visualization in addition to support for Internet-scale computing applications. Tutorial information describing the programming environment of the Google-IBM academic cluster available via the CluE program can be found on the Google Code for Educators website [9]. Much of this material was developed in collaboration with the University of Washington, and all of it is available under permissive licenses such as the Creative Commons Attribution License.

Upcoming Solicitation

CISE is currently developing a program solicitation that will invite researchers to submit proposals requesting access to the Google-IBM cluster for any new, innovative use of the system and to probe the possibilities and fundamental limits of this new computing platform. The announcement of the program will be to develop new approaches and applications that are outside the typical use cases for computing applications running on today’s supercomputers.

The challenge to the academic community is three-fold: to use existing tools and to develop new programming abstractions for such a “computing-to-solve problems unanswerable any other way” to solve old problems in simpler or more efficient ways; and to enable new applications. This resource will also provide an opportunity to teach students how to build, use and manage data-intensive computing systems—systems that are already being used widely in industry, but are largely

Musings from the Chair
Research Funding and Education: Stay the Course, Keep the Faith

By Dan Reed, CRA Board Chair

As all of you undoubtedly know by now, at the eleventh hour, the new funding for physical science (research including computer science) disappeared from the omnibus appropriations bill. This was especially disheartening after all the work invested by so many and after the America COMPETES Act authorized major increases earlier in the year, with strong bipartisan support. Thus, we rightfully had high hopes for a corresponding appropriation. It was not to be.

As a consequence, the National Science Foundation (NSF) and the Department of Energy’s Office of Science have had to reevaluate plans and in some cases expect to fund 1,000 fewer research grants in FY08 than planned, and the average award size will be smaller. In addition, NSF Graduate Fellowships will drop by 230 and the number of Early Career awards will likely drop by five percent. (For a summary of the implications, see www.cra.org/goaffairs/blog.)

Funding: Stay the Course

There is little prospect that this can be changed during the current fiscal year. However, the science community is already mobilized for the next budget. During President Bush’s recent State of the Union address, one of the few things that drew a bipartisan standing ovation was the following comment:

Last year, Congress passed legislation supporting the American Competitiveness Initiative, but never followed through on the funding. This funding is essential to keeping our scientific edge. So I ask Congress to do its part for the support for critical basic research in the physical sciences ... There is hope, and I urge you to get involved if you are not and remain involved if you are. It is imortant that your voice be heard if we are to reestablish our current research funding shortfall by making the case that science and computing are critical enablers of economic growth, national innovation and education.

Education: Keep the Faith

As we debate the possible effects of an economic downturn, it is even more important that we articulate—clearly and forcefully—the importance of computing innovation and education as economic engines. As Thomas Friedman reminded us in his book, “The World is Flat,” we live in an interconnected knowledge-driven economy. Innovation depends on a workforce of trained and engaged talent. That has never been truer in computing, as we consider computing’s role among our students and the nature of 21st century computing curricula.

In this spirit, and as I have mentioned in previous columns, CRA has created a new computing education committee (CRA-Ed) whose charge is to think broadly about the future of computing education. We cannot continue the indefinite addition of layers to the computing curriculum onion that was defined in the 1970s. We believe we need to rethink some of our fundamental assumptions about computing education approaches and content.

Hence, I am delighted to report that Professor Andries (Andy) van Dam from the University of Michigan agreed to serve as the initial chair of the CRA-Ed committee. Not only is Andy a distinguished and respected researcher, he is passionate about computing education, its theory and practice. As Andy engages the computing community, he will urge you to engage and participate. This is vital.

Dan Reed
CRA’s Board Chair
Microsoft’s Suable and Malware Computing Strategist. Contact him at Daned.Reed@microsoft.com or his blog at www.hpcdan.org
Enrollments and Degree Production at US CS Departments Drop Further in 2006-07

By Jay Vegso

CRA’s Taulbee Survey of Ph.D.-granting Computer Science (CS) and Computer Engineering departments in North America has been conducted annually since 1974. Results from the most recent survey were provided to participants and CRA members in February. They will be published on CRA’s website (www.cra.org/statistics/) and in Computing Research News in May. Due to widespread interest, CRA releases data on undergraduate degrees early.

This report discusses CS bachelor’s degree enrollments and production among the Ph.D.-granting departments in the United States since the late 1990s. Data are reported in both total numbers and medians per department, and the latter limits the effect of variants in response rates. Results from the Taulbee Survey should be compared with data produced by the National Science Foundation (NSF), which surveys all institutions that grant CS degrees (whereas Taulbee is a survey of the doctorate-granting departments only). NSF’s most recent data are from academic year 2004/2005.[1]

According to HERU/UCLA, the percentage of incoming undergraduates among all degree-granting institutions who indicated they would major in CS declined by 70 percent between fall 2000 and 2003.[2] Unsurprisingly, the number of students who declared their major in CS among the Ph.D.-granting departments surveyed by CRA also fell. After seven years of declines, the number of new CS majors in fall 2007 was half of what it was in fall 2000 (15,958 versus 7,915). Nevertheless, the number of new majors was flat in 2006 and slightly increased in 2007. This might indicate that interest is stabilizing.

The decrease in new majors has meant that the number of students enrolled in CS has fallen for several years. Between 2005/06 and 2006/07, enrollments went down by 18 percent to 28,675. Overall, enrollments dropped 49 percent from their height in 2001-02, while the median number of students enrolled in each department fell 53 percent since 2000/2001. These declines have had a significant impact on degree production.

Following several years of increases, the total number of bachelor’s degrees granted by Ph.D.-granting CS departments fell 41 percent to 8,021 between 2003/04 and 2006/07. The median number of degrees granted per department declined 39 percent to 42. The sustained drop in total enrollments and student interest in CS as a major suggests that degree production numbers will continue to drop in the next few years.

It is important to note that a steep drop in degree production among CS departments has happened already. According to NSF, between 1980 and 1986, undergraduate CS production nearly quadrupled to more than 42,000 degrees. This period was followed by a swift decline and leveling off during the 1990s, with several years in which the number of degrees granted hovered around 25,000. During the late 1990s, CS degree production again surged to more than 57,000 in 2004.[3] In light of the economic downturn and slow job growth during the early 2000s, the current decline in CS degree production was foreseeable.

To view this article with accompanying graphs, see: www.cra.org/bulletin.

Notes:

[1] See Appendix Table 2-1 at www.nsf.gov/statistics/srs6/02v42.htm


Jay Vegso can be contacted at vegso@cra.org.

Science Increases Abandoned from Page 1

including Oak Ridge National Lab, Sandia, Los Alamos, FermiLab, and the Stanford Linear Accelerator.

At the same time, appropriators included a sizable increase in the funding for the department’s Advanced Scientific Computing Research program. Included in the 25 percent increase over FY 07 is $19.5 million to continue the department’s participation in the DARPA High Productivity Computing Systems partnership, an increase of $7.1 million for the Oak Ridge Leadership Computing Facility, and the creation of a new “Institute for Advanced Architectures and Algorithmics” with Centers of Excellence at Sandia National Labs and ORNL.

The bill also reprograms much of NIST’s planned increases to its core research efforts to construction—which includes a new “research facilities construction” program—and retrofits the National Institutes of Health,[1] The new Defense department bill will essentially renege on nearly all of the proposed spending for science urged by the President’s American Competitiveness Initiative, the Democratic Innovation Agenda, and the funding recommendations endorsed by Congress as a whole when it passed the America COMPETES Act (see CRN, November 2007, Vol. 19, No. 5). The President nevertheless signed the bill into law in late December. In early February, he introduced a FY 2009 Budget Request that would make up the ground lost by NSF, NIST and DOE Science in the omnibus and put those agencies back on track to double budgets by 2014. In addition to putting those agencies back on a doubling track, the President’s budget request would provide the largest increase for computing research across the federal government in several years. For FY 09, the President is requesting a 6 percent increase in funding for the Networking and Information Technology Research and Development program (NITRD)—the $3 billion-plus, thirteen-agency program that constitutes the total federal investment in information technology research and development. Slated to grow the most in terms of IT R&D spending are NSF—which would see its NITRD share grow 17 percent to $1.1 billion in FY 09, the first time NSF’s share has crossed the billion-dollar mark—and DOE’s Office of Science, which would grow 13 percent to $494 million in FY 09.

At press time, it appeared that the Department of Defense’s share of NITRD would actually decrease 2 percent compared to FY 08, to $1.2 billion in FY 09. However, because the Defense Budget department is heavily earmarked by Congress, and because the Administration strips out those earmarks in subsequent budget requests, it was not clear whether the FY 09 request represents an actual decrease compared to a non-earmarked FY 08 budget. For the latest analysis of how computing research fared in the Defense Department budget request, be sure to check the Computing Research Policy Blog at http://crn.org/blog.

Computing research is featured prominently in the National Science Foundation request for FY 09. The Foundation’s Cyber-enabled Discovery and Innovation program would expand considerably under the agency’s plan, growing from $48 million in FY 08 to $100 million in FY 09, including $33 million in CISE. Additionally, the Foundation has proposed two new foundation-wide initiatives that have strong computing foci. The first is a $20 million investment in “Science and Engineering Beyond Moore’s Law,” which “aims to position the U.S. at the forefront of communications and computation capabilities,” and would be led by the physical and computational limitations of current systems.[5] That program would be led by the Mathematics and Physical Sciences directorate, but CISE would control $6 million in awards. The second is a $15 million investment ($3.5 million in CISE) in “Adaptive Systems Technology,” which focuses on “generating pathways and interfaces between human and physical systems that will revolutionize the development of novel adaptive systems.”

Additionally, CISE would see its budget increase by 19.5 percent, or $104 million, in FY 09 under the President’s plan—essentially making up all the ground lost with the omnibus. Programs of note within the directorate include:

• $78 million for Computing Fundamentals—set aside for basic, potentially transformative research answering fundamental questions in computing that have the potential for “significant, enduring impact.”

Foci include cyber-physical systems, data-intensive computing, software for complex systems, cybersecurity, network science and engineering, and understanding “what is computable?” when humans and machines work together to solve problems neither can solve alone.

• $33.6 million for CDE: CISE would contribute over a third of the total $104 million investment in the initiative and would be the “lead” directorate.

The request for DOE’s Office of Science includes a 5 percent increase for the Advanced Scientific Computing Research program compared to FY 08, increasing that program to $369 million in FY 09. Included in $93.2 million for applied mathematics and computer science research, $58.1 million for the Scientific Discovery through Advanced Computing (SciDAC) program, and $217.5 million for high performance computing and networking facilities and methods.

Once again, for the complete breakdown and the latest analysis of all the noteworthily computing research accounts, visit the Computing Research Policy Blog at http://crn.org/blog.

Notes:

Big Data Computing Study Group
March 25-26, 2008, Sunnyvale, CA

Under the sponsorship of the CCC, the Big Data Study Group will explore and enable opportunities for research and applications of high-performance, data-intensive computing systems, benefiting application areas ranging from astronomy to machine translation. To begin this effort, we will hold two events in March 2008.

Hadoop Summit [March 25]

‘Hadoop’ is an open source project developing software that enables data-intensive computing on cluster-based systems. It includes a distributed file system and programming support for Map/Reduce, a data-parallel notation for expressing both element-wise and aggregating operations on collections of data. Hadoop is being used by companies in production environments, by both academic and industrial research groups, and at universities for teaching data parallel computing.

This summit will bring together the leaders, developers, and users of Hadoop for the first time. The speakers will present case studies on how Hadoop has been applied in a variety of contexts, assessments of its strengths and weaknesses, and discussions on future directions for the project.

Data-Intensive Computing Symposium [March 26]

This symposium will cover a broad range of topics, with presentations by industry and academic leaders on all aspects of data-intensive computing, including systems, programming, algorithms, data management, and both scientific and information-based applications. Confirmed speakers include: Jeff Dean, Google; Phil Gibbons, Intel; Garth Gibson, Carnegie Mellon; Joe Hellerstein, U.C. Berkeley; Ian Klehmberg, Cornell; Ed Lazowska, U. Washington; Marc Najork, Microsoft Research; Raghv RanjanValary, Yahoo! Research; Dan Reed, Microsoft Research; Alex Sizun, Johns Hopkins; and ChengXiang Zux, U. Illinois.

From Internet to Robotics: The Next Transformative Technology

Over the last two decades the Internet has in many ways transformed our daily lives from work routines to social networking. The Internet is an impressive medium for interconnecting computers. However, almost all of these computers are passive devices with no, or only very limited, facilities for interactions with the physical world. Robots, on the other hand, are devices designed to interact intelligently with the environment. Over the next decade or two, it is predicted that robotics will have an impact on our daily lives at least equal to that of the Internet.

Already robotics allows us to perform better surgery, automatically park cars, clean our homes, and explore remote planets. Society is currently experiencing significant aging which will impact industry, healthcare, and our daily lives. Robotics facilitates a higher degree of autonomy for people, new methods for manufacturing closer to the customer, and an entirely new industry in terms of services, not to mention new technologies for security and defense. Robotics has the potential to radically change most aspects of our lives, ranging from work to domestic chores to entertainment.

The current CCC is now working to create a roadmap of applications for robotics across users, producers and researchers. The objective is to provide a comprehensive view of the use of robotics, identify the main obstacles to deployment, and identify the key competencies necessary to facilitate the transformation. Some of these key competencies are not available today due to fundamental problems in design of systems. The process will identify such basic problems that will have to be addressed in order to ensure continued progress. Both market drivers and technology push will be considered as mechanisms for design of new systems.

The CCC study will run over the period 2008-09. It will involve several domains to ensure coverage across a diverse set of possible applications, and it will include broad community involvement. A fundamental objective of the study is to ensure that basic research addresses the key problems that will allow American companies to have a leading role in the deployment of future generations of robots.

Leadership of this study includes: Henrik J. Christiansen, PI (Georgia Tech); Office Bruce (University of Massachusetts); Ken Goldberg (U.C. Berkeley); John Hollerbach (University of Utah); Seth Hutchinson (University of Illinois at Urbana-Champaign); Leslie Kaelbling (MIT); Vijay Kumar (University of Pennsylvania); Matt Mason (Carnegie Mellon University); Gaurav Sukhatme (University of Southern California); Sebastian Thrun (Stanford University); and Jeff Trinkle (RPI).

Note: The details of this workshop series will be posted when available; please email ccrfp[at]cra.org with a request to be notified.

Institute of Technology (3rd place).

In 2007, winners of the poster awards were entered into the national ACM Grand Finale for the Student Research Competition (SRC).

Tapia 2009 Conference: Building on Past Success with an Expanded Vision

The Tapia 2009 Conference Chair, Nina Berry, envisions a scope for the conference that will build on the strengths of the conference’s history, include the new programs offered in 2007, and expand the range of participants and the scope of presentations.

“In addition to building upon the foundation established at the 2007 events, in April 2009 we will highlight the diversity of the people behind the technologies that have driven the industry for numerous years.”

The Tapia Celebrations include plenary invited speakers, papers, panels, bird-of-feather sessions, the Doctoral Consortium, a poster session, the Robotics Competition, and several networking events, such as the awards banquet. National leadership has always been a hallmark of the conference. Invited speakers to date include: Jan Cuny, Program Director, Broadening Participation in Computing, NSF; Mark E. Dean, IBM Fellow and Vice President, IBM Almaden Research Center; Thomas M. Guerrero, Assistant Professor, M. D. Anderson Cancer Center; Norman Johnson, Chief Scientist at Reference Systems; John Leslie King; Vice Provost for Academic Information, University of Michigan; Maria Klawe, President, Harvey Mudd College; Anne Kuhn, Director of IT Security, Walt Disney Parks and Resorts; Shirley Malcom, Head of the American Association for the Advancement of Science; Director for Education and Human Resources Programs; and Warren M. Washington of the National Center for Atmospheric Research and former chair of the National Science Board.

The Tapia 2009 Conference Committee is pleased to announce that Hector Garcia-Molina from the Departments of Computer Science and Electrical Engineering at Stanford University will give the Ken Kennedy Distinguished Lecture.

The conference would not take place without the sponsors—ACM and IEEE-CS; the coordination through the CDC; and the many Platinum, Gold, Silver, Bronze, and Contributing supporters. The Tapia 2009 Conference supporters included 33 institutions from academia, industry, and the government that provided funding for student scholarships and conference activities, and participated in a “Pathways to Career Opportunities” where they provided information on graduate school opportunities, summer internships, faculty fellowships, post-doctorate internships, and employment.

Stay Updated!

Information about the Tapia Celebration is posted to the Website, www.richardtapia.org. Visit the Website and sign up for the mailing list to receive the Call for Participation and registration information for the Tapia 2009 Conference, April 1-4, 2009.

Ann Redel is a member of the Tapia 2009 Conference Committee and the Co-Program Manager of the Empowering Leadership: Computing Scholarships of Tomorrow Alliance, an NSF Broadening Participation in Computing-Alliance led by Richard A. Tapia.
approach ensures that users across the country will be able to use Blue Waters to its fullest potential. It will be essential to scale scientific and engineering codes to take full advantage of the power of Blue Waters, enabling researchers to effectively exploit hundreds of thousands of processors. NCSA and its partners will collaborate with scientists on porting, revising and rewriting, and optimizing the performance and scalability of existing applications. As well, they will develop new applications that describe complex natural and engineered systems, such as hurricanes and climate change, critical to the nation. Petascale Application Collaboration Teams will utilize software, technology, and expertise from NCSA, the University of Illinois, IBM and the Great Lakes Consortium with application developers, pooling their expertise. The far-reaching educational and workforce development program connected with Blue Waters will impact students from K-12 through postgraduate education. In addition to geographical areas and populations underrepresented in supercomputing, At the undergraduate level, the program will educate the next generation of graduate students, K-12 teachers, future technical staff, and the informed public. At the graduate and postgraduate levels, the program will educate and train the next generation of researchers.

Enabling Scientific Breakthroughs

NCSA’s powerful computers enable thousands of scientists to “see” beyond the reach of the most sensitive observational instruments. Backed by NCSA’s computing and software, technology, and expertise, these researchers investigate fundamental questions such as how the human body functions at the molecular level, how the universe evolved in the moments after the Big Bang, and how atmospheric forces create deadly storms. At the undergraduate level, the program will educate the next generation of graduate students, K-12 teachers, future technical staff, and the informed public. At the graduate and postgraduate levels, the program will educate and train the next generation of researchers.

To Tap Resources Effectively

Of course, in many fields it takes more powerful computers to enable productive research. Scientists and engineers must be able to effectively exploit data sources and computers and computing resources that are distributed across the nation (indeed, sometimes around the world). To that end, NCSA develops cyber-environments that integrate desktop and high-performance computing, enabling researchers to intuitively manage their work and to access remote data and computational resources. For example, NCSA and the Mid-America Earthquake Center have collaboratively developed a tool, called MAEviz, that integrates a broad spectrum of data and analysis to help earthquake engineers and policymakers assess the physical, social, and economic impacts that would be caused by an earthquake. MAEviz enables metropolitan areas threatened by earthquakes to better prepare for such events. It is being used in earthquake-prone locations such as Turkey, Pakistan, and Memphis, Tennessee.

NCSA also develops tools such as Tulip and the Cyberintegrand, to address challenges in the management of data history, metadata, and long-term data preservation.

Ensuring Cybersecurity

Researchers, educators, students, and our government and business partners must be able to access NCSA’s computing resources from sites across the nation and around the world. That openness is essential, but it is also a vulnerability. NCSA staff have developed broad and deep expertise in detecting and responding to cyber-attacks and intrusions. The center is a recognized leader in both site security and security for distributed systems, and has developed new software to help protect computing systems and their users from malicious attacks. NCSA also has a history of collaborating with law enforcement professionals to respond to and investigate intrusions and attempted attacks here and elsewhere. For example, NCSA collaborated with the Illinois Terrorism Task Force to help test and deploy secure smartcard ID technology for emergency first-responders. Recently, the center launched the National Center for Digital Intrusion Response, which actively integrates the FBI’s law enforcement investigative expertise with the technology and engineering acumen of NCSA’s recognized computer security and incident response personnel.

Driving Economic Growth

NCSA gives its business and industrial partners a competitive edge by providing access to high-tech innovations and problem-solving expertise. Some of the nation’s leading companies have leveraged NCSA tools and technologies to gain competitive advantage. Our partners say that NCSA’s unique capabilities merge basic and applied research to solve real-world problems. For example, Eli Lilly worked with NCSA to develop treatments tailored to the 3D structures of molecules and enzymes. NCSA helped Caterpillar use virtual prototyping to slash the amount of time required to design and evaluate new products. NCSA developed data-mining software that enabled Sears to analyze point-of-sale procedures and pinpoint fraudulent transactions, reducing costs, increasing revenue, and improving staff efficiency. Current NCSA collaborators include: ACNielsen, Boeing, Caterpillar, John Deere, Dell, ExxonMobil, IBM, JPMorgan, Microsoft, Motorola, Rolls-Royce, and State Farm.

Technologies that were first developed at NCSA have also been transferred to the marketplace—the most famous example, of course, is NCSA Mosaic, the first widely available graphic web browser. When NCSA developed Mosaic in the early 1990s, the Internet was used by only a small number of academic and government institutions. Within a year of Mosaic’s release, several million people were using the free software to find information on the Web. The seminal software spawned both Netscape (founded by NCSA alumni) and Internet Explorer (which licensed Mosaic), and today the Web is a ubiquitous tool of communication and commerce.
Allegheny College Department of Computer Science Tenure-Track Position

The Department of Computer Science invites applications for a tenure-track position beginning Fall 2008. Qualifications include PhD in computer science. Applicants with interests in graphics, multimedia, computing science, and data management are preferred; however, candidates from other areas of computer science will be considered.

Applicants must provide evidence of ability to teach effectively at the undergraduate level, commitment to liberal arts education, and continuing contribution to the discipline. Responsibilities include teaching and advising undergraduates, guiding students in senior research projects, and contributing to the undergraduate freshman/sophomore seminar. Emphasis on speaking and writing. Salary will be competitive; startup funds are available. Rank will be commensurate with credentials and experience.

Allegheny College is a highly selective private liberal arts college with a dedicated faculty of teaching scholars. The Department and its traditional and applied computing majors is available on the Web at: http://cs.allegheny.edu

Send letter of application, vita, statement on teaching and research interests, applicable transcripts, and arrange to have three letters sent from references, to: Dr. Robert S. Ross, Associate Professor and Chair, Department of Computer Science, Allegheny College, Meadville, PA 16335. Review of applications will begin immediately.

Allegheny College is an Equal Opportunity/AA/Title IX Employer. Applications from women and members of other underrepresented groups are especially encouraged by Allegheny.

Clarksorn University Department of Computer Science Tenure-Track Position

Prof. P.C. Turner
Mathematics and Computer Science
Clarkson University
Potsdam, NY 13699-5815

CUNY York College Mathematics and Computer Science Department Tenure-Track Position

The Mathematics and Computer Science Department anticipates the filling of a full-time, tenure-track position at the rank of Assistant Professor to begin September 1, 2008. The position includes teaching computer science courses, participating in department and college committees and in service activities, and fulfilling other activities appropriate to rank.

Ph.D. in Computer Science or closely related field, college teaching experience and a strong commitment to undergraduates, and an active research agenda required. Women and candidates from all areas of computer science will be considered. Salary is commensurate with rank as qualifications, salary history and experience.

Visit the York College website (www.york.cuny.edu) to discover more about this exciting opportunity. For information regarding this position, please see http://www.york.cuny.edu/hr/jobs; apply by the position-specific deadline.

CWI, Centrum Wiskunde & Informatica
Probability, Networks and Algorithms Department
Tenure-Track in Algorithmic Game Theory & Positional Games Design

CWI, Amsterdam, The Netherlands, invites applications for a tenure-track position in Algorithmic Game Theory and or a positional game in Mechanism Design within the group PNAI: Algorithmic Computation, Combinatorial Optimization'.

For further information, please see: http://www.cwi.nl/jobs

DePaul University School of Computer Science, Telecommunications and Information Systems
Tenure-Track Position in Information Assurance

The School of Computer Science, Telecommunications and Information Systems (CITS) at DePaul University invites applicants for a full-time, tenure-track position in one of the most comprehensive and future-oriented information assurance programs in the country.

Located in the heart of Chicago’s Loop, the Information Assurance Program touches on all aspects of security: organizational, networking, and software development. There are currently over 100 majors enrolled in the BS and MS degree programs. DePaul University is a NSA/DHS Center on Cyber Security, and a National Science Foundation CyberCorps Site.

Candidates for this position will have a strong interest and experience in information assurance, and will be interested in undergraduate and graduate students with specializations in all areas of information assurance to apply. We are particularly interested in candidates with specializations in audit compliance, risk management and information security management. Any terminal degree and equivalent experience with advanced knowledge in this area are encouraged, along with an appropriate focus on information assurance.

For more information, please go to: http://www.depaul.edu/socs/it/news/jobs.htm

Eidgenössische Technische Hochschule Zurich
Swiss Federal Institute of Technology Zurich
Professor for Computer Science/Informatics

ETH Zurich invites applications for a full professor position in Computer Science/Informatics (Computer Systems). The successful applicant is someone who can:· bind the gap between theoretical systems and hardware; systems. Applications are solicited from candidates with exceptionally recognized research credentials and proven teaching ability. He or she should be able to teach computer architecture, system design, performance evaluation, digital design, and system programming in the B.S. and M.S. programs. Courses at Master level may be taught in English. We expect a well established track record in research. The candidate’s research focus can be on Performance Evaluation, Embedded and Mobile Systems, Multicore/ Multicore Systems, Dependable Systems, Fault Tolerant Computing, Real-time Systems, Custom Computing, Support for Streaming and Continuous Media, or System Architecture.

Please submit your application together with a curriculum vitae, a list of publications, the names of at least three referees, and a short overview of the research interests to: Prof. Dr. R. Eichler, Rämistrasse 101, ETH Zurich, 8092 Zurich, Switzerland no later than April 30, 2008.

For further information, candidates may contact the Head of the Department, Prof. J. Gutknecht (gutknecht@inf.ethz.ch).

FX Palo Alto Laboratory, Inc (FXPAL)
Research Scientist Positions

FX Palo Alto Laboratory, Inc (FXPAL) provides multimedia and collaboration technology research for Fujitsu Xerox Co., Ltd., a joint venture between Fujitsu Corporation of America and Fujifilm of Japan. We currently have immediate openings for Research Scientists with expertise in:

1. Immersive Virtual Environments. We are developing applications for virtual worlds and are seeking expertise in VRml technologies, such as simulation 3D modeling, procedural 3D graphics, real time motion graphics, and distributed computation. Job code CRN/1

2. Large Scale Parallel and Distributed Systems. We are developing distributed virtual collaboration and multimedia systems, including Web-based tools, and networked applications running on everything from cell phones and PDAs to laptop and desktop computers. Requirements include programming experience with parallel programming, large scale storage systems and multimedia databases, distributed programming tools, and network programming protocols. Job code CRN/2

3. Document Image Analysis. Our goal in this project is to study and solve a variety of problems in the structure and content of scanned documents such as forms, brochures, and other complex office documents. Experience in computer vision or image processing and analysis work is helpful. We plan to use some probabilistic model based approach and machine learning techniques. We also want to explore parallel algorithms, since speed is critical for our task. Job code CRN/3

The candidates should be interested in working on practical applications in a collaborative environment. All positions require a Ph.D. in Computer Science or related field, strong development skills and excellent publication track record.

For more information about FXPAL, please visit our website at: www.fxpal.com

To apply send resume referencing appropriate job code to: fxpalresumes@fxpal.com

We are an equal opportunity employer and value diversity in the workplace.

Georgetown University Department of Computer Science Senior Faculty Position and Chair of Department

The Department of Computer Science seeks a dynamic scholar teacher for a senior faculty position in the department. It is expected that within a short time of appointment this new faculty member will assume the duties and responsibilities of department chair. With the addition of the department’s first graduate degree program in 2007, the department chair will be instrumental in continuing the department’s mission for computer science at Georgetown University, while also developing degree programs and elevating the stature of the department. As such, the individual selected must have an international reputation as an scholar, experience as a successful teacher, and demonstrated leadership ability. Subject to review by the Georgetown University Board of Faculty and Tenure, this position will be a tenure appointment at the full Professor level. The department consists of 7 full-time faculty members, 5 adjunct faculty members, and a full-time administration coordinator. Review of applications and nominations will be ongoing until the position is filled. Candidates from all areas and sub-disciplines of computer science and related areas are encouraged. Applications and nominations should arrive no later than November 15th. The department is interested in faculty members who are in algorithms, artificial intelligence, databases, data mining, nonconventional computing, and software engineering. Please visit the department’s website for additional information:

http://www.cs.georgetown.edu

Also direct specific questions to: Brian Blake at Blakeb@georgetown.edu

Please send cover letter, curriculum vitae, research/teaching statements, and the names of 3 references to:

Dr. M. Brian Blake
Department of Computer Science
Georgetown University
35th and C Street, NW
3rd Floor St. Mary’s Hall
Washington, DC 20057-1232

Georgetown University is an Equal Opportunity/Affirmative Action Employer. We are committed to creating an open, diverse, and inclusive environment that values and encourages community and engagement with different individuals who will help us achieve this mission.

Harvard University Center for Research on Computation and Society Postdoctoral Fellows Program

CARES, the Center for Research on Computation and Society solicits applications for postdoctoral fellows for the 2007-2008 academic year. Fellows are given an annual stipend of $35,000 for up to three years to work on original research, and provided with additional funds for travel and research support.
Harpole Professorship in Engineering

Visiting Assistant Professor Position

Hendrix College

Computing Research News March 2008

eligible for appointment at the tenured full
mentoring, and professional/institutional research, graduate student supervision and undergraduate and graduate education, de-
especially in:

upon receipt.
courses a year, distributed across all under-
welcome.
Candidates from all research specialties are welcome.
computer science, starting Aug 2008. An application deadline for full

Candidate's research should be consistent with the focus areas of Privacy and Security. This
year, we are broadening our search to add additional areas to our computing and Society including that not limited to:
• Health and Medical Computing
• Intrusion Detection Systems
• Privacy and Security

For the coming year we are especially interested in candidates whose work has a connection with the development of systems in health care. Given the priority of the Center for Systems to get researchers for judging interdisciplinary inclusiveness, desire to work with both computer science and graduate students in their research, and demonstrate interest in con-

Hendrix College

Department of Mathematics & Computer Science

Waiting Assistant Professor Position

Hendrix College, a central Arkansas liberal arts college, announces a Year, fulltime, non-tenure-track position in computer science, starting Aug 2008. An M.S. is required, a Ph.D. is preferred. Candidates from all research specialties are welcome.

Responsibilities include teaching five courses a year, distributed across all under-
graduate levels, and directing undergradu-
ate research. Applications will be reviewed upon receipt.

Full information at

Hendrix College

Iowa State University

Department of Electrical and Computer Engineering

Haplo Professorship

The Electrical and Computer Engineering Department at Iowa State University is accepting applications from outstanding candidates for the Haplo Professorship in all core areas of expertise in Electrical or Computer Engineering, especially in:

• Computer engineering with empha-
sis on embedded systems;
• VLSI with emphasis on controlling
women and underrepresented groups to partic-

We seek candidates from widely diverse backgrounds, including industrial and academic.
Mathematical and computational experi-
ence and excellence required, including
superb C++ skills in Linux or Unix
environment. Biology training helpful but
not required as our learn the job.
Outstanding oral and written communica-
tion skills, joy in teamwork. A group leader
position is also possible.

MIT and Harvard

The Broad Institute

Computational Biology Position

Apply your computing skills to DNA

The Broad Institute of MIT and Harvard has an intense, exciting environ-
ment, with a wide range of critical problems in biology and medicine. Come join us.

More information at

The Broad Institute

Are you a creative educator and researcher looking for a welcome change of scenery? Are
you eager to make your personal mark in advancing knowledge and professional practice in
an outstanding teaching environment? Do you see yourself working as part of a highly
innovative and productive community?

Ryerson University has an employment equity program and encourages applications from all
candidates, including women, visible minorities, aboriginal peoples, and persons with disabilities.

Ryerson University has an employment equity program and encourages applications from all
candidates, including women, visible minorities, aboriginal peoples, and persons with disabilities.

Are you ready to work with cutting-edge DNA
technology?

We find biomedical applications for
dNA sequencing instruments yielding billions of short DNA sequences like:

TTTTGTTAATG

TTTTTATTAA

TTTTTATTTA

...and sustain a productive externally funded research program, and strong leadership
ability and sustained excellence required, including
superb C++ skills in Linux or Unix
environment. Biology training helpful but
not required as our learn the job.

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innovative and productive community?
Stony Brook University’s Department of Computer Science seeks a Postdoctoral Associate. The Lydia project builds a relational model of people and things through natural language processing of news sources and the statistical analysis of entity frequencies and co-locations. This model can be used to identify trends and other information flows through this entity network. Please visit http://wwwategoricals.org to analyze an agent model and blog postings obtained from more than 500 daily online news sources. A two-year postdoctoral position is now available at Stony Brook (join our team). The applicant should have a background in one of the following: (1) natural language processing or artificial intelligence, (2) text mining or data mining, (3) algorithm and the science of networks, or (4) data analysis or visualization. Computational linguistics, pattern recognition and the quality of our analysis, and help manage a team of roughly ten graduate students as we shift beyond technological components towards the question of how to best exploit it. As per sponsor requirements, applicants must be U.S. citizens or hold or will soon hold a Ph.D. in computer science, linguistics, economics, or any related field. Applications will be accepted. Selection is competitive. http://www.categoricals.org/儿

For more information and to apply online visit www.stonybrook.edu/jobs or send your vita and contact information to Steven Stima Department of Computer Science, Stony Brook University, SUNY, Stony Brook, NY 11794-4300 Equal Opportunity/Alternate Action Employer.
Faculty will participate in all levels of the College’s mission, which includes undergraduate through doctoral education. Priority will be given to applicants with a strong commitment to diversity (as defined by the University). Potential teaching and research programs and the interplay between them. Details concerning the college’s re- search mission, its mission to diversity, and new faculty members are available at: http://www.albany.edu/ci/portfolio.shtml. For information about the College, please visit our website at: http://www.albany.edu/cci. Application online, using Interview Exchange at: http://hr.albany.edu/content/faculvac.asp. Application review will begin on February 8, 2008; position open until filled. Position available August 2008. The University at Albany is an EEO/ AA/I/ADA employer.

University of British Columbia Department of Computing Science Canada Research Chair The Department of Computer Science at the University of British Columbia is seeking candidates to nominate for a Tier II Canada Research Chair (CRC). The CRC program is available to outstanding researchers who are world leaders or who have the potential for world leadership in their fields. It is expected that the can- didate would typically have between two and ten years of research experience since obtaining their Ph.D. The Department’s nomination is subject to approval by the CRC program. At the time of nomination, the candidate will be appointed to a tenured or tenure- track position in the Department of Computer Science.

Further information about the CRC program may be found at: http://www.chairs.gc.ca

The start date is negotiable, but is nominally September 1, 2008.

Successful candidates will be expected to pursue an active research program, perform both graduate and undergraduate teaching, and supervise graduate students. Accordingly, applicants must demonstrate an exemplary record of potential for excellence, in research and teaching. The Department of Computer Science invites candidates with a research focus in one of the following areas:

(a) Algorithms and complexity, cryptography, and quantum computing;
(b) Databases, data mining, and data management;
(c) Artificial intelligence, learning, and natural language processing;
(d) Software engineering and systems; and
(e) Operating systems and security.

Applications for tenure-track positions will be considered for assistant professor rank; applications for tenured or tenure- track positions will be considered for associate or full professor rank.

University of Connecticut Computer Science Tenure-Track Faculty Positions Faculty in the Computer Science Department at the University of Connecticut invites applications for 10 tenure- track Faculty Positions across five areas of research: algorithms, graphics, networking and communications, software engineering, and database systems and applications. The University of Connecticut is a medium- sized (11,000 student) private university. Class size is small (150 maximum, teaching load is moderate, and the salary is competitive. The university is located 21 miles from the State’s capital, 5 miles from downtown New Haven, and 10 miles from the Connecticut Shoreline. The 14,000-foot peaks of the Connecticut Rocks are only one hour away. The University of Connecticut is committed to enhancing the diversity of its faculty and staff and encourages applications from individuals from women, minorities, and disabled. A complete list of positions is available at: http://www.albany.edu/cci.

Applications will be accepted until the position is filled. Applicants should submit a cur- rent vitae, a statement of teaching and research interests and have at least 3 refer- ence letters to: http://albany.interviewexchange.com/

Review of applications will begin im- mediately, and continue until the position is filled.

The University of Connecticut is an AA/EOE workplace.

University of Southern California Computer Science Department Faculty Position Applications are invited for one full professor position (team leader) to join the Computer Science Faculty within the Information Sciences Institute. This position is funded by a major grant from the National Science Foundation. Initial interviews will begin immediately, and continue until the position is filled.

Applications should be submitted online at: http://www.hr.ucsc.edu/positions/11515.htm

Applications must include: the completed application form; a CV; a statement of research and teaching interests as well as goals; a statement of the candidate’s vision for the future of the Computer Science Department at the University of Southern California; a list of publications; a list of teaching and research experiences; and three letters of recommendation.

University of Texas at Arlington Computer Science and Engineering Tenure-Track Faculty Positions The University of Texas at Arlington, Department of Computer Science and Engineering, invites applications for one or more full-time, tenure-track appointments in the Computer Science Department, starting in August 2008. The Department of Computer Science and Engineering has 11 full professors and approximately 50 graduate students. The faculty is organized into four academic research groups: computer systems and computer architecture; computer security and networking; computer graphics, computer vision, and multimedia; and intelligent and information systems.

Candidates must have a PhD in computer science or a related field. Applicants must have demonstrated excellence in teaching and/or research. Applicants must have an active research program as demonstrated by publications, grants, or significant contributions to the field. Ph.D. candidates should have completed all requirements for the Ph.D. degree at the time of appointment.

The Department of Computer Science and Engineering at The University of Texas at Arlington is committed to the principle of Equal Employment Opportunity for all employees and students. The University of Texas at Arlington is an Affirmative Action/Equal Opportunity Employer.

Applications should be submitted online at: http://www.hr.ucsc.edu/positions/11515.htm

Applications must include: the completed application form; a CV; a statement of research and teaching interests as well as goals; a list of recent research publications; a list of teaching and research experiences; and three letters of recommendation.

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The Department of Computer Science and Engineering at The University of Texas at Arlington is committed to the principle of Equal Employment Opportunity for all employees and students. The University of Texas at Arlington is an Affirmative Action/Equal Opportunity Employer.

Applications should be submitted online at: http://www.hr.ucsc.edu/positions/11515.htm

Applications must include: the completed application form; a CV; a statement of research and teaching interests as well as goals; a list of recent research publications; a list of teaching and research experiences; and three letters of recommendation.
Review of applications will begin 1 December 2008 and continue until the position is filled.
The University of Tulsa is an Equal Opportunity/Affirmative Action Employer.

University of Washington

The Information School
Tenure Track Faculty Position - Human-Computer Interaction

The Information School of the University of Washington is seeking an outstanding individual to fill a tenure-track position in the area of Human-Computer Interaction (HCI).

One new colleague will join a broad-based Information School with biglaw, masters and doctoral academic programs. Applicants must have a Ph.D. or equivalent degree by date of appointment.

Review of applications will begin immediately and continue until the position is filled. The University of Washington is building a culturally diverse faculty and strongly encourages applications from women and members of historically underrepresented groups.

The University of Washington is an Equal Opportunity/Affirmative Action employer, and is committed to affirmative action and diversity in the workforce.

Candidates must have a Ph.D. or equivalent degree and a record of research in fundamentals of computer science, cognitive science, or computer neuroscience to include genomic research, or a closely related area.

Applicants should demonstrate a capacity for building a sustainable research program and exhibit a commitment to excellence in teaching.

The University of Tulsa is a private, comprehensive university with 3000 undergraduate and 1400 graduate students and a student to faculty ratio of 11:1. Tulsa is a large urban community with several world-class museums, a zoo, and an aquarium. Tulsa's performing arts community includes the Civic Center, opera, philharmonic orchestra, and Theatre Tulsa. The Tulsa Performing Arts Center regularly hosts Broadway productions and acts of international repute. Tulsa has many easily accessible lakes and recreational areas and a low cost of living, and excellent public and private schools.

To apply, send a CV, statement of research and teaching interests, reprints, and three letters of reference to: John Hale, Neuroscience Search Committee Chair Department of Computer Science and Engineering The University of Tulsa

800 Tucker Drive
Tulsa, Oklahoma 74104
john.hale@utulsa.edu

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Computer Science: The Transformative Science of Our Age

Computer Science is the transformative science of our age. Its principles are increasingly fundamental to many disciplines. We face ubiquitous opportunities to transform and unify other fields. We provide the engine and many of the ideas that drive innovation and discovery in virtually all disciplines, from science, engineering and medicine to marketing, fine arts and humanities. This year’s Snowbird will explore this theme and the implications it has for what we teach and where our research will lead the world.

Sunday, July 13

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30AM - 2:45PM</td>
<td>CRA Board of Directors Meeting (begins Saturday 6PM)</td>
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<tr>
<td>2:00PM - 7:30PM</td>
<td>Conference Registration</td>
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<tr>
<td>3:00PM - 5:30PM</td>
<td>Workshop for New Department Chairs</td>
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<tr>
<td>Co-Chairs:</td>
<td>Susanne Hambrusch (Purdue University)</td>
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<td></td>
<td>Darrell Whitney (Colorado State University)</td>
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<td></td>
<td>Jean Ferrante (UC San Diego)</td>
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<td>Diane Souvaine (Tufts University)</td>
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<td>Robert Walker (Kent State University)</td>
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<td>Xiaodong Zhang (Ohio State University)</td>
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<tr>
<td>Welcome</td>
<td>Reception</td>
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<td></td>
<td>Dinner</td>
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<tr>
<td></td>
<td>Speaker: Shree Nayer, Ph.D.</td>
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<td></td>
<td>Department of Computer Science, Columbia University</td>
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<td>“Computational Cameras: Redefining the Image”</td>
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Monday, July 14

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00AM - 8:30AM</td>
<td>Breakfast Buffet</td>
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<tr>
<td>7:30AM - 6:00AM</td>
<td>Registration</td>
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<tr>
<td>8:30AM - 8:40AM</td>
<td>Welcome</td>
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<tr>
<td></td>
<td>Speakers:</td>
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<tr>
<td></td>
<td>J Strother Moore, University of Texas at Austin (Academic Snowbird Chair)</td>
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<td></td>
<td>Marek Rusinkiewicz, Telcordia Technologies (Labs/Centers Snowbird Chair)</td>
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<td>Hank Korth (Lehigh University)</td>
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<td>Dorothy Wilkes (Ohio State University)</td>
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<td>Steve Skiena (New York University)</td>
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<td>Natalie Glance (Intelliseek Applied Research Center)</td>
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<td>Holly Yanco (UMass, Lowell)</td>
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<td>Chair: TBA</td>
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<td></td>
<td>Speaker: Dr. Steve Skiena (New York University)</td>
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PLENARY SESSION I

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:40AM - 10:00AM</td>
<td>Innovation in the Knowledge Economy</td>
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<tr>
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<td>Chair: Cita Tufan (NIST)</td>
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<td>Speaker: Irving Wadusswky-Berger (MIT)</td>
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<tr>
<td>Break</td>
<td>10:00AM - 10:30AM</td>
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Workshop I (three parallel sessions) 10:30AM - Noon

New NRC Rankings and the Taubbee Report

| Speakers: | Stuart Zweben (Ohio State University) |
|           | Charlotte Kuh (NRC Policy and Global Affairs Division) |

Paper and Proposal Reviews: Is the Process Flawed?

| Chair:     | Ellen Zegura (Georgia Tech) |
|           | Chip Elliott (BBN)         |
|           | Susan Graham (UC Berkeley) |
|           | Maureen Bigger (Georgia Tech) |
|           | Mark Snir (University of Illinois, Urbana-Champaign) |
|           | Chris Stephenson (Computer Science Teachers Association) |

PLENARY SESSION II

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:30PM - 3:00PM</td>
<td>Industrial Hiring Expectations: The Big Picture</td>
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<td>Chair: Alan Halevy (Google)</td>
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<td></td>
<td>Speaker: Alan Eustace (Google)</td>
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<td></td>
<td>Eric Grimson (MIT)</td>
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<tr>
<td>Break</td>
<td>3:00PM - 3:30PM</td>
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</table>

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

Defining the Computer Science in Biomedical Informatics: Opportunities for CS Research in Biomedical Domains

| Co-Chairs: | Edward Shortliffe (University of Arizona)                            |
|           | Seshumaran (Panchanathan (Arizona State)                             |
|           | Ahn Butte (Stanford University)                                      |
|           | Jim Karkanas (Microsoft Research)                                   |
|           | Peter Szolovits (MIT)                                               |
| Industry/Academic Partnerships | Gabby Silverman (CA Labs)                                      |
|             | Hau-Ai Muller (University of Victoria, Canada)                      |
|             | Helen Meng (The Chinese University of Hong Kong)                   |
|             | Josep Lluís Lumbreras (Spain) (The Polytechnic University of Catalunya, Barcelona) |

Preliminary Program

Innovative Undergraduate Curricula

| Chair:       | Mark Guzdial (Georgia Tech)                                         |
|             | Speakers: Merrick Furst (Georgia Tech)                             |
|             | Deepak Kumar (Bryn Mawr)                                            |
|             | Lynn Steyn (Olin College)                                           |
|             | Andre van der Hoek (UC Irvine)                                      |

Practical Solutions to a Continuing Problem: Sexual Harassment and Gender Discrimination

| Chair and Speaker: | Susanne Hambrusch (Purdue University) |
|                    | Speakers: Eric Grimson (MIT) |
|                    | Maria Klawe (Harvey Mudd College) |
|                    | Valerie Taylor (Texas A&M) |

Dinner and State of the CRA Address 6:30PM - 9:00PM

| Presentations: | CRA’s Distinguished Service Award by CRA Board Chair |
|               | CRA’s Habermann Award by CRA Executive Director |
|               | Speakers: Dan Reed (CRA Board Chair) |
|               | Andrew Bremen (CRA Executive Director) |

Tuesday, July 15

Breakfast Buffet 7:00AM - 8:30AM

PLENARY SESSION III

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<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30AM - 10:00AM</td>
<td>Computing Research Funding: The Federal Picture</td>
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<td>Chair: Andrew Bremen (CRA)</td>
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<td></td>
<td>Speaker: Jeannette Wing (NSF CISE)</td>
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<tr>
<td>Break</td>
<td>10:00AM - 10:30AM</td>
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</table>

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

Communicating the Excitement of CS: K-12 Outreach Practices

| Chair:       | Eric Grimson (MIT)                                                  |
|             | Speakers: Maureen Bigger (Georgia Tech)                             |
|             | Mark Snir (University of Illinois, Urbana-Champaign)               |
|             | Chris Stephenson (Computer Science Teachers Association)            |

Graduate School Immigration and Emigration

| Chair:       | Kim Bruce (Pomona College)                                          |
|             | Speakers: Randa Nelson (University of Rochester)                   |
|             | Mor Harchl-Balter (Carnegie Mellon University)                     |
|             | Jeff Klingner or Adam Beegun (Stanford University)                 |

Research on a Small Scale

| Chair and Speaker: | Karen T. Sutherland (Augusta College) |
|                    | Speakers: Ishwari Sethi (Oakland University) |
|                    | Holly Yanco (UMass, Lowell) |

Wikinomics & Researchnomics: Accelerating CS Research

| Chair:       | David Tenhousen (New Venture Partners, LLC)                        |
|             | Speakers: TBD                                                      |

Luncheon Noon - 1:30PM

Hot Topics 1:30PM - 2:30PM

| Chair:       | David Notkin (University of Washington)                            |
|             | When you had asked a question at a session? When you had run a session? When you had planned something? Who has something to say? Who needs to hear something? What do you feel you need to say? Who else should hear your ideas? What do you want to be sure to say? |
|             | Break                                                                  |

PLENARY SESSION IV

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2:30PM - 4:00PM</td>
<td>Computing Community Consortium</td>
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<tr>
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<td>Chair and Speaker: Ed Lazowska (University of Washington)</td>
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<td></td>
<td>Speakers: Susan Graham (UC Berkeley)</td>
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<td></td>
<td>Chip Elliott (BIBN)</td>
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<td></td>
<td>Ellen Zegura (Georgia Tech)</td>
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Workshop for IT Deans 4:00PM - 9:00PM

| Chair:       | Bobby Schnabel (Indiana University)                                  |
|             | Workshops and Registration Information http://www.cra.org/snowbird |

Wednesday, July 16

3:00PM - 5:30PM

Defining the Computer Science in Biomedical Informatics: Opportunities for CS Research in Biomedical Domains

| Co-Chairs: | Edward Shortliffe (University of Arizona)                            |
|           | Seshumaran (Panchanathan (Arizona State)                             |
|           | Ahn Butte (Stanford University)                                      |
|           | Jim Karkanas (Microsoft Research)                                   |
|           | Peter Szolovits (MIT)                                               |
| Industry/Academic Partnerships | Gabby Silverman (CA Labs)                                      |
|             | Hau-Ai Muller (University of Victoria, Canada)                      |
|             | Helen Meng (The Chinese University of Hong Kong)                   |
|             | Josep Lluís Lumbreras (Spain) (The Polytechnic University of Catalunya, Barcelona) |