

COMPUTING RESEARCH NEWS

A Publication of the Computing Research Association

March 2008

Vol. 20/No. 2

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 08 budget levels will fund 1,000 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,

Science Increases Abandoned
Continued on Page 4

Inside CRN

Expanding the Pipeline.....	2	Computing Community Consortium..	5
CISE AD Column	3	Professional Opportunities.....	7
Musings from the Chair.....	3	Snowbird Preliminary Program	12
CS Bachelor's Degrees.....	4		

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.cra.org/reports/labs>.

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

National Center
for Supercomputing
Continued on Page 6

NONPROFIT ORG.
U.S. POSTAGE
PAID
WASHINGTON, DC
PERMIT NO. 993

CRA
1100 Seventeenth Street, NW
Suite 507
Washington, DC 20036-4632

Computing Research Association

Board Officers

Daniel A. Reed
Chair
Microsoft Research

Lori Clarke
Vice Chair
University of Massachusetts

Carla Ellis
Secretary
Duke University

Philip Bernstein
Treasurer
Microsoft Research

Board Members

Annie I. Antón
North Carolina State University

William Aspray
Indiana University

Andrew A. Chien
Intel Corporation

Anne Condon
University of British Columbia

George V. Cybenko
Dartmouth College

Richard A. DeMillo
Georgia Institute of Technology

Marie desJardins
University of Maryland,
Baltimore County

Eric Grimson
Massachusetts Institute of
Technology

Mary Jean Harrold
Georgia Institute of Technology

Laura M. Haas
IBM Almaden Research Center

Michael Jones
Microsoft Research

Norman Jouppi
Hewlett Packard

Peter Lee
Carnegie Mellon University

J Strother Moore
University of Texas at Austin

David Notkin
University of Washington

Martha E. Pollack
University of Michigan

Jennifer Rexford
Princeton University

Robert Schnabel
Indiana University

Fred B. Schneider
Cornell University

Marc Snir
University of Illinois
at Urbana-Champaign

Robert F. Sproull
Sun Microsystems Laboratories

David Tennenhouse
New Venture Partners

Frank Tompa
University of Waterloo

Moshe Vardi
Rice University

Jeffrey Vitter
Purdue University

Benjamin Wah
University of Illinois
at Urbana-Champaign

Richard Waters
Mitsubishi Electric
Research Labs

Bryant York
Portland State University

Executive Director

Andrew Bernat

CRN Editor

Jean Smith

Affiliate Societies



CACS/AIC

siam.

THE IEEE
COMPUTER
SOCIETY

USENIX

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 and Maxfield-Oshman Professor in Engineering in the Department of Computational and Applied Mathematics at Rice University in Houston, Texas. The conference has a strong focus on the participation of students, providing opportunities for them to discuss their career and research goals with national leaders in computing. Tapia emphasized, "This event celebrates the accomplishments of diverse scholars—from undergraduates through national leaders—in a setting focused on the achievements 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 to 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 HMC Escher team from Harvey Mudd College, including team members Rachel Arce-Jaeger, Vedika Khemani, and Jessica Wen, with faculty advisor Zach Dodds. 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 Fabbro, Angelica Lim, and Kathleen Tsoukalas.

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 Co-chair Nina Berry 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 panelists 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 supporters. 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 biocomputing 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 Leggett's** major advisor, Juan Gilbert, 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 panelists—Valerie Taylor, 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 posters 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 Posters Chair Chuck Koelbel of Rice University, reviewed the posters for technical content and presentation. Graduate student poster awards went to Joy Kamunoyori, University of Virginia (1st place); Tao Cui, Caltech (2nd place); and Talithia Williams, Rice University (3rd place). Undergraduate student poster awards went to Michael Eagle, University of North Carolina-Charlotte (1st place); Jerry Backer, City University of New York (2nd place); Lonnie T. Parker, IV, Georgia

Tapia Celebration
Continued on Page 5

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 co-located, 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 run-time 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, algorithms) does this computational model suggest?
- For technology
 - How can we automatically manage the hardware and software of these systems?
 - How can we reduce their power 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 allocations of the Google-IBM cluster for any new, innovative use of the system and to probe the possibilities and fundamental limits of this new computing paradigm. The emphasis of the program will be to develop new approaches and applications that are outside the typical high-performance 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 "computer" to solve problems unsolvable 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

Message from the CISE AD
Continued on Page 5

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 reduce expectations. NSF in particular expects 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/govaffairs/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 with the funding. This funding is essential to keeping our scientific edge. So I ask Congress to double federal 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 important that your voice be heard if we are to redress 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 image 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-E) 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. I 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 Brown has graciously agreed to serve as the initial chair of the CRA-E 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, I urge you to engage and participate. This is vital.

Dan Reed, CRA's Board Chair, is Microsoft's Scalable and Multicore Computing Strategist. Contact him at Daniel.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 article reports on CS bachelor's degree enrollments and production among Ph.D.-granting departments in the United States since the late 1990s. Data are reported in both total numbers and medians per department as the latter helps limit 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 HERI/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 2005.[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 43 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 before. 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/seind08/vol2.htm
- [2] HERI/UCLA's "CIRP Freshman Survey" is an annual survey of the characteristics of students attending colleges and universities as first-time, full-time freshmen: www.gseis.ucla.edu/heri/cirpoverview.php.
- [3] See www.cra.org/info/education/us/bs.html
Jay Vegso can be contacted at jvegso@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 \$7.7 million for the Oak Ridge Leadership Computing Facility, and the creation of a new "Institute for Advanced Architectures and Algorithms" 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—including a new "research facilities construction" program—and flat-funds the National Institutes of Health.¹

Though the final spending bill essentially reneged 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 embraced 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 doubled 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 Department budget 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://cra.org/blog>.

Computing research is featured prominently in the National Science Foundation request for FY 09. The Foundation-wide 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 capability beyond the physical and conceptual limitations of current systems." 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" that 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 CDI: CISE would contribute over a third of the total NSF 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 is \$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 network facilities and testbeds.

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

Notes:

- ¹ For more on what is funded and isn't funded in the FY 08 omnibus, see "FY 2008 Omnibus: Damage Assessment" on the Computing Research Policy Blog at: <http://www.cra.org/govaffairs/blog/archives/000650.html>

CCC Upcoming Events

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; Jon Kleinberg, Cornell; Ed Lazowska, U. Washington; Marc Najork, Microsoft Research; Raghu Ramakrishnan, Yahoo! Research; Dan Reed, Microsoft Research; Alex Szalay, Johns Hopkins; and ChengXiang Zhai, 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 very limited, facilities for interaction 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 study will generate 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 I. Christensen, PI (Georgia Tech); Oliver Brock (University of Massachusetts); Ken Goldberg (UC Berkeley); John Hollerbach (University of Utah); Seth Hutchinson (University of Illinois at Urbana-Champaign); Leslie Kaebbling (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 [cccrfp \[at\] cra.org](mailto:cccrfp[at]cra.org) with a request to be notified. ■

Tapia Celebration of Diversity in Computing from Page 2

Institute of Technology (3rd place). In 2007, winners of the poster awards were entered into the national ACM Grand Finals 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 2001-2007 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, birds-of-a-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 Referentia Systems; John Leslie King, Vice Provost for Academic Information, University of Michigan; Maria Klawe, President, Harvey Mudd College; Anne Kuhns, Director of IT Security, Walt Disney Parks and Resorts; Shirley Malcom, Head of the American Association for the Advancement of Science Directorate 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 2007 Conference supporters included 31 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, <http://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 Redelfs is a member of the Tapia 2009 Conference Committee and the Co-Program Manager of the Empowering Leadership: Computing Scholars of Tomorrow Alliance, an NSF Broadening Participation in Computing Alliance led by Richard A. Tapia. ■

Message from the CISE AD from Page 3

unavailable to students and faculty today.

Please look for the new solicitation which will be posted on the CISE web site. CISE looks forward to your bold, creative proposals for CluE!

Notes:

- [1] Official Google Blog: <http://google-blog.blogspot.com/2007/10/let-thousand-servers-bloom.html>
- [2] J. Dean and S. Ghemawat, "MapReduce: Simplified Data Processing on Large Clusters," *Comm. of the ACM*, 51(1), January 2008, pp. 107-113.
- [3] http://www.nytimes.com/2006/06/14/technology/14search.html?_r=1&pagewanted=2&oref=slogin
- [4] See http://www.google.com/intl/en/press/pressrel/20071008_ibm_univ.html or <http://www-03.ibm.com/press/us/en/pressrelease/22414.wss> for the text of the press release.
- [5] <http://hadoop.apache.org/>
- [6] <http://labs.google.com/papers/mapreduce.html>
- [7] <http://labs.google.com/papers/gfs.html>
- [8] <http://www.ibm.com/software/tivoli/>
- [9] <http://code.google.com/edu/content/parallel.html> ■

National Center for Supercomputing from Page 1

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 tens to 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 unite researchers and technologists 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, reaching out to geographical areas and populations under-represented 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 the center's computer resources, 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. Examples include:

- Scientists used NCSA's supercomputers to model the spread of a flu virus—including every individual in the United States, every school and workplace, and the journeys people make in their daily lives. Health care providers and policy makers can use this information to put the brakes on a potential epidemic.
- Supercomputers at NCSA and other sites helped researchers develop new methods of locating the source of contaminants in urban water distribution systems.
- NCSA's computers enabled scientists to model every step of the photosynthetic process for the first time. Their simulations identified proteins that could greatly enhance plant productivity.
- Simulations performed at NCSA revealed how HIV protease changes between forms, helping to determine when this "starter molecule" for the virus that causes AIDS is most vulnerable

to new drugs that could derail the disease.

Tools to Tap Resources Effectively

Of course, in many fields it takes more than powerful computers to enable productive research. Scientists and engineers must be able to effectively exploit data sources and stores 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 losses 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 like Turkey, Pakistan, and Memphis, Tennessee.

NCSA also develops tools, such as Tupelo and the Cyberintegrator, 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 cyberattacks 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 smart-card 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 industry 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.

Sharing Knowledge

Research shouldn't languish in the lab; science and engineering insights need to be shared with the widest possible audience. Visualization experts at NCSA transform dry data into artful animations that have been showcased at the American Museum of Natural History, in an Oscar-nominated IMAX movie, in documentaries for PBS NOVA and the Discovery Channel, and at planetariums and theaters around the globe.

The center also helps educators bring advanced technology to the classroom—from elementary schools to universities. NCSA works to improve science education in Illinois schools by providing the state's teachers with hands-on training in the use of the visualization tools and technologies that can bring lessons to life for their students. With the Department of Chemistry, the College of Education, and other educational partners, NCSA recently launched the Institute for Chemistry Literacy and Computational Science to strengthen Illinois teachers' understanding of chemistry and thereby improve chemistry education.

To learn more about NCSA's history, resources, projects, and expertise, go to www.ncsa.uiuc.edu.

Trish L. Barker is a Public Information Specialist at the National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign. ■

New CRA Academic Members

Allegheny College CS
Marquette University CS

New Lab Member

FX Palo Alto Laboratory (FXPAL)

Transitions, Honors, and Awards

Vinton G. Cerf and **Robert E. Kahn** were recently named winners of the Japan Prize in the category of Information Communication Theory and Technology. They were recognized for the creation of network architecture and communication protocol for the Internet. Our congratulations to both. Cerf is Vice President and Chief Internet Evangelist, Google Inc. Kahn, a former CRA board member, is Chairman, CEO & President of Corporation for National Research Initiatives in Reston, VA.

Congratulations to all those who were named IEEE Fellows, effective January 1, 2008. Included were **Ronald J. Brachman**, Yahoo Research, and CRA board member, **David Notkin**, University of Washington. Brachman was honored for leadership in knowledge representation and reasoning in computer science and artificial intelligence. Notkin was named for his contributions to software engineering and software evolution research.

Congratulations to former board members who have recently received recognition. Among those elected to the National Academy of Engineering are **Jim Foley**, Georgia Tech, and **Barbara Grosz**, Radcliffe Institute for Advanced Study and Harvard University. **Ed Lazowska**, University of Washington, has been elected Chair-Elect of the AAAS Section on Information, Computing, and Communication.

CRA's board chair, **Dan Reed**, recently moved to Washington State to become the Scalable and Multicore Computing Strategist at Microsoft Research. Reed was formerly Chancellor's Eminent Professor and Vice-Chancellor for Information Technology at the University of North Carolina at Chapel Hill, and directed the interdisciplinary Renaissance Computing Institute (RENCI). ■

Professional Opportunities

CRN Advertising Policy

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

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 a Ph.D. in computer science. Applicants with interests in graphics, media computation, computational science, or data management and security 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 college-wide freshman/sophomore seminars that emphasize speaking and writing. Salary will be competitive; start-up 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 teacher-scholars. Information about 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 of teaching and research interests, applicable transcripts, and arrange to have three letters sent from references, at least one of whom can comment on teaching, to:

Dr. Robert S. Roos, Associate Professor and Chair

Department of Computer Science
Allegheny College
Meadeville, PA 16335

email: robert.roos@allegheny.edu

Review of applications will begin immediately.

Allegheny College is an Equal Opportunity Employer with a strong institutional commitment to develop a diverse faculty and staff. Women and members of other under-represented groups are especially encouraged to apply.

Clarkson University Department of Computer Science Assistant Professor Position

The Department of Computer Science at Clarkson University (www.clarkson.edu/cs) invites applications for a tenure-track position in computer science at the rank of Assistant Professor starting in August 2008. The department offers BS and MS degrees in Computer Science. We are in the process of developing a PhD in Computer Science.

We are especially interested in candidates with research expertise in applied systems areas such as operating systems, security, networking, parallel and distributed computing, and database systems, or with expertise in computer graphics or visualization, but all areas of computer science will be considered. Our Applied Computing Laboratories include Open Source, Internet Teaching, and a Virtual Environments Lab. Students in these labs have been winners in a number of prestigious computing contests. There are good opportunities for collaboration with other centers and programs.

Responsibilities include teaching undergraduate and graduate level courses, and directing graduate students. Minimum requirements are a Ph.D. in computer science by the date of appointment, demonstrated excellence in research and teaching, and fluency in English. Applications including vita and three reference letters should be submitted to:

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

Completed applications will be reviewed starting immediately. For full consideration, applications must be complete by February 29. Women and minorities are urged to apply.

Clarkson University is an AA/EOE Employer. (Pos. # 81-07)

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. Duties include teaching computer science courses, conducting research, 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 undergraduate teaching and an active research agenda required. Well qualified candidates from all areas of computer science will be considered. Salary is commensurate with rank, qualifications, salary history and experience.

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

EEO/AA/ADA/IRCA

CWI, Centrum Wiskunde & Informatica Probability, Networks and Algorithms Department

Tenure-Track in Algorithmic Game Theory & Postdoc in Mechanism Design

CWI, Amsterdam, The Netherlands, invites applications for a tenure-track position in Algorithmic Game Theory and for a postdoc position in Mechanism Design within the group PNA1 'Algorithms, Combinatorics and 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 (CTI) at DePaul University invites applicants for a full-time, tenure-track position in one of the most comprehensive and fastest-growing 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 300 majors enrolled in the BS and MS degree programs. DePaul University is a NSA/DHS Center of Academic Excellence in Information Assurance Education.

Candidates for the position will have a strong interest and experience in information assurance. We encourage candidates with specializations in all areas of information assurance to apply. We are particularly interested in those with specializations in audit compliance, risk management and information security management. Any terminal degree will be considered with an appropriate focus on information assurance.

For more information, please go to: <http://www.cti.depaul.edu/news/jobs.asp>

Eidgenössische Technische Hochschule Zürich 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 bridges the gap between software systems and hardware systems. Applications are solicited from candidates with internationally 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. program. 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, Multiprocessor/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 the:

President of ETH Zurich
Prof. Dr. R. Eichler, Raemistrasse
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).

With a view toward increasing the number of female professors, ETH Zurich specifically encourages qualified female candidates to apply.

FX Palo Alto Laboratory, Inc. (FXPAL)

Research Scientist Positions

FX Palo Alto Laboratory, Inc. (FXPAL) provides multimedia and collaboration technology research for Fuji Xerox Co., Ltd., a joint venture between Xerox 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 VR-related 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 applications that run on everything from cell phones and PDA's to laptop and desktop computers to very large clusters of multicore computers. Experience with parallel programming, large-scale storage systems and multimedia databases, distributed programming tools, and network protocols desired. Job code CRN/2
3. Document Image Analysis. Our goal in this project is to be able to understand 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 probabilistic model-driven 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 setting. All positions require a Ph.D. in Computer Science or related field, strong development skills and excellent publication 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 within the department. It is expected that within a short time of coming to Georgetown, this new faculty member will assume the duties and responsibilities of department chair. With the inception of the department's first graduate degree program in 2007, the department chair will be instrumental in continuing the ambitious vision 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 a scholar, experience as a successful teacher, and demonstrated leadership ability. Subject to review by the University Committee on Rank and Tenure, this position will be a tenured appointment at the full Professor level.

The department consists of 7 full-time faculty members, 5 adjunct faculty members, and a full-time administrative 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 to apply. The current research interests of the faculty are in algorithms, artificial intelligence, databases/data mining, nonstandard computing, security, 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@cs.georgetown.edu

Please send cover letter, curriculum vitae, research/teaching statements, and the names of 5 references to:

Dr. M. Brian Blake
Department of Computer Science
Georgetown University
37th and O 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 environment that values and supports diversity, equity and inclusiveness across our campus community and encourage applications from qualified individuals who will help us achieve this mission.

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

The Center for Research on Computation and Society solicits applications for its Postdoctoral Fellows Program for the 2007-08 academic year. Fellows are given an annual stipend of \$55,000 for up to three years to engage in a program of original research, and provided with additional funds for travel and research support.

(continued)

Professional Opportunities

For the past several years, we have recruited outstanding fellows in the specific focus areas of Privacy and Security. This year, we are broadening our search to additional areas related to Computation and Society including (but not limited to):

- Health and Medical Computing Technology
- Human Computer Interaction
- Automated Decision Making
- Privacy and Security

For the coming year we are especially interested in candidates whose work has connection with the developing uses of computer systems in health care. Given the purview of the Center, we are looking for researchers with broad interdisciplinary interests, desire to work with both computer scientists and colleagues from other disciplines, and demonstrated interest in connecting their research agenda with societal issues. Fellows work with computer science faculty and others from across Harvard University on their own research.

Harvard University is an Affirmative Action/Equal Opportunity Employer. We are particularly interested in attracting women and under represented groups to participate in the CRCS Fellows Program.

Applicants should send a cover letter, CV, research statement, and copies of up to three research papers, and have up to three letters of reference sent to:

Postdoctoral Fellows Program
Center for Research on Computation and Society
Maxwell-Dworkin Laboratory – 247
Cambridge, MA 02138

The application deadline for full consideration is February 15, 2008. Candidates are urged to visit <http://www.crcs.deas.harvard.edu/> for further information.

Hendrix College Department Mathematics & Computer Science Visiting Assistant Professor Position

Hendrix College, a central Arkansas liberal arts college, announces a 2-year, full-time, 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 undergraduate levels, and directing undergraduate research. Applications will be reviewed upon receipt.

Full information at:
ozark.hendrix.edu

Iowa State University Department of Electrical and Computer Engineering Harpole Professorship

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

- Computer engineering with emphasis on embedded systems;
- VLSI with emphasis on analog/mixed-signal/RF IC design and bio applications;
- Software engineering;
- Information assurance and security; and
- Distributed decisions sciences, controls, and applications.

Duties for this position include undergraduate and graduate education, developing and sustaining externally-funded research, graduate student supervision and mentoring, and professional/institutional service.

The candidate for this position must be eligible for appointment at the tenured full professor rank. The candidate must also possess international recognition as an outstanding scholar and researcher, a strong performance as a teacher, a demonstrated ability to interact productively with the

industrial community and governmental agencies, a demonstrated ability to build and sustain a productive externally funded research program, and strong leadership skills. The candidate must have an earned Ph.D. degree in Electrical Engineering, Computer Engineering, Computer Science or a related field.

Screening applications will begin immediately, and will continue until the position is filled. To ensure consideration, submit application by April 1, 2008.

Apply online at:
www.iastatejobs.com
Vacancy #070769
ISU is an EO/AA employer.

Johns Hopkins University Human Language Technology Center of Excellence Research Staff/Post-Docs/Graduate Fellows

The Human Language Technology Center of Excellence is looking for world-class Ph.D. researchers, post-docs, and graduate fellows to work on long-term challenge problems in robust speech processing and knowledge extraction from natural language for its Department of Defense sponsor. The Human Language Technology Center of Excellence was initiated in January 2007 and has a long-term research contract as an independent center within Johns Hopkins University. Distinguished contract partners include the University of Maryland College Park, Johns Hopkins University Applied Physics Lab, and BBN Technologies of Cambridge, Massachusetts. World-class researchers are invited to be involved in this new center focused on fundamental challenge problems of high importance to the nation's security.

Core research areas of the center include technologies for robust speech processing across a wide range of dimensions, including language, channel, and formal vs. informal and technologies for creating knowledge bases from the products of natural language, including text. New research areas are explored in workshops engaging the best and the brightest from across the US. Those areas for which new challenge research topics are identified may result in proof-of-concept research projects to be carried on by the center, successful completion of which may lead to new core research topics that may carry on for several years afterwards.

Substantial computing capability is being installed to enable research that requires heavy computation and massive storage. Researchers are encouraged to publish freely in peer-reviewed venues. Engagement with the center is available in a variety of forms, including, but not limited to, full-time regular research staff, professors on sabbaticals, visiting scientists, post-docs, and especially graduate fellows. All are encouraged to work at the center which is conveniently located within a short walk of the Homewood Campus of the Johns Hopkins University in Baltimore Maryland.

U.S. Citizenship is required. In addition a DoD TS/SCI clearance is required and the center sponsor will seek clearances for those who do not already have one. The Johns Hopkins University is an equal opportunity employer and has a smoke-free environment.

Please send responses or inquiries to:
Gary W. Strong
Executive Director
Human Language Technology Center of Excellence
810 Wyman Park Drive
Baltimore, MD 21211
gstrong@jhu.edu

Louisiana State University in Shreveport Department of Computer Science Department Chair and Endowed Chair for Bioinformatics

LSUS invites applications for 2 tenure track positions-Chair of the Computer Science Dept. and the Abe Sadoff

Endowed Chair for Bioinformatics-starting August 2008.

Additional information about these positions can be found at:
www.lsus.edu/jobs
LSUS is an EOE/AA employer.

MIT and Harvard The Broad Institute Computational Biologist Position

Apply your computing skills to DNA at MIT.

Have stellar computational skills, PhD or equivalent experience? Enjoy solving nearly impossible problems? We'll retrain you to work with cutting-edge DNA technology.

We find biomedical applications for new DNA sequencing instruments yielding billions of short DNA sequences like: AATGTAATTTCAAATGTTAGCTCAT TTTTGTTAATG

We need you on our team to solve the hard mathematical and computational challenges using terabytes of these data. We invent algorithms, delve deeply in the data, code like crazy, help design laboratory experiments: we do whatever is needed to make the new technologies fulfill their promise to unlock the mysteries of genomics and biomedical research in critical areas like cancer, human genetics, infectious disease, antibiotic discovery, genome evolution, man's inhumanity to man, and the number 42.

We seek candidates from highly diverse backgrounds, industrial and academic. Mathematical and computational experience and excellence required, including superb C++ skills in a Linux or Unix environment. Biology training helpful but not required as you can learn on the job. Outstanding oral and written communication skills, joy in teamwork. A group leader position is also open for a candidate with proven leadership experience in computational science.

The Broad Institute of MIT and Harvard has an intense, exciting environment, world-class laboratory and computing facilities, hundreds of scientists tackling a wide range of critical problems in biology and medicine. Come join us.

Apply now at <http://hrweb.mit.edu/staffing/>, search for mit-00003916 and mit-00004577, Computational Biologist and Group Leader positions.

We are an equal opportunity, affirmative action employer.

MIT and Harvard The Broad Institute Computer Scientist Position

Apply your computing skills to DNA at MIT.

Have stellar computational skills, PhD or equivalent experience? Enjoy solving nearly impossible problems? We'll retrain you to work with cutting-edge DNA technology.

We find biomedical applications for new DNA sequencing instruments yielding billions of short DNA sequences like: AATGTAATTTCAAATGTTAGCTCAT TTTTGTTAATG

We need you on our team to solve the hard mathematical and computational challenges using terabytes of these data. We invent algorithms, delve deeply in the data, code like crazy, help design laboratory experiments: we do whatever is needed to make the new technologies fulfill their promise to unlock the mysteries of genomics and biomedical research in critical areas like cancer, human genetics, infectious disease, antibiotic discovery, genome evolution, man's inhumanity to man, and the number 42.

We seek candidates from highly diverse backgrounds, industrial and academic. Mathematical and computational experience and excellence required, including superb C++ skills in a Linux or Unix

(continued)



RYERSON UNIVERSITY

FACULTY OF
**Engineering,
Architecture
& Science**

WELCOME

new ways of thinking
about our world.

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 a comprehensive university environment? Do you see yourself working as part of a highly collaborative, innovative faculty team with new ways of thinking about our world? Then, Ryerson's Faculty of Engineering, Architecture and Science is where you want to be.

DEPARTMENT OF
COMPUTER SCIENCE

Tenure-Track & Limited-Term Faculty Positions

The Department of Computer Science invites applications from outstanding candidates for two tenure-track positions and a three-year limited-term faculty position in Computer Science, beginning July 1, 2008, subject to budgetary approval. Candidates must have a PhD in Computer Science or closely related fields. We are especially interested in candidates with expertise in artificial intelligence, software engineering, computer human/robot interaction and information security. The successful applicants are expected to have demonstrated excellence in teaching and research, with the ability to establish or maintain a dynamic research program. For full details, including application instructions, please visit www.ryerson.ca/jobs. E-mail: recruit.cs@ryerson.ca

Ryerson University, located in downtown Toronto, is known for innovative programs built on the integration of theoretical and practically oriented learning. More than 95 undergraduate and graduate programs are distinguished by a professionally focused curriculum and strong emphasis on excellence in teaching, research and creative activities. Ryerson is also a leader in adult learning, with the largest university-based continuing education school in Canada.

Ryerson University has an employment equity program and encourages applications from all qualified individuals, including Aboriginal peoples, persons with disabilities, members of visible minorities and women. Members of designated groups are encouraged to self-identify. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority.

feas.ryerson.ca

ENGINEERING
|
ARCHITECTURE
|
SCIENCE

Professional Opportunities

environment. Biology training helpful but not required as you can learn on the job. Outstanding oral and written communication skills, joy in teamwork. A group leader position is also open for a candidate with proven leadership experience in computational science.

The Broad Institute of MIT and Harvard has an intense, exciting environment, world-class laboratory and computing facilities, hundreds of scientists tackling a wide range of critical problems in biology and medicine. Come join us.

Apply now at <http://hrweb.mit.edu/staffing/>, search for mit-00003916 and mit-00004577, Computational Biologist and Group Leader positions.

We are an equal opportunity, affirmative action employer.

MIT and Harvard The Broad Institute Software Engineer Position

Apply your computing skills to DNA at MIT.

Have stellar computational skills, PhD or equivalent experience? Enjoy solving nearly impossible problems? We'll retrain you to work with cutting-edge DNA technology.

We find biomedical applications for new DNA sequencing instruments yielding billions of short DNA sequences like: AATGTAATTTCAAATGTTAGCTCAT TTTGTTAATG

We need you on our team to solve the hard mathematical and computational challenges using terabytes of these data. We invent algorithms, delve deeply in the data, code like crazy, help design laboratory experiments: we do whatever is needed to make the new technologies fulfill their promise to unlock the mysteries of genomics and biomedical research in critical areas like cancer, human genetics, infectious disease, antibiotic discovery, genome evolution, man's inhumanity to man, and the number 42.

We seek candidates from highly diverse backgrounds, industrial and academic. Mathematical and computational experience and excellence required, including superb C++ skills in a Linux or Unix environment. Biology training helpful but not required as you can learn on the job. Outstanding oral and written communication skills, joy in teamwork. A group leader position is also open for a candidate with proven leadership experience in computational science.

The Broad Institute of MIT and Harvard has an intense, exciting environment, world-class laboratory and computing facilities, hundreds of scientists tackling a wide range of critical problems in biology and medicine. Come join us.

Apply now at <http://hrweb.mit.edu/staffing/>, search for mit-00003916 and mit-00004577, Computational Biologist and Group Leader positions.

We are an equal opportunity, affirmative action employer.

Mount Holyoke College Computer Science Department Visiting Assistant Professor Position

Mount Holyoke College has a one-year position for a full-time, visiting assistant professor in any area of specialization. We are seeking someone with a strong interest in teaching and working closely with undergraduate students. Ph.D. must be completed by September 2008. Teaching experience is required. The teaching load will comprise two courses per semester.

Mount Holyoke is an undergraduate liberal arts college for women with approximately 2,000 students and 200 faculty. The College is an Affirmative Action, Equal Opportunity Employer. Review of applications will continue until the position is filled.

Candidates should submit CV, research description, and teaching statement online at:

<http://jobsearch.mtholyoke.edu>

Arrange for three letters of reference to

be sent directly to:

human-resources@mtholyoke.edu or
Mount Holyoke College
50 College Street
1 Skinner Hall
South Hadley, MA 01075
Attention: Computer Science Visitor Search

At least one recommendation letter should address teaching experience.

Northwestern University & The University of New Mexico Computer Science and Computer Engineering Postdoctoral Positions in Systems

The V3VEE project, a collaboration of Northwestern University and the University of New Mexico, solicits applications for postdoctoral positions. V3VEE is building a new open source virtual machine monitor for modern architectures that is intended to be useful for research in computer systems, computer architecture, and high performance computing, as well as in teaching. We are looking for researchers with demonstrated ability to do effective kernel development, to work both individually and in small teams, and who have the desire to work on an open-source project and interact with the broader open-source community.

For more information about this position, see <http://v3vee.org>.

To apply, please send a CV, up to two sample papers, and the names and contact information for two or three references to: recruiting@presciencelab.org

Oklahoma State University, Stillwater Computer Science Department Faculty Position

The Computer Science Department seeks applications for a non-tenure track, one-year, renewable Visiting Assistant Professor position commencing August 2008. Applications from candidates working in all areas of computer science are invited.

Candidates must hold a PhD in computer science or a closely related discipline. Applications received by March 30, 2008, are assured full consideration. Applications should contain a CV together with a statement on teaching experience. Please have three letters of recommendation sent directly to us (PDF email preferred).

Apply by email to: faculty-search@cs.okstate.edu

Or by U.S. mail to:
Faculty Search Committee
Computer Science Department, 219
MSCS
Oklahoma State University
Stillwater, OK 74078

The Department offers BS, MS, and PhD degrees in Computer Science. OSU is an affirmative action/equal opportunity employer. The Department and the College of Arts and Sciences are strongly committed to diversity and to providing a supportive environment for women and minorities. Oklahoma State University is an AA/EEO/E-Verify employer.

Old Dominion University College of Sciences Department Chair & Faculty Positions

The College of Sciences at Old Dominion University is undergoing a major expansion to increase research activities of faculty and to support the recruiting of outstanding graduate and undergraduate students. The Department of Computer Science seeks candidates for several positions:

Department Chair. A state salary line and a very well funded endowment support the salary and research activities of this position.

Multiple tenure track/tenured positions at senior and junior levels.

Candidates for chair should possess outstanding research and teaching credentials, strong leadership skills, a compelling vision for the future of computing, and the ability to enhance a quality computer

Postdoctoral Associate

Stony Brook University's Department of Computer Science seeks a Postdoctoral Associate. The Lydia project builds a relational model of people, places, and other entities 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://www.textmap.org/> to see our analysis of recent news and blog postings obtained from more than 500 daily online news sources. A two-year postdoctoral position is now available to join our team. **Required:** 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) graph algorithms and the science of networks, or (4) data analysis or visualization. The applicant will be expected to use his/her expertise to improve the quality of our analysis, and help manage a team of roughly ten graduate students as we shift beyond technological issues to questions of what this data means and how best to exploit it. As per sponsor requirements, applicants must be U.S. citizens who hold or will soon hold a Ph.D. in computer science, linguistics, economics, or any related field. Applications will be accepted until the position is filled.

For more information and to apply online visit www.stonybrook.edu/jobs or send your vita and contact information to: Steven Skiena
Department of Computer Science, Stony Brook University, SUNY, Stony Brook, NY 11794-4400
Equal Opportunity/Affirmative Action Employer.



science program. We invite both self-nominations and nominations from others. All nominations and applications will be kept strictly confidential. Nomination letters should identify the potential candidate and provide contact information. An application should include a curriculum vitae, a statement of research accomplishments and future research plans, a statement describing the candidate's vision for the future of computing at a major research university, a statement of teaching philosophy, and contact information for four references.

Candidates for full or associate professor must show evidence of strong research programs as evidenced by publications and peer-reviewed funding and demonstrate a strong teaching record. Candidates at the assistant professor level must demonstrate the ability to build strong research programs and perform quality teaching. The department offers competitive salaries and substantial start-up packages. The Department of Computer Science is well supported by peer-reviewed grants from NSF, NASA, DOE and other funding agencies. Areas of interest are broad and include digital libraries, digital media, medical imaging and applications, modeling and simulation, computational science, bioinformatics, security, sensor networks, wireless communication, data mining and visualization, and information retrieval, but all strong applications will be considered.

Interested candidates should submit a curriculum vitae, a statement of research activities and future research plans, contact information for four references and a statement of teaching philosophy. Applicants should specify the position and level for which they are applying. Electronic applications are preferred and should be sent to searchcommittee@cs.odu.edu. Paper applications can be sent to:

Search Committee
Department of Computer Science
Old Dominion University
Norfolk, VA 23529-0162

Applicants from dual-career couples are welcome. Review of applicants will begin immediately and continue until the positions are filled.

Old Dominion University is an affirmative action, equal opportunity institution and requires compliance with the Immigration Reform and Control Act of 1986.

Purdue University Department of Statistics Tenure-Track Faculty Positions

The Department of Statistics at Purdue University invites applications in all areas of the statistical and learning sciences for tenure-track positions beginning August 2008. Multiple positions are available at the Assistant Professor level; senior positions will be considered for highly qualified applicants. Additional positions are also available for candidates in applications

areas designated in COALESCE II, a College of Science-wide multidisciplinary hiring effort.

The Department has more than thirty tenured and tenure-track faculty members who direct a broad range of research programs in statistical learning, models, theory, probability, and computing. The Department is heavily involved in many application areas, and has expertise in models, methods, learning algorithms, and computational environments for massive data sets.

Further information about the department is available at:

<http://www.stat.purdue.edu>

All applicants should hold a PhD in Statistics, Computer Science, or related fields. An applicant should be committed to excellence in teaching, and have demonstrated strong potential for excellence in research.

Applicants matching one search may be considered in other relevant searches when appropriate. Review of applications will continue until the positions are filled.

For all positions in Statistics, please visit <http://www.stat.purdue.edu/hiring/> to apply.

Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer fully committed to achieving a diverse workforce.

University at Albany, SUNY College of Computing and Information Six Faculty Positions for Fall 2008 – P08-13272

The College of Computing and Information (CCI) of the University at Albany, SUNY, invites nominations and applications for up to six new tenure-track faculty positions in its three constituent departments: Computer Science, Informatics, and Information Studies. We seek a mix of computer scientists, information scientists, social scientists, and researchers in libraries, government, education, and other applicable environments. Candidates will be considered for appointments at all levels and senior positions may have appointments in multiple departments.

Applicants should have a Ph.D. or should have completed his/her Ph.D. by the starting date of appointment. The degree(s) must be from a college or university accredited by a U.S. Department of Education or internationally recognized accrediting organization. Applicants must have strong research credentials. We especially welcome candidates who would work across disciplines and provide linkages between departments. All applicants, regardless of discipline, should have an explicit focus on the construction of effective computing and information systems and/or the use of information in diverse settings. Applicants must include in their application their ability to work with and instruct culturally diverse groups of people.

(continued)

Professional Opportunities

Faculty will participate in all levels of the College's instructional programs, from undergraduate through doctoral education. Priority will be given to applicants with a strong interest in helping develop these programs and the interplay between them.

Details concerning the college's research portfolio and the search for new faculty members are available at:

<http://www.albany.edu/ci/portfolio.shtml>

Competitive salary and startup package, commensurate with experience. For a complete job description, please visit:

<http://albany.interviewexchange.com/jobofferdetails.jsp?JOBID=8311>

For information about the College, please visit our website at:

<http://www.albany.edu/ci>

Apply 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/IRCA/ADA employer.

University of British Columbia Department of Computer 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 aimed at outstanding researchers who are world leaders or who have the potential for world leadership in their fields. It is expected that the candidate 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 Secretariat. The successful nominee 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 exceptional track record, or potential for excellence, in research and teaching. The department is interested in candidates with a research focus in one of the following areas:

- (a) systems and network security; and
- (b) theory

Applicants for the position must submit a CV, a teaching statement, a research statement, and the names of at least three references. The teaching statement should include a record of teaching interests and experience. Applicants are strongly encouraged to complete their applications online by following the instructions at <http://www.cs.ubc.ca/career/faculty.shtml>. Alternatively, an applicant may send the above materials along with a cover letter stating his or her current title and affiliation, email address and postal address, and primary areas of research to:

Laks V.S. Lakshmanan (recruit@cs.ubc.ca)

Chair, Recruiting Committee
Department of Computer Science
University of British Columbia
Vancouver, BC, V6T 1Z4.

Applications will be accepted until March 15, 2008.

The position is subject to funding. UBC hires on the basis of merit and is committed to employment equity. We encourage all qualified persons to apply. Canada Research Chairs are open to individuals of any nationality. Offers will be made in accordance with Canadian immigration requirements associated with the Canada Research Chairs program.

University of Connecticut School of Engineering 10 Tenure-Track Faculty Positions

The School of Engineering at the University of Connecticut invites applications and/or nominations for 10 tenure-track faculty positions that will form the core of an interdisciplinary, integrated team working in the strategic areas of fuel cells or other alternative energy technologies and applications. The team will comprise qualified faculty at all ranks: Assistant, Associate Professor and Full Professor. Qualified candidates may be considered for tenured positions.

This sustainable energy team will conduct visionary research, education and outreach related to a new Eminent Faculty Initiative in Sustainable Energy established in 2007 at the University of Connecticut (UConn). The initiative is sustained by a permanent allocation of more than \$2 million annually from the State of Connecticut supplemented by additional support from private industry. The Eminent Faculty Initiative will be led by a senior, internationally recognized researcher.

Broad areas of technical expertise include, but are not limited to: alternative energy sources, energy conversion and storage, integrated system design and implementation, along with the corresponding enabling technologies. Applicants must have a Ph.D. in engineering or a related physical science discipline, as well as a demonstrated record of research in alternative and sustainable energies and supporting technologies, including fuel cells. It is expected this scholarly record will be outstanding and commensurate with rank.

Applications, including curriculum vitae along with the names and contact information of at least five references, should be sent to:

Chair, Eminent Faculty Initiative
Search Committee
Office of the Dean
School of Engineering
261 Glenbrook Road, Unit 2237
Storrs, CT 06269-2237

Electronic submission in .pdf format is encouraged. All communications are to be sent to:

efsc@engr.uconn.edu

Review of applications will begin immediately, and will continue until the positions are filled. (Search #2008260)

The University of Connecticut is an Equal Opportunity, Affirmative Action employer.

University of Denver Computer Science Department Faculty Position

We invite applications for a tenure-track faculty position at the Assistant Professor level to begin Fall 2008. Exceptional candidates at other ranks will be considered as well. The minimum requirements are a PhD in CS or a related area by the time the appointment begins and demonstrated ability in research and teaching. The department is particularly interested in a candidate who can teach and direct research in the following areas: entertainment computing; interactive simulations and games; trustworthy computing (networks, security, privacy, fault tolerance); and systems and software engineering. The successful candidate is expected to participate fully in the department through an active research program, excellent teaching, and dedicated service.

The Computer Science Department is part of the School of Engineering and Computer Science (SECS) at the University of Denver. SECS promotes research and teaching collaborations among different disciplines. Faculty in Computer Science have unique opportunities for cross-disciplinary collaboration. For further information, visit the SECS website at:

<http://www.du.edu/secs/>

Our current faculty's research interests include algorithms, computer security, database systems, distributed systems and

algorithms, graphics, networking and games, performance modeling, programming languages, and software engineering. We offer bachelor's, master's and doctoral degrees.

The University of Denver is a medium-size (11,000 students) private university. Class sizes are small, the teaching load is moderate and the salary is competitive. The university is located in an attractive residential area 5 miles from downtown Denver. Denver, with its metro area population of 2.3 million, is consistently ranked as one of the country's top five most pleasant places to live. Many of the country's best ski areas, mountain bike trails, and the 14,000 foot peaks of the Colorado Rockies are only one or two hours away.

The University of Denver is committed to enhancing the diversity of its faculty and staff and encourages applicants particularly from women, minorities and the disabled.

Application screening will begin immediately and continue until the position is filled. Applicants should submit a curriculum vitae, a statement of teaching and research interests and have at least 3 reference letters sent to www.dujobs.org.

The University of Denver is an AA/EOE.

Applicants should apply online at www.dujobs.org and provide:

- (1) position applying for;
- (2) curriculum vitae;
- (3) three references with contact information;
- (4) statement of research vision; and
- (5) statement of teaching interests.

These positions will stay open until filled. Review of applications will begin immediately.

University of Georgia Franklin College of Arts and Sciences Tenure-Track Positions in Bioimaging

The Franklin College of Arts and Sciences at the University of Georgia invites applications for two (2) tenure track positions at the Assistant or Associate Professor level to begin August, 2008 in our fast-growing bioimaging research core. Faculty are being recruited across disciplines integral to the development of a University-wide initiative in bio-imaging research dedicated to addressing today's biomedical health problems. Examples of appropriate disciplines include, but are not limited to, Anthropology, the Biological Sciences, Computer Science, Linguistics, Mathematics, Neuroscience, Physics, Psychology, and Statistics. Faculty are expected to use as their primary research tools those technologies currently in the state-of-the-art Bio-Imaging Research Center (BIRC), one of the few research-dedicated centers of its kind in the nation, including high-field magnetic resonance imaging (MRI, fMRI, DTI, MRA, MRS, and MNS capabilities), magnetoencephalography (MEG), and/or dense-array electroencephalography (EEG).

These technologies allow for exquisite structural and functional imaging of the brain and central nervous system, as well as muscle, and bone. We seek outstanding scholars engaged in high impact research, regardless of specific research focus. Successful candidates are expected to develop nationally recognized research lines and successfully compete for extramural funding. Successful candidates will be housed in and be considered for promotion and tenure within their primary department, with appointments to the BIRC. The Bio-Imaging Research Center, or BIRC <http://www.uga.edu/psychology/BIRC/facilities/index.htm> is housed in the newly constructed Paul D. Coverdell Biomedical Health Sciences Building. It is a 9,000 square foot research suite dedicated to bio-imaging research for the good of the State of Georgia and the nation. The combination of technologies in the BIRC represents an indispensable set of integrated tools for biomedical research and an exceptional opportunity for academic researchers. Together they enable exquisite

high-spatial resolution tissue imaging in humans and animals via magnetic resonance imaging (MRI), and integrate with high temporal resolution data of brain activity (MEG, EEG). Potential for collaborations are available across the University and may include the Biomedical Health Sciences Institute and its new Neuroscience Degree program; the Regenerative Bioscience Center; Nanotechnology; Bioengineering; Developmental Biology; the Institute of Behavioral Research; the Institute of Gerontology; inter-departmental collaborations and inter-institutional collaborations with the Medical College of Georgia, Emory, the Shepherd Center and Georgia Tech.

Candidates should send a letter of application describing research and teaching interests, a curriculum vita, and reprints/preprints, and arrange to have four letters of reference sent to:

Chair, Bioimaging Search Committee
care of L. Stephen Miller, Ph.D.
Bioimaging Research Center
Paul D. Coverdell Bldg, Room 119
500 D.W. Brooks Drive
University of Georgia
Athens, GA, 30602

The Franklin College of Arts and Sciences, its many units, and the University of Georgia are committed to increasing the diversity of its faculty and students, and sustaining a work and learning environment that is inclusive.

The University is an EEO/AA institution.

Applications received by January 25, 2008, are assured full consideration.

University of Southern California Computer Science Department The Teamcore Research Group Post-Doctoral Research Associate Position

The Teamcore group (teamcore.usc.edu) is focused on research on multiagent systems where multiple agents (including software agents, robots and people) may interact. We focus on fundamental research issues in Belief-Desire-Intentions (BDI) systems, in Distributed Constraint Reasoning (DCR), and in Decision Theoretic (distributed MDPs) and Game Theoretic approaches for multiagent systems. In addition to fundamental research, the group is also focused on practical implementations of their research.

The most recent practical implementation is the ARMOR system deployed at the Los Angeles International Airport:

<http://www.newsweek.com/id/43401>

We have an opening for a post-doctoral research associate position starting in Spring 2008. Research will focus on the areas of fundamental research outlined above, with emphasis on new algorithms and but also on their practical implementations/applications. Interested applicants should send their CV and have three letters of recommendation forwarded to Professor Milind Tambe (tambe@usc.edu).

The University of Texas at Arlington Computer Science and Engineering Two Tenure-Track Faculty Positions

The University of Texas at Arlington (UTA), Computer Science and Engineering (CSE) Department has two tenure track faculty positions to fill for the year 2008-2009. We invite applications in computer engineering and software engineering and in all applied areas of computer science including, computer graphics, animation, game development, embedded systems (sensors and devices), speech and audio, augmented reality, and entertainment computing. Applications are for all ranks. Major department strengths include databases, networks, mobile and pervasive computing, computer vision, bioinformatics and biomedical computing, artificial intelligence applications and intelligent systems.

Applicants must have an earned doctorate in computer science or computer engineering and have demonstrated a commitment to quality teaching and scholarly

Professional Opportunities

research. Interested persons should submit a letter of application, a resume, best papers, and reference letters online (hardcopy or email applications are not accepted) at:

<http://www.cse.uta.edu/recruiting/>

For further information concerning the search, please contact Professor Dave Kung, Search Committee Chair (Phone: 817-272-3605; search@cse.uta.edu).

The departmental website is at <http://www.cse.uta.edu>.

This is a security sensitive position, and a criminal background check will be conducted on finalists.

UTA is an Equal Opportunity/Affirmative Action Employer.

University of Tulsa Department of Computer Science Endowed Chair in Neuroinformatics - Junior Rank

The University of Tulsa (TU) has established an Endowed Chair in Neuroinformatics, and invites applications for a tenure-track appointment in the Department of Computer Science at the rank of assistant or associate professor with a joint appointment in the Department of Biological Sciences.

Representative research areas for the qualified candidate include, but are not limited to, modeling and simulation of large scale neural systems and circuits relevant to human brain function and disease, computational approaches to understanding neuronal behavior, genetic mechanisms of disease, image processing and pattern recognition, and novel approaches towards correlative analysis of genomic and imagery data.

The faculty member will conduct research and provide leadership for scholarly initiatives in the Institute of Bioinformatics and Computational Biology (IBCB) at TU. IBCB's mission is to advance the fields of bioinformatics and computational biology and to prepare students for careers in biotechnology research and 21st century medicine.

The faculty member also will collaborate with researchers and clinicians in the Neuroimaging Center at the Laureate Psychiatric Clinic and Hospital in Tulsa, Oklahoma. The Center brings together physicians, scientists and faculty from University of Oklahoma Health and Medical Sciences Center, the Oklahoma Medical Research Foundation, and The University of Tulsa, all working to better understand the genetic and neuroscience basis of human brain function.

Candidates must have a Ph.D. or equivalent degree and a record of research in systems neuroscience, computational neuroscience, neuroinformatics to include genomic relationships, 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 a ballet theatre, 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, 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, Neuroinformatics Search Committee Chair
Department of Computer Science
The University of Tulsa
800 Tucker Drive
Tulsa, Oklahoma 74104
john-hale@utulsa.edu

Review of applications will begin 1 December 2007 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).

Our new colleague will join a broad-based Information School with bachelors, masters and doctoral academic programs. This is a full-time appointment anticipated at the rank of Assistant or Associate Professor commensurate with qualifications and experience. 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 minority candidates. The University of Washington is an Equal Opportunity/Affirmative Action employer, and is one of the oldest state-supported institutions of higher education on the Pacific coast.

Applicants can find further information about the Information School at:

<http://www.ischool.washington.edu>

For full position announcements and application instructions please visit us at:

<http://www.ischool.washington.edu/people/fac-openings.aspx>

Vassar College Department of Computer Science Visiting Assistant Professor Position

Vassar College seeks applications for a Visiting Assistant Professor for the 2008-2009 academic year. A commitment to excellence in undergraduate teaching and research is expected. The Ph.D. in computer science is required. Applicants with a background in any area of Computer Science will be considered. Interest and expertise in modeling and simulation, computational science, or databases is a plus. All candidates must be able to cover courses in the core areas of Computer Science.

Vassar College is an equal opportunity/affirmative action employer and is actively committed to diversity within its community. Applications from members of historically under-represented groups are especially encouraged to apply.

Vassar College has been successfully building a strong undergraduate program in Computer Science. Introductory courses are taught using Java and C++. The department has two Linux laboratories for introductory and advanced instruction. Faculty are provided with Unix workstations and personal computers.

For more information see the CS Dept web site. Review of applications will begin January 1, 2008 and continue until the position is filled. Send vita and three letters of reference to:

Nancy Ide, Chair,
Department of Computer Science
Box 732
Vassar College
Poughkeepsie, New York 12604-0732
E-mail: csdept@cs.vassar.edu

York University Department of Computer Science and Engineering Assistant/Associate Professor Position

York University has identified medical instrumentation as an area of strategic importance with a vision of developing a proposed National Centre for Medical Devices Development (NCMDD), a broad consortium of public- and private-sector companies. The NCMDD initiative is designed to

create new research and economic opportunities around an existing medical devices industry cluster existing in the York region. Therefore, the Department of Computer Science and Engineering in the Faculty of Science and Engineering, York University, Toronto, Ontario, Canada, invites applications for a professorial stream appointment at the Assistant or Associate Professor level, in the general area of biomedical engineering.

The successful candidate will have a Ph.D. in Engineering, Computer Science, or a closely related area, and a track record of excellence as a scholar including outstanding research in developing medical devices and instrumentation with a strong commitment to teaching at the undergraduate and graduate level. Exceptional candidates with research interests in related fields of biomedical engineering would also be considered. The successful candidate shall demonstrate commitment to the engineering profession by being licensed as a Professional Engineer, or by becoming licensed soon after appointment. The successful candidate will be expected to develop strong, externally funded research programs, and contribute to teaching Computer Science and Engineering courses at the undergraduate and graduate levels. The successful candidate should be eligible for appointment to the Faculty of Graduate Studies. This position is to commence from July 1, 2008 and is subject to budgetary approval.

York University is an Affirmative Action Employer. The Affirmative Action Program can be found on York's website at www.yorku.ca/acadjobs or a copy can be obtained by calling the affirmative action office at 416-736-5713. All qualified candidates are encouraged to apply; however, Canadian citizens and Permanent Residents will be given priority.

Applicants should forward a curriculum vitae, an outline of their research plans, single copies of three publications, and the names and contact details of three references, by April 30, 2008, to:

Chair, Search Committee
Department of Computer Science and Engineering
Room 1003, Computer Science and Engineering Building
York University
4700 Keele St.
Toronto, ON Canada M3J 1P3
For additional information on Research and Undergraduate/Graduate Programmes in Computer Science and Engineering Department at York University visit URL: <http://www.cse.yorku.ca> or contact: Clara Masaro, Administrative Assistant to the Chair
clara@cse.yorku.ca
Tel. 416.736.2100 Ext. 33977
Fax. 416.736.5937
Applicants should indicate their professional engineering status and affirmative action details.

Grace Hopper Celebration of Women in Computing

'WE BUILD A BETTER WORLD'

Keystone Resort,
Colorado
October 1-4, 2008

<http://www.gracehopper.org/>

Announcement: Undergraduate Research Opportunities

Application Deadline: May 2, 2008

The Committee on the Status of Women in Computing Research (CRA-W) and the Coalition to Diversify Computing (CDC) announce a call for proposals for programs supporting innovative research for undergraduates. The goal of the programs is to increase the numbers of women and the number of men from underrepresented groups entering graduate school in computer science and engineering.

The Collaborative Research Experience for Undergraduates (CREU) program supports undergraduate research in computer science/computer engineering for small teams (2 to 4 students) at their home institutions during the academic year 2008-09. Teams consisting of all women or all members of underrepresented groups are especially encouraged to apply. Students receive a \$3,000 stipend for their work in the year-long project. Each team can also request an extra \$500 to be used for supporting materials and activities. More information and the application process can be found at: <http://www.cra.org/craw/creu>.

The Multidisciplinary Research Opportunities for Women (MRO-W) program supports undergraduate research in multidisciplinary areas making effective use of cyberinfrastructure. The program supports teams of undergraduates who work during the academic year 2008-09 and summer 2009 at their home institutions. Each team must include scientists from the computing and non-computing fields, as well as women undergraduate students from the respective fields. Each student receives a stipend of \$3,000 for her work during the academic year and \$4,000 during the summer. Each project may also request up to \$1,500 to be used for supporting materials and activities.

More information and the application process can be found at:

<http://www.cra.org/Activities/craw/mrow/>.

For information and a comparison of undergraduate research programs funded by CRA-W and CDC, see:

<http://www.cra.org/Activities/craw/UgradResearch/>. ■

CRA CONFERENCE AT SNOWBIRD 2008 ♦ JULY 13–15, 2008 ♦ SNOWBIRD, UTAH

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.

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.

Preliminary Program

Sunday, July 13

CRA Board of Directors Meeting (begins Saturday 6PM) **8:30AM - 2:45PM**
Conference Registration 2:00PM - 7:30PM
Workshop for New Department Chairs 3:00PM - 5:30PM
Co-Chairs:
 Susanne Hambrusch (Purdue University)
 Darrell Whitley (Colorado State University)
Speakers:
 Jean Ferrante (UC San Diego)
 Diane Souvaine (Tufts University)
 Robert Walker (Kent State University)
 Xiaodong Zhang (Ohio State University)
Welcome Reception Dinner 6:00PM - 7:00PM
7:00PM - 9:00PM
Speaker:
 Shree Nayer, Ph.D.
 T.C. Chang Chaired Professor
 Department of Computer Science, Columbia University
"Computational Cameras: Redefining the Image"

Monday, July 14

Breakfast Buffet 7:00AM - 8:30AM
Registration 7:30AM - 6:00PM
Welcome 8:30AM - 8:40AM
Speakers:
 J Strother Moore, University of Texas at Austin (Academic Snowbird Chair)
 Marek Rusinkiewicz, Telcordia Technologies (Labs/Centers Snowbird Chair)
PLENARY SESSION I 8:40AM - 10:00AM
Innovation in the Knowledge Economy
Chair: Cita Furlani (NIST)
Speaker: Irving Wladawsky-Berger (MIT)
Break 10:00AM - 10:30AM
Workshop I (three parallel sessions) 10:30AM - Noon
New NRC Rankings and the Taulbee Report
Speakers:
 Stuart Zweben (Ohio State University)
 Charlotte Kuh (NRC Policy and Global Affairs Division)
Paper and Proposal Reviews: Is the Process Flawed?
Chair: Hank Korth (Lehigh University)
Panelists:
 Phil Bernstein (Microsoft)
 Le Gruenwald (National Science Foundation)
 Phokion Kolaitis (IBM)
 Kathryn McKinley (University of Texas at Austin)
 Tamer Oszu (Waterloo)
Web 2.0
Chair: Natalie Glance (Intelliseek Applied Research Center)
Speakers:
 Steve Skiena (New York University)
 Jure Leskovec (Carnegie Mellon University '08)
Luncheon Noon - 1:30PM
PLENARY SESSION II 1:30PM - 3:00PM
Industrial Hiring Expectations: The Big Picture
Chair: Alon Halevy (Google)
Speakers:
 Alan Eustace (Google)
 Eric Grimson (MIT)
Break 3:00PM - 3:30PM
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)
 Sethuraman (Panch) Panchanathan (Arizona State)
Speakers:
 Atul Butte (Stanford University)
 Jim Karkanas (Microsoft Research)
 Peter Szolovits (MIT)
Industry/Academic Partnerships
Chair: Gabby Silberman (CA Labs)
Speakers:
 Hausi A. Muller (University of Victoria, Canada)
 Helen Meng (The Chinese University of Hong Kong)
 Josep Lluís Larriba-Pey (Larri) (The Polytechnic University of Catalonia, Barcelona)

Innovative Undergraduate Curricula
Chair: Mark Guzdial (Georgia Tech)
Speakers:
 Merrick Furst (Georgia Tech)
 Deepak Kumar (Bryn Mawr)
 Lynn Stein (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 Bernat (CRA Executive Director)

Tuesday, July 15

Breakfast Buffet 7:00AM - 8:30AM
PLENARY SESSION III 8:30AM - 10:00AM
Computing Research Funding: The Federal Picture
Chair: Andrew Bernat (CRA)
Speaker: Jeannette Wing (NSF CISE)
Break 10:00AM - 10:30AM
Workshop III (four parallel sessions) 10:30AM - Noon
Communicating the Excitement of CS: K-12 Outreach Practices
Chair: Eric Grimson (MIT)
Speakers:
 Maureen Biggers (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)
Panelists:
 Randal Nelson (University of Rochester)
 Mor Harchol-Balter (Carnegie Mellon University)
 Jeff Klingner or Adam Beberg (Stanford University)
Research on a Small Scale
Chair and Speaker: Karen T. Sutherland (Augsburg College)
Speakers:
 Ishwar Sethi (Oakland University)
 Holly Yanco (UMass, Lowell)
Wikinomics & Researchnomics: Accelerating CS Research
Chair: David Tennenhouse (New Venture Partners, LLC)
Speakers: TBD
Luncheon Noon - 1:30PM
Hot Topics 1:30PM - 2:30PM
Chair: David Notkin (University of Washington)
 Wish you had asked a question at a session? Wish you had run a session? Wish you had planned Snowbird? Have something (at least) somewhat related to computing research on your mind? Don't like the alcohol rules in Utah? If so, the inaugural Hot Topics session is for you. Five-minute blocks (any projector setup is considered as charged time) are available, with comments and opinions that are six sigmas out preferred. Selection is entirely at the discretion of the session chair, who will entertain requests by email and on site.
PLENARY SESSION IV 2:30PM - 4:00PM
Computing Community Consortium
Chair and Speaker: Ed Lazowska (University of Washington)
Speakers:
 Susan Graham (UC Berkeley)
 Chip Elliott (BBN)
 Ellen Zegura (Georgia Tech)
Workshop for IT Deans 4:00PM - 9:00PM
Chair:
 Bobby Schnabel (Indiana University)

Wednesday, July 16

8:30AM - Noon
Program and Registration Information
<http://www.cra.org/snowbird>