COMPUTING RESEARCH NEWS

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The Critical Role of Science and Technology for National Defense

By the Honorable Zachary J. Lemnios, Director, Defense Research and Engineering, and Mr. Alan Shaffer, Principal Deputy, Defense Research and Engineering

We are embarking on a new era in Defense research. Over the past decade we have seen remarkable progress from the computer science research community spurring growth in the fields of robotics, learning and reasoning, language understanding, collective intelligence and other related technologies. These advances are beginning to find their way into new products and are redefining the human-machine interface.

At the same time, industry, academia and the federal government need to engage as a Research Triple to advance new technical ideas in response to an emerging set of national security challenges. This Research Triple is both a challenge and an opportunity for the Computer Science community and is critically important to the Department of Defense.

A New Landscape

The foundation of the defense science and technology (S&T) enterprise was anchored when Vannevar Bush outlined a strategy for using technology research and development as the underpinnings of our national security.[1] Since 1945, no country has invested more in basic research than the United States.[2] Over the past six decades, this strategy has led to training of generations of scientists, opened new technical fields, launched new business sectors, provided the underpinning of our economic prosperity, and provided critical national security capabilities.

Unlike Vannevar Bush's era, our current landscape includes a set of technologically savvy and well-resourced international peers. Research is seldom conducted in isolation and often includes international collaborations and global input. As a result, many countries and individuals now enjoy broad access to nearly all leading-edge technologies. While this model drives the innovation cycle of commercial products at a pace much faster than Moore's Law, it has profound implications for our national security challenges.[3]

While the Department of Defense continues to lead the technical agenda in defense-specific technologies, these have become fewer and been replaced by the application of commercial-based technologies. With few exceptions, the Department no longer can assume a preeminent position in driving many leading-edge technologies and no longer enjoys selective access to many of these same leading-edge technologies. That said, the Department continues to maintain superiority through superb system design and integration skills, manufacturing innovations and the unmatched skills of our operators.

The emergence of hybrid and irregular warfare is driving a set of new research directions for the Department of Defense and has placed a premium on rapid innovation and deployment of concepts to counter rapidly emerging threats. New research efforts in human terrain mapping, ubiquitous observation, contextual exploitation and decision support are beginning to demonstrate results and are being transitioned to use. Other capabilities outlined in a recent Defense Science Board Study[4] are needed to operate effectively in this space.

This environment has renewed the focus of our nation s Science, Technology, Engineering and Math foundations.[5] It is also the driver for the Department of Defense Science and Technology Strategy to operate over a new set of coordinates: Innovation, Speed and Agility.

DDR&E Imperatives

With this changing landscape and new technical challenges before us, there are considerable opportunities where computer science research could have a significant and lasting impact on our national security. These research thrusts can be discussed within the context of four imperatives we defined to address the challenges of providing technological solutions to our warfighters today and in the future. These are not lofty vision statements or broad goals and objectives. These are the four tasks that we have to get right and have to act on each and every day. The role of computer science research in achieving these goals is critical. These imperatives, outlined below, are the

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New Directions at DARPA

By Ed Lazowska and Dave Patterson

In July, Dr. Regina Dugan was sworn in as the 19th Director of the Defense Advanced Research Projects Agency. In September she visited six universities: Virginia Tech (her undergraduate alma mater), Texas A&M, UCLA, Caltech (her graduate alma mater), Stanford, and UC Berkeley. Here are some of the messages she delivered during these visits:

- DARPA recognizes that it must work hard to win back the attention of top researchers in important fields, including computer science.
- DARPA places a high value on fundamental research, framed within its agency mission.
- DARPA recognizes that breakthrough work is not usually characterized by improvements that are monotonic, step-by-step, inch-by-inch. Program managers will work with PI's to develop the most effective and sensible ways to assess progress. Go/no-go decisions on strict schedules will not be the norm.
- Program managers will be able to have far greater collaboration with their PI's because they are not in the role of "annual evaluator." PM's will be challenged to become active partners with PI's.
- DARPA is challenging itself, from this point forward, to eliminate, wherever possible, classification, pre-publication review, ITAR and foreign national restrictions, as well as other perceived or actual constraints on fundamental research, except in those unusual cases where it is necessary to protect national security or the safety of military personnel.
- There will be more realistic conflict-of-interest rules for individuals working at DARPA, making it easier for university researchers to spend time at the agency. There will be less adverse impact on the individual, and on his or her home institution.
- Additionally, DARPA will work in partnership with universities and the private sector to ease the transition back to university life after a tour at DARPA.
- There will be a renewed emphasis on *students*—on their ability to surprise us with outside-the-box thinking. (Landmark student achievements in computer science and other fields were highlighted in Dr. Dugan's presentations.)
- Each and every DARPA program need not have direct, immediate impact on the military. Some will, but others will need to be embraced by industry, or will need further research. Asking the military to try to apply programs in these latter categories is not helpful to these services or to the research community.
- There must be active dialogue between DARPA and universities to develop a sense of shared responsibility. DARPA depends on universities to encourage their best people to serve the nation by working on problems of critical importance, and by contributing to the program management function, which is critical to the quality of research sponsorship.

These messages signal a dramatic shift from the approach of Dr. Dugan's predecessor—a shift that is of enormous importance to our field and to the nation. Another important signal is the recruiting of our colleague Peter Lee from CMU to DARPA to direct

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Expanding the Pipeline

Empowering Leadership: An Expanding NSF Alliance Impacting Minority Scholars Nationwide

By Richard A. Tapia

The Broadening Participation in Computing (BPC) program within the CISE Directorate at the National Science Foundation (NSF), headed up by Program Director Jan Cuny, demonstrates NSF's serious commitment to increasing the participation of those who have long been underrepresented in computing. Numerous BPC Alliances and Demonstration Projects provide a wide range of services for many underrepresented groups. One such alliance, the Empowering Leadership: Computing Scholars of Tomorrow Alliance (EL Alliance, or ELA), has a goal of increasing participation of underrepresented minority students (URMs) who attend research one universities.

Developing the talent of minority students is critical to the country's future, and yet minority students at majority institutions are faced with multiple challenges to their success. They can be one of very few—or the only—minority in their classes, they may have come from a high school that lacked the resources to prepare them as well as their university colleagues, or they may lose confidence when faced with the high level of academic competition that they wouldn't have experienced in high school. Most significantly, their network of formal and informal resources, support, and encouragement, that is critical to all students, is significantly smaller and less robust. Talented, motivated minority students who do enter university intending to major in STEM fields often migrate away from computing to other disciplines or leave college altogether, due to a lack of support—what I like to call the loss of the precious few. The EL Alliance seeks to build a support network that can encourage and sustain students to retain them in their computing majors.

A Network of Support through Broadening Participation

Established in 2007, the EL Alliance offers a range of professional development, mentoring programs, conference participation, research opportunities, and support for URMs at research universities. Led by Rice University, the University of Illinois, Boston University, the University of Texas at Austin, and the University of California, Berkeley, the EL Alliance has created a supportive network composed of people from leading universities, professional societies, laboratories, research centers, and corporations, all committed to the success of minority scholars.

The number of professionals in the ELA community has grown tremendously in its first two years from the original 40 partners and leaders to 145, more than tripling the number of professionals engaged with the Alliance. These partners serve as mentors, guide research programs for students, meet with students at conferences, and participate in discussions that help shape the ELA's programs.

The EL Alliance student network more than doubled from 122 students at 30 universities at the end of our first year to 250 students at 74 universities in year two, and in the first quarter of 2009, doubled again to approximately 500 students from 175 universities. Females make up 44 percent of the ELA student network, much higher than the participation of females in computing in general. The EL Alliance Student Advisory Board, which includes undergraduate and graduate students from diverse disciplines, backgrounds, and institutions, provides input on their own experiences and advises the ELA leadership on programs of value to students.

Strategies to Support Students Nationwide

Based on input from students, faculty, administrators, and our independent evaluation team, the ELA has established three broad strategies for creating programs:

1. Building Infrastructure

Based on the original plans for the ELA, a national network of colleagues who share the common experience of being a minority student or faculty member at a research institution and others deeply committed to their success has been created. This network also includes our sister BPC programs, including the Alliance for the Advancement of African-American Researchers in Computing, Students and Technology in Academia, Research; Computing Alliance of Hispanic-Serving Institutions; Students and Technology in Academia, Research, and Service; AccessComputing; Commonwealth Alliance for Information Technology Education; National Center for Women in Technology; Computing Research Association Committee on the Status of Women in Computing Research; and the Coalition to Diversify Computing. Leveraging the unique resources among these programs allows all of us to focus on our strengths while offering more opportunities to a greater number of students.

2. Supporting Students

The needs of the students are at the core of the ELA's initiatives, which include professional development experiences, conference participation and networking, mentoring programs, and research opportunities. As students become members, they provide information to the ELA about themselves. The students' input on their perceived needs and interests—invaluable in guiding the ELA's programs—are as follows:

- Attend conferences in your discipline (88%)
- Meet leaders in your field from across the country (81%)
- Learn about resources available to assist with your research and career interests (74%)
- Participate in research programs (74%)
- Get to know other minority students in your field (69%)
- Intern at leading universities and laboratories (68%)
- Make presentations to your colleagues at conferences (46%)
- Provide insights to senior faculty and university administrators about how to improve their campus environments and programs (42%)

3. Adding to the National Knowledge Base

The ELA is studying and disseminating findings concerning the challenges and barriers for URMs at research institutions. Independent evaluation of the strategies employed in our programs help to determine how we are meeting our goals and to identify factors and practices of success. The dissemination of results and best practices will help inform the broader computing community and benefit minority students at research institutions.

EL Alliance's Models of Engagement

The ELA has developed and uses three models through which we work and engage others. The models are:

National Model

By building a national network of individuals across the country, we are able to engage individual students, faculty members, administrators, and computing professionals in virtual and in-person interactions, which is particularly important to isolated minority students. The model includes broad-reaching, yet individual, opportunities for engagement, national conferences, mentoring without borders, and partnerships with other national programs. Students participating in regional or local ELA programs also join the national network.

Conference participation, cited by our students as their highest priority of need, has played a significant role in building the ELA community and supporting students. National conferences such as SC'XY, the Richard Tapia Celebration of Diversity in Computing, and the Grace Hopper Celebration of Women in Computing have provided us the opportunity to bring together large numbers of ELA members

Expanding the Pipeline
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Message from the CISE AD
Computing and Administration Priorities

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

There is a new Administration in town and it talks science and it talks research.

"We'll restore science to its rightful place, and wield technology's wonders..." [President Obama, Inaugural Address, January 20, 2009].

"Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before. And if there was ever a day that reminded us of our shared stake in science and research, it's today." [President Obama, speech at the National Academy of Sciences (NAS), April 27, 2009].

And it talks evidence-based policy:

...to ensure that federal policies are based on the best and most unbiased scientific information [President Obama, NAS].

Just what are some of our new Administration's priorities in science, engineering, and technology research and education? And what implications do these priorities have for the computing community, for CISE, and for NSF?

Administration Priorities

Based on the August 4, 2009 memo to agency heads from Peter Orszag, Director of the Office of Management and Budget (OMB), and John Holdren, Director of the Office of Science and Technology Policy (OSTP), as well as numerous public talks given by OSTP staff, here is a summary of the Administration's priorities, grouped in terms of *scientific interests*, and *research modes* that cut across the scientific interests.

Scientific Interests:

- Science and technology for economic prosperity: jobs, new industries, innovation
- Energy, environment, sustainability
- Biomedical science and information technology for healthcare
- National security
- Education, especially in science, technology, engineering, and mathematics (STEM)

Research Modes:

- High-risk, high-return, transformative
- Multi-disciplinary
- Early investigator
- "Open innovation" model

What This Means for the Computing Community, CISE and NSF

For two of the scientific interests, economic prosperity and national security, what these priorities mean for us in the computing community is pretty obvious: Innovations in computing—hardware and software—have had an immeasurable impact on our economy, and moreover, an immeasurable impact on society. Many of those innovations came from investments in basic research and many came from our students on our campuses. Consider, for example, Huffman coding, public-key cryptography (Merkle), symbolic mathematics (Martin, Moses), BSD Unix, Mosaic, Google, and Akamai. We need to make sure that key stakeholders understand just how significant our contributions have been, and more importantly, just how much more we as a community have to offer for the good of the nation—we all need to continue hammering this point. National security now means not just securing our borders and protecting our troops, but also making cyberspace more trustworthy; cybersecurity is of tremendous interest to both this Administration and Congress. The case for increased and sustained investment in long-term, basic research in cybersecurity must continue to be made loudly and clearly,

Message from the CISE AD
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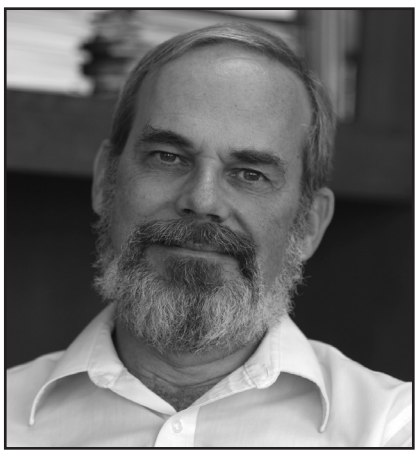
Musings from the Chair
Breaking the Image

By Eric Grimson, CRA Board Chair



For many institutions, early fall features Family Weekend events, when parents and families return to campus to visit their children and hear about research and educational activities occurring within the department. Especially for parents of first-year students, it is also an opportunity to hear about directions and opportunities in the field, as their children make decisions on a degree major.

Unfortunately, it has also evolved into an event at which departments must deal with dispelling myths and rumors. From parents, I regularly hear variations on questions like: *"Aren't all the jobs in computer science going overseas to India or China?"* (This one comes up perhaps less now than in previous years, but still recurs.) Or *"My daughter is really interested in providing better health care for everyone, and I have been telling her that computer science has nothing to contribute."* And from students, I regularly hear variations on questions like: *"I really like computing, but I don't want to end up stuck in a job like Dilbert™ or working with people like Dilbert™."* Or *"Don't you have to have been hacking since you were six if you want to major in computer science?"*

It is frustrating that as department heads we still have to fend off these misperceptions. In response, I often point parents to recent U.S. Bureau of Labor Statistics studies, showing that computer-related sectors have job growths faster than any other sector and nearly three times the general growth rate. I also tell them that starting salaries for graduates of my department are higher than any other department at my institution (and much higher than biology-related disciplines). I point out that roughly one-third of the faculty members in my department have significant research endeavors that intersect the life and medical sciences. And I try to talk about the huge range of opportunities to leverage computational modes of thought in other disciplines—medicine, finance, patent law, management, transportation, environment, energy, and social networks. But the fact that I have these discussions suggests that as a field we still have an image problem.

So how do we break this image problem? Clearly there already are efforts at the national level to tackle it. By coalescing viewpoints expressed by many within the field, Jeannette Wing at NSF has been championing the notion of "computational thinking" as "a universally applicable attitude and skill set everyone, not just computer scientists, would be eager to learn and use." The Computing Community Consortium (CCC) has been engaged in a range of activities aimed at answering questions like: *"What attracts the best and brightest minds of a new generation? What are the next big computing ideas, the ones that will define the future of computing, galvanize the very best students, and catalyze research investment and public support?"*

Through events like the "Computing Research that Changed the World" symposium, CCC helps to inform policy makers about the game-changing impact of computing research on the world. A recent CACM article by Cameron Wilson of ACM and CRA's Peter Harsha clearly outlines the challenges and activities aimed at radically revamping computer science education in the K-12 arena, in part with the aim of better communicating to future students the great opportunities encompassed by computer science research and development. Moshe Vardi's forthcoming column in CACM provides an insight into our image issue. All are worth considering as we think about our image.

These are excellent starts to challenging the image problem. But we can't rely on "fixing the problem" from the top down, through policy changes by funding agencies or educational bodies. We also have to examine our own individual institutions. Many of us have started taking very serious looks at our curriculum. Are we showing the many connections between computer science and other disciplines? Can we draw on examples from the life sciences, from finance, from modern engineering challenges, to motivate and frame the discussion of our basic tools and techniques? Are we willing to address the question of whether every computer science student must have a foundational grounding in all aspects of computer science (architecture, operating systems, networks, security, algorithms, complexity, and so on), or are we willing to provide students with some flexibility in designing a curricular path that fits their goals and interests? (Perhaps, if we really believe in abstraction, we would be willing to accept that a student can succeed in computer science without having to know all of the details of the computational engine?)

A number of institutions have already tackled these challenges, and there are several excellent examples available against which institutions could match their own curricular needs. Examples (among many) include Georgia Tech's Threads approach, Cornell's curricular redesign to provide computation-based degrees in Engineering, Arts & Sciences, and Agriculture & Life Sciences, Stanford's new curriculum based around tracks, and MIT's streams approach.

To demonstrate the breadth of impact that computation can have, to attract today's students to the field, and to flexibly support their career paths, we need a bottom-up effort in which departments carefully examine and evolve their curricular offerings. We expect that this issue will be a focus of this year's Snowbird Conference. And hopefully in a few years we won't be fielding those annoying questions about why students should major in computer science.

Eric Grimson, *who recently became Chair of CRA's Board of Directors, is the Bernard Gordon Professor of Medical Engineering and head of the Electrical Engineering and Computer Science department at MIT.* ■

CCC Update

Landmark Contributions by Students in Computer Science

Federal investment in university-based research produces the ideas and the people that make the United States the world leader in innovation.

If our nation wants researchers tomorrow, then our nation must support the education of researchers today. Educating researchers is commonly viewed as an apprenticeship process. Every Ph.D. dissertation breaks new ground, of course, but relatively few are game-changing. Through conducting Ph.D. research and writing a dissertation, the student learns how to conduct research, laying the foundation for a lifelong career.

Sometimes, though, students do work that truly *is* game-changing—they make landmark contributions that change the shape of the field. It's interesting to take a look at some of these to appreciate them and to remind ourselves of the amazing things that students can achieve.

The list below was prepared by a half-dozen leaders in the computing research field, with input from a large number of colleagues. It comes with a host of caveats:

- Any such list is inevitably incomplete.
- It is constrained by the disciplinary knowledge of its creators.
- Individuals' definitions of "landmark" will vary.
- No research ever stands alone: each researcher builds on the work of others, and each major contribution is subsequently amplified in important ways by others.
- This is a list of landmark contributions by students, not an authoritative history of various subfields.
- As it is difficult to predict how recent research will be viewed in the future, the list ends a decade ago.

If you're willing add your suggestions, please go to the CCC blog and nominate your favorite landmark contribution by a student: http://www.cccblog.org/2009/08/28/landmark-contributions-by-students-in-computer- science

- **Use of Boolean logic to model digital circuits:** Claude Shannon at MIT. Shannon is better known for inventing information theory, but this work, his MIT Masters thesis, was a landmark. (1937)
- **Huffman coding:** David Huffman at MIT. Huffman was a Ph.D. student when he invented Huffman coding as a term-paper project in a course taught by Robert M. Fano. (1951)
- **Mathematical foundation of packet communication:** Len Kleinrock at MIT. Kleinrock's Ph.D. dissertation, *Message Delay in Communication Nets with Storage*, established a crucial foundation for the ARPANET revolution, in which he played a central role. (1962)
- **Interactive computer graphics:** Ivan Sutherland at MIT. Sutherland's Sketchpad system—his Ph.D. work—laid the groundwork for several decades of advances in computer graphics. Ed Catmull's 1974 Ph.D. dissertation, supervised by Sutherland at the University of Utah, was another landmark contribution to the field, as was John Warnock's 16-page 1969 Ph.D. dissertation at the University of Utah attacking the hidden surface problem. (1963)
- **Computer vision:** Larry Roberts at MIT. Roberts is best known for his role in the ARPANET effort, but his 1963 MIT Ph.D. dissertation, *Machine Perception of Three-Dimensional Solids*, laid out the entire process for computer vision as we know it today. (1963)
- **Symbolic mathematics:** William A. Martin and Joel Moses at MIT. Martin's 1967 Ph.D. dissertation on symbolic algebra and Moses's 1967 Ph.D. dissertation on symbolic integration launched the MACSYMA project at MIT, the predecessor of today's ubiquitous Mathematica. (1967)
- **The FLEX language and machine:** Alan Kay at the University of Utah. Kay's Ph.D. dissertation, *The Reactive Engine*, defined the FLEX language, the first extensible dynamic graphical interactive object-oriented language, and the direct antecedent of Kay's Smalltalk work at Xerox PARC. It also defined the FLEX machine, a desktop computer with a fully general display and a multiple clipping window user interface, the inspiration for Kay's Dynabook. Kay says: "Most of us regarded what we were doing at PARC as 'phase two' of what we'd already started in graduate school." (1969)
- **The Boyer-Moore theorem prover:** Robert S. Boyer and J Strother Moore at the University of Edinburgh. Moore was a Ph.D. student and Boyer was a postdoctoral research associate. (1971)
- **Efficient graph planarity testing using depth-first search:** Bob Tarjan at Stanford. Tarjan's thesis marked a crucial advance in the depth and elegance of the analysis of data structures for basic computational problems. (1972)
- **Ethernet:** Bob Metcalfe at Harvard. The engineering was done at Xerox PARC, but the invention and analysis of binary exponential backoff as an alternative to the fixed-backoff (and thus unstable) Aloha Network scheme was Metcalfe's Ph.D. dissertation. (1973)
- **BSD Unix:** Bill Joy at Berkeley, working with Bob Fabry and Domenico Ferrari. (1977)
- **VisiCalc:** Bob Frankston and Dan Bricklin at MIT. The spreadsheet—the "killer app" for personal computing—was invented by Frankston and Bricklin while students at MIT, and sold through the company they formed, Software Arts. (1979)
- **Public key cryptography:** Ralph Merkle at Berkeley and Stanford, along with Martin Hellman and Whitfield Diffie. Merkle's 1977 Berkeley Masters thesis and 1979 Stanford Ph.D. dissertation made fundamental contributions. Hellman maintains that the "Diffie-Hellman" key exchange protocol should be called "Diffie-Hellman-Merkle." Public key certificates, as used ubiquitously in HTTPS-based web sites, were introduced in the 1978 MIT Bachelors thesis of Loren Kohnfelder, advised by Len Adleman of RSA fame. (1979)
- **The Sun workstation:** Andy Bechtolsheim at Stanford, working with Forest Baskett. (1982)
- **The Connection Machine:** Danny Hillis at MIT. Hillis co-founded the Thinking Machines Corporation while an MIT Ph.D. student. (1983)
- **Sphinx** (large-vocabulary, speaker-independent, continuous speech recognition): Kai-Fu Lee at Carnegie Mellon. While speech recognition has a long history both before and after Lee's work, his Sphinx system, the subject of his Ph.D. dissertation, was a landmark. (1988)
- **Linux:** Linus Torvalds at the University of Helsinki. Torvalds was a second-year computer science student at the University of Helsinki when he launched the Linux open source operating system project, inspired by Andy Tanenbaum's MINIX operating system and Richard Stallman's GNU project. (1991)
- **BDD-based symbolic model checking:** Ken McMillan at Carnegie Mellon, working with Ed Clarke. *Symbolic Model Checking* (the title of McMillan's Ph.D. dissertation) has transformed hardware and software verification. (1992)
- **Mosaic:** Mark Andreessen at the University of Illinois. Andreessen invented the revolutionary graphical Web browser while an undergraduate at the University of Illinois working at the National Center for Supercomputer Applications. He subsequently founded Netscape Communications. Microsoft licensed Mosaic from UIUC as the foundation for Internet Explorer. (1994)
- **The PCP theorem:** Sanjeev Arora at UC Berkeley. The PCP theorem (Probabilistically Checkable Proofs) is the cornerstone of the theory of computational hardness of approximation. (1994)
- **Google:** Larry Page and Sergey Brin at Stanford. The Page Rank algorithm is central to Google's success. (Note that many earlier web search innovations were also due to students; for example, Brian Pinkerton at the University of Washington invented WebCrawler in 1994, the first successful full-text web search engine.) (1998)
- **Akamai** (content delivery networks): Danny Lewin at MIT, working with Tom Leighton. (1999)
- **Peer-to-peer file sharing:** Shawn Fanning at Northeastern University. Fanning was an undergraduate at Northeastern University when he wrote the code for Napster, inventing the concept of peer-to-peer file sharing, which has many important legal uses in addition to the questionable ones enabled by Napster. (1999) ■

New Directions at DARPA from Page 1

a new Transformational Convergence Technology Office, focused on potentially game-changing fundamental research involving universities and other broader research communities, some well outside the DoD world view (more on this in a later issue). These appointments were preceded by the selection of Zach Lemnios, Chief Technology Officer at MIT Lincoln Laboratory, as the Director of Defense Research & Engineering (essentially, DARPA's "boss").

It is now up to each of us, and each of our institutions, to **seize the opportunity and re-engage.**

Ed Lazowska *holds the Bill & Melinda Gates Chair in Computer Science & Engineering at the University of Washington.* **Dave Patterson** *holds the E.H. and M.E. Pardee Chair of Computer Science at UC Berkeley. Both are past Chairs of the Computing Research Association.* ■

Department Chairs and Lab/Center Directors

CRA Conference at Snowbird

MARK the DATES!

— July 18-20, 2010 —

See Draft Program in

***January 2010 Edition** of CRN*

Crossflow Data from the CI Fellows Project

The Computing Community Consortium (CCC) and the Computing Research Association (CRA), with funding from the National Science Foundation, recently selected sixty recipients of Computing Innovation Fellowships. The Fellows are new PhD graduates who will assume one- to two-year postdoctoral positions at host organizations including universities, industrial research laboratories, and other organizations that advance the field of computing and its positive impact on society.

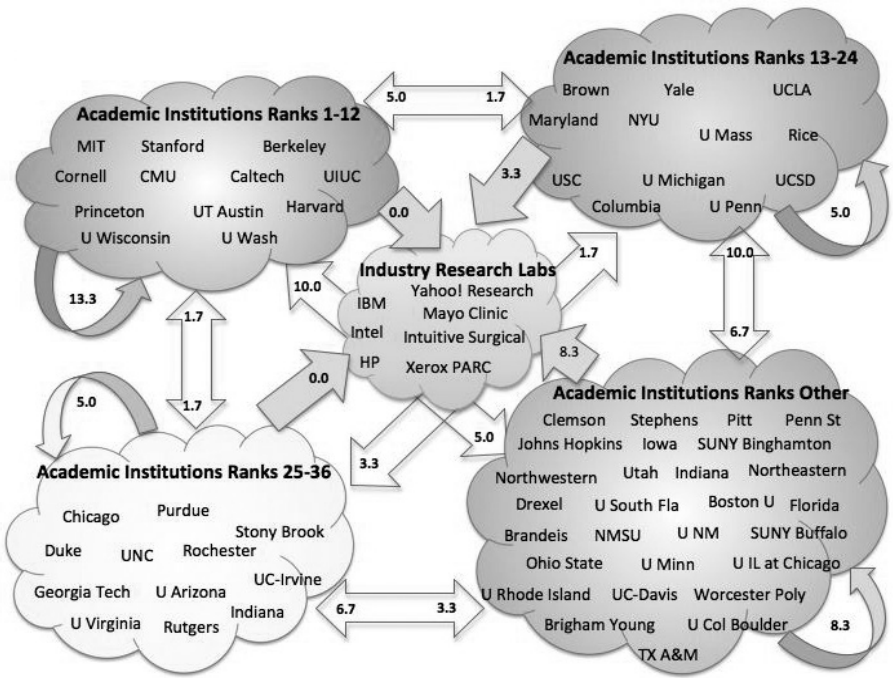
The goals of the CIFellows project (http://cifellows.org) are to retain new PhDs in research and teaching and to support intellectual renewal and diversity in the computing fields at U.S. organizations. Part of that effort was to promote crossflow across types of institutions; that is, to encourage mentor pairings outside of "all the top schools sending students to all the other top schools."

To measure crossflow, we group the institutions sending and hosting Fellows using the 1994 NRC Computer Science Rankings in the same way they are grouped in reports of CRA's annual Taulbee Survey. In this arrangement there are four groups: Ranks 1-12, 13-24, 25-36, and those ranked higher than 36 or unranked in the 1994 rankings. This is admittedly an imperfect basis for grouping; the ratings are somewhat outdated and apply only to the institution's Computer Science program, even though CI Fellows or mentors may be from Computer Engineering or Information programs rather than CS. However, it serves the purpose of a rough measure of institutional peers, and has the advantage of being familiar to CRA members.

The diagram shows the distribution of CI Fellows who flow along each possible pathway between the five institution groups, from their degree-granting institution to their host institution. The five groups pictured are the four academic groups plus one for industry research labs (which host students but of course do not grant degrees). The institutions in each group are listed on the appropriate "cloud." The groups with NRC ranking numbers include all schools within that group, whether they participated in CI Fellows or not; the "other ranks" and industry groups list only institutions participating in CI Fellows. The numbers are percentages of the sixty Fellows who followed that path. On the double-headed arrows, the numbers at each end are percentage of Fellows going to that group from the other. Arrows that exit and enter the same group represent the percentage of Fellows remaining in the same group, but moving to a host location different from their degree-granting institution.

For an earlier article on the CIFellows, see p. 1 of the September 2009 issue of CRN at: http://www.cra.org/CRN/issues/0909.pdf

Crossflow: % of total mentor/mentee pairs



Expanding the Pipeline from Page 2

for meetings, on-site mentoring, and professional development. The students meet with leaders in their fields who interact with them during and after the conferences.

Regional Model

The New England area is the first regional ELA program (NE ELA). Representatives from several institutions interested in minority student achievement have come together to offer in-person experiences and collaborations that can have a strong impact across the area. NE ELA convenes workshops with local leaders focused on offering professional development programs for university students, an online resource for minority scholars in the area, and outreach to K-12 teachers. As a result of these workshops, in April 2009 ELA sponsored the first New England Undergraduate Computer Science workshop, working with the New England Computer Science Chairs (NECSC) consortium.

Local Model

Local ELA networks of support are created where a sufficient critical mass of underrepresented students exists. An excellent example is the EL Alliance student group at the University of Texas at Austin (UTCS ELA), which has seen a great deal of growth since its inception and is a model for student groups on other campuses. There are 200 URMs in the Department of Computer Science, and UTCS ELA has 65 members. The group holds regular meetings, hosts guest speakers, shares information through a Facebook group, hosts faculty lunches, tutors younger students, and holds events for middle and high school students. They have developed a guide to help other campuses establish similar groups, which is being shared through the ELA and beyond.

Invitation to Participate

The EL Alliance invites anyone interested in the success of minority scholars to participate. Students are encouraged to join and receive information about the range of opportunities described above. Faculty and administrators are encouraged to join our dynamic and growing network, to participate as a source of information about your programs, and to learn more about supporting the minority students on your campus. Join at: http://www.empoweringleadership.org.

Richard A. Tapia *is University Professor and Maxfield-Oshman Professor in Engineering at Rice University, Director of Rice's Center for Excellence and Equity in Education, and the Director of the Empowering Leadership Alliance.*

CRA Board Member Elections 2010

Nominations Due: ***December 2, 2009***

Details:

http://www.cra.org/elections/nominees.09.html

REMINDER TO DEPARTMENT CHAIRS

(Ph.D-Granting Institutions)

Taulbee Surveys Were Due November 9

Please make certain your survey has been submitted to: http://www.cra.org/taulbee

Questions?

Contact: survey@cra.org

CRA-W Grad Cohort for Women Conference

April 23-24, 2010
Bellevue, WA

Application Deadline: February 1, 2010

http://www.cra.org/Activities/craw/gradcohort/index.php

CRA Service Awards 2010

Distinguished Service Award* and *A. Nico Habermann Award

Nominations Due: ***January 29, 2010***

Details: http://www.cra.org

The Critical Role of Science and Technology for National Defense from Page 1

mantra and marching orders for the organization for which we will apply resources and focus.

- ***Accelerate Delivery of Technical Capabilities to Win the Current Fight.*** We must solve the most difficult near-term challenges on the battlefield and expeditiously transition compelling concepts to our forces. This work is focused on rapid prototyping, demonstration and transition of early concepts in days to weeks. It requires innovation and early risk assessment to evaluate and triage for capability impact. It requires intimate connection with the user and builds on the Research Triple to pull innovative ideas from the contractor base. And, it requires new contracting and delivery concepts.
- ***Prepare for an Uncertain Future.*** The focus of the imperative is to counter and create technological surprise. This has been squarely in the DARPA lane since its inception, but is foundational to the full scope of S&T functions within DDR&E. Countering technological surprise cannot be done in isolation. We have reinvigorated our interaction with the intelligence community in the areas of technical intelligence, horizon scanning, net assessments and red-teaming to further develop a full understanding of both blue and red future capabilities. Creating technological surprise hinges on developing advances in autonomy; specifically, areas like perception, understanding, dynamic re-planning, reasoning and self organization will be critical to creating new defense capabilities. Integrated sensing and decision support remains an elusive but important goal, and will require advances in tasking, object recognition in structured and unstructured data, unsupervised learning, robust signature-level fusion, human-machine interface and open source data mining, just to name a few.
- ***Reduce the Cost, Acquisition Time and Risk of Major Defense Acquisition Programs.*** The newly formed Systems Engineering and Developmental Test and Evaluation Directorates will engage alongside our traditional DDR&E Technology Maturity Assessment efforts to provide deep systems analysis and comprehensive technical assessments across the Department. With these new responsibilities, I have a seat at the table during the USD(AT&L)-led Defense Acquisition Boards which provide oversight and milestone approval for the approximately 150+ major defense acquisition programs (MDAPs) across the Department. The inputs of the DDR&E team have already proven effective at identifying potential issues and providing technical assistance for many programs early in the acquisition cycle.
- ***Develop World Class Science, Technology, Engineering and Mathematics (STEM) Capability for the DoD and the Nation.*** This imperative is foundational to the others. Without a first-rate workforce to innovate and manage the DoD S&T enterprise the other imperatives will be unachievable. STEM leadership for the Department is managed within our Research Directorate and targets middle school through post-doctorate education. Examples of our commitment to this effort include: DoD laboratory scientists spending time at local schools; providing internships for college students at our laboratories; and an array of scholarship opportunities. We recently formed a DoD STEM Board of Directors to align efforts throughout the Department and to oversee this critically important initiative.

These imperatives represent an enterprise effort to include the full resources of our DoD laboratories, agencies, Service S&T organizations as well as our industry partners. Only with full transparency and collaboration can we achieve optimum effectiveness for the warfighters.

Computer Science at the Nexus

As the importance of software in today s defense systems grows, developing new methods that provide advanced techniques for developing, deploying and testing software will become ever more important in accelerating the delivery of technical capabilities. These techniques will provide developmental environments that allow collaboration while protecting IP, provide supply chain and manufacturing models, and include tools for dealing with configuration complexity through advances in autonomous computing. Hybridized environments where mixed virtual and physical systems offer opportunities for spiral development will be important, as well as new approaches that allow small teams of developers to control and develop large programs using new techniques that provide effective code reuse and self-checking to provide functional guarantees. With many rapid capabilities being built on existing platforms the need for legacy system refresh and highly portable systems will also become urgent. Techniques like robust virtual machines, open source chips and automated verification and validation tools are needed. With these advances software-based systems will become more pervasive and will provide a platform for rapidly developing and deploying new capabilities.

To provide a hedge against uncertain futures, advances are needed in many basic research areas like quantum information sciences, computer network defense and computational sustainability. Two enduring problems that help create surprise include the ability to exploit valuable information in large data sets and autonomous systems. A registered spatial, social and economic framework will allow fusion of many data sources, while advances in reasoning and learning will provide automated methods of finding causal relationships. Data storage and retrieval using metadata structures will continue to be an active area of research, as well as structured knowledge spaces in which questions can be quickly answered by trained analysts.

Advances in perception that provide machine situational awareness are critical to truly autonomous systems to allow their operation without GPS guidance. Research in inference, complex environmental representation and intent recognition are necessary, as are advances in reasoning and understanding. Self-organization is another important research area for autonomous systems and includes new techniques for creating dynamic organizational structures and hierarchies for mission success.

As we continue to find ourselves fighting asymmetric threats, future advances in human-social-cultural modeling and interactions will continue to be important. Here, we will need new fundamental advances in mathematical modeling that allow the highly nonlinear models to be developed and tested using real social interactions as datasets. Open source data and the ability to mobilize users we do not control will be instrumental to advances in this area. Media countermeasures and the mathematics of "tipping points" will be central to enlisting the help of local populations to fight extremism and insurgents. Integral to the fielding of these important new capabilities is the issue of Human-Machine Interactions (HMI). Advances in HMI will allow warfighters to interact with machines naturally, using speech and gestures. To accomplish this we will need new advances in techniques for sharing mental models, goals, plans and environmental representations.

With the cost, schedule and performance challenges of many MDAPs, the need for new techniques in complex systems development has never been more important. Complex system development will include new advances in virtual environments that allow government and industry developers to concurrently develop operational concepts and define their physical and information systems. New algorithmic approaches that quantify uncertainty, efficiently scale for multi-grid simulations and provide multi-level and multi-discipline representations are required to further the current state of the art. Not only will we need advances in development environments and new algorithms, but High Performance Computing will have to evolve such that new software approaches can reap the benefits of multiple cores and processors that can self-manage autonomic computing approaches.

Advances like the ones discussed above will require increased enrollments in STEM. Digital education approaches offer the promise of new machine tutors that adapt to the learning styles of students, are proactive in redirecting their misconceptions about physical phenomena, and that can help them learn and retain more effectively using games as a conduit. Many of these same approaches can be used for immersive training of new recruits for both battlefield operations and on the use of technology systems.

A Path Forward: A Vannevar Bush Redux

The innovative engine and expertise in our country have fueled our status as a world leader for the past century. Vannevar Bush s insightful vision after World War II still applies today. We need to invest heavily in science and technology to provide the foundation for our future endeavors in both the civilian and military markets. Computer science expertise will be central to every aspect of our science and technology portfolio. We need to mentor, lead and encourage our youth to contribute to our Science, Technology, Engineering and Mathematics enterprise, and to consider service in our government to support national security. Our investment in Federally Funded Research and Development Centers continues to be vital and an integral part of our overall national security S&T strategy. We need to continue to give these folks meaningful and fulfilling work; they will not let us down.

As we embark on a new era of Defense Research, the computer science research community has the opportunity to bring together all of the elements of the Research Triple and make a significant impact on our success in this new environment. ■

As Director of Defense Research and Engineering, **the Honorable Zachary J. Lemnios** serves as the Chief Technology Officer for the Department of Defense. **Mr. Alan R. Shaffer** is responsible for formulating, planning, and reviewing the DoD Research, Development, Test, and Evaluation (RDT&E) programs, plans, strategy, priorities, and execution of the DoD RDT&E budget.

End Notes:

[1]Office of Scientific Research and Development, *Science The Endless Frontier, A Report to the President* by Vannevar Bush, (Washington, DC: GPO, July 1945).
[2]Gary P. Pisano and Willy C. Shih, Restoring American Competitiveness, *Harvard Business Review* (July-August 2009).
[3]Patrick M. Cronin, ed., *Global Strategic Assessment 2009: America's Security Role in a Changing World* (Washington, D.C.: National Defense University Press), 2009.
[4]U.S. Department of Defense, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, *Defense Science Board 2006 Summer Study on 21st Century Strategic Technology Vectors, Vol. 1 Main Report* (Washington, D.C.: Defense Science Board, 2007).
[5]Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology and Committee on Science, Engineering, and Public Policy, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (Washington D.C.: The National Academies Press, 2007).

CRA Announces Career Mentoring Workshop

The sixth biennial Career Mentoring Workshop will be offered by the Computing Research Association February 22 and 23, 2010 at the Fairmont Hotel in Washington, DC. This exciting workshop provides career advice and mentoring activities for senior graduate students, post docs, assistant professors, and individuals just starting as industrial researchers in computer science. The workshop, consisting of a series of panels, is interspersed with opportunities to network with senior researchers and representatives from the NSF, DARPA, and NIH.

The panels being offered at this workshop cover a wide range of exciting topics. They include Planning Your Research Career; Career Networking; Teaching, Mentoring and Managing Students; Preparing a Tenure Dossier; Time Management and Family Life; Advice from Early Career Faculty; and Writing Grant Proposals.

A prestigious list of speakers has already been confirmed for this workshop. They include: Jan Cuny (NSF), Mary Fernandez (AT&T Labs Research), Kathleen Fisher (AT&T Labs Research), Dan Grossman (University of Washington), Laura Haas (IBM Almaden), Susanne Hambrusch (Purdue), Mary Jean Harrold (Georgia Tech), Kim Hazelwood (University of Virginia), Jeff Hollingsworth (University of Maryland), Chad Jenkins (Brown), Margaret Martonosi (Princeton), J Moore (University of Texas at Austin), Dave Patterson (UC Berkeley), Bobby Schnabel (Indiana University), Mary Lou Soffa (University of Virginia), Valerie Taylor (Texas A&M), and Terry Yoo (NIH).

Applications are now being accepted for this workshop. There will be a registration fee to cover the cost of the workshop and limited financial assistance is available to those who qualify. Applications are due **no later than December 15, 2009.** While anyone may apply for this workshop, preference will be given to senior graduate students, post docs, assistant professors, and individuals just starting as industrial researchers in computer science. Applications can be found at: **www.cra.org/Activities/workshops/academic.careers/2010/index.html.** If you have any questions, you can email Patrick Krason at pkrason@cra.org.

Don't miss this exciting opportunity to jumpstart your career. Apply now to ensure a spot in this space-limited workshop. ▮

CISE Bytes

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

Personnel Updates

CISE welcomes the following new program directors who joined us since March 2009: Mohamed Gouda (CNS/CSR and Trustworthy Computing), from University of Texas at Austin; Le Gruenwald (IIS/III), returning from University of Oklahoma to serve a second tour of duty; Pamela Jennings (IIS/HCC), from Banff New Media Institute at the Banff Centre (Canada); Tracy Kimbrel (CCF/AF), from IBM T.J. Watson Research Center; Xiaoyang (Sean) Wang (IIS/III), from University of Vermont; and Sam Weber, (CNS/CRI and Trustworthy Computing), from IBM T.J. Watson Research Center.

We thank these program directors who are returning to their home institutions: Amy Baylor (IIS/HCC), to Florida State University; Jim French (IIS/III), to University of Virginia—Charlottesville; Karl Levitt, to the University of California—Davis; and E.K. Park, to University of Missouri, Kansas City. We celebrated the retirement of IIS program director Larry Brandt, who served NSF for 33 years. We will miss him!

A special welcome to our AAAS Fellow, Erwin Gianchandani, who will be working on energy and health IT for CISE, and to our two Albert Einstein Distinguished Educator Fellows, Kera Johnson and Camsie Matis, both working on K-12 education with our EWF program.

I am delighted to announce the new CISE Advisory Committee members who joined us this fall: Bruce Hajek (UIUC), Charles Isbell (Georgia Tech), Susan Landau (Sun), Andrew Ng (Stanford), Keshav Pingali (UTexas/Austin), Jennifer Rexford (Princeton), Julian Goldman (Mass. General Hospital) and Bill Weihl (Google). Many thanks to the CISE AC members who rotated off this past summer, all of whom did double duty by serving two terms: Annie Anton (NCSU), Randy Bryant (CMU), Vint Cerf (Google), Dwight Gourneau (NAMTech), Marc Snir (UIUC), Margaret Wright (NYU), and Ellen Zegura (Georgia Tech).

We Spent It All!

Finally, a huge thanks to the administrative and scientific staff of CISE for their Herculean efforts in spending the CISE allotment of the America Recovery and Reinvestment Act ("stimulus") money by the end of fiscal year 2009. To calibrate, NSF's annual budget is $6B and ARRA gave NSF $3B, of which approximately $2.5B had to have been spent by September 30, 2009. It would be great if the community expressed its appreciation to the CISE staff for their hard work in getting ARRA funds out the door—dropping an email to your program director or a staff person who helped you would go a long way. ▮

Message from the CISE AD from Page 3

for as our cyber adversaries get more sophisticated, so must we.

For the other three scientific interests, engagement by the computing community is less obvious or less direct, but instrumental.

For energy, environment, and sustainability, it is not just reducing the 2 percent of our direct carbon footprint, but helping sectors in the other 98 percent reduce theirs. When we talk about the smart grid, smart homes, smart buildings, smart cars, smart transportation systems, and others, what makes them "smart?" Computing! Our sensors, our software, our devices, our networks. When earth scientists want to model the climate at regional and decadal scales, they require new computational models, algorithms, methods, and software to do the desired simulation, prediction, analyses, and visualization. More fundamentally, computing has a tradition of measuring the complexity of algorithms and performance of systems in terms of time and space; suppose we were to consider energy as a third basic resource to measure? How would that change the design and choice of algorithms we use and the architecture of the systems we build?

The computing community also has a lot to offer as we move toward patient-centered healthcare: new fundamental biological discoveries using computational methods and tools, intelligent decision-making, sophisticated data analysis, participatory sensing, robotic surgery, new interactive wall-sized touch display technologies for telemedicine, and more. It is not about digitizing current healthcare processes, but transforming the very nature of healthcare delivery and patient monitoring.

For education, there is a new movement afoot within our community to get the "C" in STEM. Toward this goal, the May 20, 2009 Hill event "Bringing Innovative Computing Curriculum Across the Digital Divide," sponsored by ACM, CRA, CSTA, IEEE-USA, Microsoft, NCWIT, and SWE, discussed the state of computer science education at the K-12 level and a new computing curriculum and teacher preparation course (see: http://intotheloop.gseis.ucla.edu/exploring.html) funded by Microsoft, NSF/CISE, and UCLA.

As for the research modes, first and foremost, NSF views all the research we fund as potentially transformative. Often the breakthrough is a result of steadily following a research agenda with a long-term vision; sometimes it is the serendipitous side product of the line of research being pursued. And yes, sometimes the research idea fails. That is, after all, the nature of research.

Second, NSF welcomes proposals for high-risk, high-return research and for multi-disciplinary projects. We also have specific programs to emphasize our support for high-risk, high-return research—for example, CISE's Expeditions program, and/or for multi-disciplinary research, such as NSF's Cyber-enabled Discovery and Innovation. We also encourage our program directors to use EAGERs (http://www.nsf.gov/pubs/policydocs/pappguide/nsf09_29/gpg_index.jsp) for ambitious, but less-tested-out ideas. NSF even started experimenting with "sandpits," a process successfully launched in the UK that is used in merit review to nurture emerging interdisciplinary fields.

As indicated in the FY10 Budget Request, NSF plans to increase its support for young investigators, both the number of graduate research fellowships (GRFs) and the number of CAREER awards. To the computing community: Please take advantage of these opportunities by encouraging all eligible students to apply for GRFs and by mentoring junior faculty to write compelling CAREER proposals.

Finally, NSF continues to encourage the academic community to work with the private sector, and vice versa. Many of the results of CISE-sponsored research translate into start-ups and thus fuel the innovation engine. CISE likes to brag about those wins because they help make our case for how basic research leads to economic prosperity. And so we've come full circle.

Serve the Nation

"We also need to engage the scientific community directly in the work of public policy." [President Obama, NAS]

Now, if ever, is the right time to be in DC. Policy-makers are thirsting to hear from the computing research community, be it on cybersecurity, broadband, spectrum management, cyberlearning, and who knows what else in the future. The political climate is right for science, engineering, and technology. Serve the computing community, serve the nation!

Jeannette M. Wing *is Assistant Director of NSF for CISE.* ▮

Professional Opportunities

CRN Advertising Policy

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

Carnegie Mellon University
School of Computer Science
Faculty Positions

The School of Computer Science seeks junior faculty candidates with a strong interest in research, outstanding academic credentials, and an earned Ph.D. Candidates for tenure-track appointments should also have a strong interest in graduate and undergraduate education.

The School of Computer Science at Carnegie Mellon University spans a wide range of topics in computer science and the application of computers to real-world systems. It houses the Computer Science Department; Human Computer Interaction Institute; Institute for Software Research; Lane Center for Computational Biology; Language Technologies Institute; Machine Learning Department and the Robotics Department.

Applications should include curriculum vitae, statement of research and teaching interests, 1-3 representative papers, and names and email addresses of three or more individuals who have been asked to provide letters of reference. Applicants should arrange for reference letters to be sent directly to the Faculty Search Committee (see website for instructions), to arrive before January 15th, 2010. The Search Committee will not directly request letters.

Applications should indicate citizenship and, for non-US citizens, current visa status.

Please refer to http://www.cs.cmu.edu/~scsdean for details and submission guidelines. Applications will be accepted from November 1, 2009 through January 1, 2010. Please contact the Search Committee at faculty-Search@cs.cmu.edu with questions.

Carnegie Mellon is an affirmative action/equal opportunity employer; we invite and encourage applications from women and minorities.

The College of William and Mary
Computer Science Department
Faculty Position Assistant Professor

We invite applications for a tenure-track assistant professor position in Computer Science for Fall 2010. We are interested in individuals with research expertise in all areas of computer science. Applicants must hold a Ph.D. in computer science or a related field at the time of appointment, must have a strong research record, and should have an interest in teaching.

The College of William and Mary consistently ranked in the elite group of the Best National Universities Doctoral by U.S. News and World Report has committed to a multi-year effort to strengthen its computer science research program.

The department currently consists of fourteen faculty members who support B.S., M.S., and Ph.D. programs. More information about the department and university can be obtained at:

http://www.cs.wm.edu

Applicants should submit a current resume, research and teaching statements, the names of at least three references, and supporting documents they consider most relevant. We prefer that the application materials be submitted as PDF attachments in email to 09search@CS.WM.EDU. If necessary, hard copy may be submitted to:

Faculty Search Committee
Department of Computer Science
The College of William & Mary
P.O. Box 8795
Williamsburg, VA 23187-8795

Review of applications will begin December 15 and continue until the position is filled. The College is an EEO/AA employer.

Cornell University
School of Electrical and Computer Engineering
Tenure-Track Faculty Positions

The School of Electrical and Computer Engineering at Cornell University, Ithaca, New York invites applications for tenure-track faculty positions in all areas of electrical and computer engineering. High priority is given to overall originality and promise of the candidate's work, with secondary priority given to the specific area of specialization. Applicants must hold a doctorate in an appropriate field, must have demonstrated an ability to conduct outstanding research, and show promise for excellent teaching. We anticipate hiring at the Assistant Professor level, but applications at other levels will be considered; salary and rank are commensurate with qualifications and experience.

Applicants should submit a curriculum vitae, a research statement, a teaching statement, three recent publications, and complete contact information for at least three references. Personal statements summarizing teaching experience and interests, leadership efforts and contributions to diversity are encouraged.

Applications must be made on-line using the School's system at: http://fast.ece.cornell.edu. Applications received by January 8, 2010 will receive full consideration.

The School of Electrical and Computer Engineering, and the College of Engineering at Cornell embrace diversity and seek candidates who will create a climate that attracts students of all races, nationalities and genders. We strongly encourage women and underrepresented minorities to apply.

Cornell University seeks to meet the needs of dual career couples, has a Dual Career program, and is a member of the Upstate New York Higher Education Recruitment Consortium to assist with dual career searches.

Cornell University is an affirmative action, equal opportunity educator and employer.

D. E. Shaw Research
Early Career Scientists and Engineers: Computational Biochemistry

Extraordinarily gifted early career scientists and engineers sought to join a rapidly growing New York-based research group pursuing an ambitious, long-term project aimed at achieving major scientific advances in the field of biochemistry and fundamentally transforming the process of drug discovery. Successful candidates will work closely with a number of the world's leading biologists, chemists, and computer scientists, and will have the opportunity not only to participate in an exciting entrepreneurial venture with considerable economic potential, but to make groundbreaking contributions within the fields of biology, chemistry, and medicine.

D. E. Shaw Research is seeking scientists and engineers with zero to five years of experience who have degrees in chemistry, biology, physics, computer science, engineering, and mathematics from top-tier universities. Serious consideration will be given to candidates with extraordinary records of achievement in the natural sciences and/or scientific programming, exceptional quantitative abilities, and superb communication skills.

The group's current research activities are aimed at the discovery and development of innovative scientific techniques to direct unprecedented computational power toward the solution of key problems in the fields of biomolecular simulation and design. This research effort is being financed by the D. E. Shaw group, a global investment and technology development firm with more than US $30 billion in aggregate investment capital. The project was initiated by the firm's founder, Dr. David E. Shaw, and operates under his direct scientific leadership.

We are prepared to offer above-market compensation to candidates of truly exceptional ability. Interested applicants should send a resume to cra-sa@career.DEShawResearch.com

EOE

D. E. Shaw Research
Software Development: Supercomputer for Computational Biochemistry

Exceptional software developers sought to write scientific code for a massively parallel special-purpose supercomputer. Successful hires will join an interdisciplinary research group pursuing an ambitious, long-term project aimed at achieving major scientific advances in the fields of biochemistry and molecular biology.

Ideal candidates will have outstanding low-level programming ability and excellent verbal and written communication skills. Relevant areas of expertise might include parallel programming, multicore systems, compilers, assembly language programming, or architectural simulation, but specific knowledge of any of these areas is less critical than exceptional intellectual ability and a demonstrated track record of achievement. We will consider candidates at all levels of experience and are prepared to reward exceptionally well-qualified individuals with above-market compensation. Candidates will primarily be considered for opportunities in New York and Silicon Valley.

Please send your resume to cra-asd@career.DEShawResearch.com

EOE

D. E. Shaw & Co., L.P.
New York, NY & Cupertino, CA
Software Developer

The D. E. Shaw group is looking for top-notch, innovative software developers to help it expand its tech venture and proprietary trading activities. We're a global investment and technology development firm with approximately US $29 billion in aggregate investment capital and a decidedly different approach to doing business. The application of advanced technology is an integral part of virtually everything we do, from developing computationally intensive strategies for trading in securities markets around the globe to designing a supercomputer intended to fundamentally transform the process of drug discovery. Developers at the firm work on a variety of interesting technical projects including real-time data analysis, distributed system development, and the creation of tools for mathematical modeling. They also enjoy access to some of the most advanced computing resources in the world. If you're interested in applying your intellect to challenging problems of software architecture and engineering in a stimulating, fast-paced environment, then we'd love to see your resume.

You can learn more about us and apply online at:

https://www.deshaw.com/recruit/jobs/Ad/CRA/Prog

Members of the D. E. Shaw group do not discriminate in employment matters on the basis of race, color, religion, gender, pregnancy, national origin, age, military service eligibility, veteran status, sexual orientation, marital status, disability, or any other protected class.

Drexel University
College of Information Science & Technology
Information Security/Assurance, Tenure-Track Faculty

Drexel University's College of Information Science & Technology (IST) invites applicants for a tenure-track position in Information Security/Assurance at the assistant, associate, or full professor rank, depending on qualifications. A Ph.D. is required, and academic and industrial experience is preferred. Candidates must be U.S. citizens to qualify for several key funding opportunities. Candidates for senior positions should have established research records and success in obtaining external research funding. Joint appointments with other Drexel academic units are also a possibility.

The successful candidate will have some combination of the following characteristics:

Relevant industry experience as a:
- network manager
- information security officer
- cyber crimes investigator

Certifications such as:
- Global Information Assurance Certification
- Certified Information Systems Security Professional
- Information Systems Security Engineering Professional

Established research/funding record with agencies such as:
- Department of Justice
- Department of Homeland Security
- F.B.I.
- N.S.A.

The successful candidate will be able to demonstrate understanding of the principles, practices, and techniques used to secure distributed applications, information, and the infrastructure of distributed information systems. Potential research and teaching areas include security planning, policies and models, threats and attacks, and the use and integration of distributed system security mechanisms for confidentiality, authentication, access control, and intrusion detection. He/she should also be able to provide an overview of the legal, ethical, and professional issues involved in information security, particularly with respect to risk management, security planning, security technologies, and security implementation and maintenance.

Drexel is a privately endowed technology university founded in 1891. With approximately 20,000 students, it has one of the largest undergraduate cooperative education programs in the nation, with formal relationships in place with over 1500 local, national, and multinational companies. Drexel is located on Philadelphia's Avenue of Technology

Professional Opportunities

in University City and at the hub of the academic, cultural, and historical resources of the nation's fourth largest metropolitan region. Philadelphia is also the midpoint of a mid-Atlantic technology corridor that stretches from New York City (100 miles north) to Washington, DC (135 miles south).

To apply for this position, please apply online at:

www.drexeljobs.com/applicants/Central?quickFind=73051

or visit

www.drexeljobs.com and search position number 3179

Drexel University is an Equal Opportunity/Affirmative Action Employer. The iSchool at Drexel is especially interested in qualified candidates who can contribute to the diversity and excellence of the academic community.

Duke University

Department of Computer Science

Tenure-Track Faculty Positions

The Department of Computer Science at Duke University invites applications and nominations for tenure-track faculty positions at an assistant professor level, to begin August 2010. We are interested in strong candidates in all active research areas of computer science, both core and interdisciplinary areas, including algorithms, artificial intelligence, computational economics, computer architecture, computer vision, database systems, distributed systems, machine learning, networking, security, and theory.

The department is committed to increasing the diversity of its faculty, and we strongly encourage applications from women and minority candidates.

A successful candidate must have a solid disciplinary foundation and demonstrate promise of outstanding scholarship in every respect, including research and teaching. Please refer to www.cs.duke.edu for information about the department and to www.provost.duke.edu/faculty/ for information about the advantages that Duke offers to faculty.

Applications should be submitted online at www.cs.duke.edu/facsearch. A Ph.D. in computer science or related area is required. To guarantee full consideration, applications and letters of reference should be received by January 3, 2010.

Durham, Chapel Hill, and the Research Triangle of North Carolina are vibrant, diverse, and thriving communities, frequently ranked among the best places in the country to live and work. Duke and the many other universities in the area offer a wealth of education and employment opportunities for spouses and families.

Duke University is an affirmative action, equal opportunity employer.

The Hong Kong University of Science and Technology

Department of Computer Science and Engineering

Faculty Positions

The Department of Computer Science and Engineering is one of the largest departments in the School of Engineering. The Department currently has 40 faculty members recruited from major universities and research institutions around the world, with about 1000 students (including 600 undergraduate and 170 postgraduate students). The medium of instruction is English. More information on the Department can be found at http://www.cse.ust.hk/.

The Department will have at least two tenure-track faculty openings at Assistant Professor/Associate Professor/Professor levels for the 2010-2011 academic year. We are looking for faculty candidates with interests in multidisciplinary research areas related to computational science and engineering such as bioinformatics and financial engineering. Strong candidates in core computer science and engineering research areas will also be considered. Applicants at Assistant Professor level should have an earned PhD degree and demonstrated potential in teaching and research.

Salary is highly competitive and will be commensurate with qualifications and experience. Fringe benefits include medical/dental benefits and annual leave. Housing will also be provided where applicable. For appointment at Assistant Professor/Associate Professor level, initial appointment will normally be on a three-year contract, renewable subject to mutual agreement. A gratuity will be payable upon satisfactory completion of contract.

Applications should be sent through e-mail including a cover letter, curriculum vitae (including the names and contact information of at least three referees), a research statement and a teaching statement (all in PDF format) to csrecruit@cse.ust.hk. Priority will be given to applications received by 28 February 2010. Applicants will be promptly acknowledged through e-mail upon receiving the electronic application material.

(Information provided by applicants will be used for recruitment and other employment-related purposes.)

Illinois Institute of Technology

Department of Computer Science

Tenure-Track Assistant Professor

Applications are invited for a tenure-track assistant professor position in Computer Science beginning Fall 2010. Highly qualified candidates from all areas of computing will be considered. Applicants from experimental and systems areas are especially encouraged. Excellence in research, teaching and obtaining external funding is expected.

The Department offers B.S., M.S., and Ph.D. degrees in Computer Science and has research strengths in distributed systems, information retrieval, computer networking, intelligent information systems and algorithms. The Department has strong connections to Fermilab and Argonne National Laboratories and local industry.

IIT, located within 10 minutes of downtown Chicago, has entered an exciting new era of prominence in science, technology, and engineering and has hired several top administrators to help build on the university's reputation, excellence in research and education, and diversity. IIT is an Equal Opportunity Affirmative Action Employer.

Evaluation will start December 1, 2009 and continue until position is filled. Applicants should send a detailed curriculum vitae, a statement of research and teaching interests, and the names and email addresses of at least four references to:

Computer Science Faculty Search Committee
Department of Computer Science
Illinois Institute of Technology
10 W. 31st Street
Chicago, IL 60616
Phone: 312-567-5152
Email: search@cs.iit.edu
http://www.iit.edu/csl/cs

Indiana University

School of Informatics and Computing

Faculty Positions

The School of Informatics and Computing at Indiana University, Bloomington, invites applications for faculty positions. We are particularly interested in tenure-track candidates in the areas of:

- Health Informatics
- Cyber-infrastructure
- Software and Systems
- Data Mining, Machine Learning and Search
- Artificial Intelligence
- Human-Computer Interaction
- Graphics and Visualization; and
- Algorithms

Most positions are expected to be filled at the junior level but outstanding senior candidates will be considered, particularly in the broad area of cyber-infrastructure, software and systems.

All candidates should have a Ph.D. in computer science or any relevant field. Successful applicants are expected to conduct an independent research program, establish research collaborations with colleagues in the school and beyond, participate successfully in scholarly publication and obtaining research funding, teach relevant undergraduate and graduate courses, and mentor graduate students. They should be committed to helping with the ongoing development of a cutting-edge, interdisciplinary School.

The IU Bloomington School of Informatics and Computing is the first of its kind and among the largest in the country, with a faculty of more than 60 full time members, more than 400 graduate students, and widely subscribed undergraduate programs. It offers undergraduate degrees in Computer Science and in Informatics, M.S. degrees in Computer Science, Bioinformatics, Human Computer Interaction Design, and Security Informatics, and Ph.D. degrees in Computer Science and in Informatics. The School has received public recognition as a "top-ten program to watch" (Computerworld) thanks to its excellence and leadership in academic programs, interdisciplinary research, placement, and outreach. The school offers excellent work conditions, including attractive salaries and research support, low teaching loads, and world-class computing and library facilities. The school continues strong student growth, over 30% in the last two years. The school hired 5 new faculty last year and plans to hire a similar number this year.

Located in the wooded, rolling hills of southern Indiana, Bloomington is a culturally thriving college town with a moderate cost of living. It is renowned for its top-ranked music school, performing and fine arts, historic campus, cycling traditions, active lifestyle, and natural beauty.

Applicants should submit a curriculum vitae, a statement of research and teaching, and the names of three references (six for associate and full professor candidates) using the recruit link at http://informatics.indiana.edu/hiring (preferred) or by mail to:

Chair, Faculty Search Committee
School of Informatics and Computing
919 E 10th Street
Bloomington, IN 47408

Questions may be sent to hiring@informatics.indiana.edu. To receive full consideration completed applications must be received by December 31, 2009. However, applications received after this date will be considered until all positions are filled.

Indiana University is an Equal Opportunity/Affirmative Action employer. Applications from women and minorities are strongly encouraged.

International Computer Science Institute

Networking Group

Postdoctoral Fellow

The International Computer Science Institute (ICSI) invites applications for a postdoctoral Fellow position in the area of high-performance network security monitoring. The Fellow will be working with ICSI's networking group on novel approaches to highly concurrent traffic analyses in large-scale network environments. Candidates should have a strong systems background in either networking or concurrent systems.

ICSI is an independent not-for-profit Institute closely affiliated with the Berkeley campus of the University of California. The appointment will be for one year, and a Ph.D. in computer science (or an equivalent degree) is required for the position.

See http://www.icir.org/jobs.html for more information about the position, including instructions on how to apply.

Lawrence Berkeley National Laboratory

Alvarez Postdoctoral Fellowship

Lawrence Berkeley National Laboratory (Berkeley Lab) is located in the San Francisco Bay Area on a 200-acre site in the hills above the University of California's Berkeley campus and is managed by the University of California for the U.S. Department of Energy. A leader in science and engineering research for 75 years, Berkeley Lab is the oldest of the U.S. Department of Energy's national laboratories.

The Computational Research Division and the National Energy Research Scientific Computing Center (NERSC) at the U.S. Department of Energy's Lawrence Berkeley National Laboratory invite applications for the Luis W. Alvarez Fellowship in Computational Science. The fellowship allows recent graduates with a Ph.D. (or equivalent) to acquire further scientific training at one of the leading facilities for scientific computing and to develop professional maturity for independent research.

RESEARCHERS & POST-DOCTORAL FELLOWS

The Advanced Digital Sciences Center (ADSC) invites applications for full-time research positions in Singapore. From its space in Singapore's newest science and engineering research complex at Fusionopolis, ADSC is led by outstanding faculty from the College of Engineering at the University of Illinois at Urbana-Champaign, under funding provided by Singapore's Agency for Science, Technology and Research (A*STAR). ADSC's signature project is the Human Sixth Sense Programme (HSSP), which addresses the seamless integration of man, machine and the environment in the digital age. Technology innovations from ADSC will provide many exciting opportunities for new corporate spin-offs and economic development.

Research areas of interest include communications as well as networking and control, computer systems, cyber-physical infrastructures, multimedia and human-machine interfaces, trusted information management, and related application areas. Candidates working in interdisciplinary areas related to these fields are strongly encouraged to apply. Qualifications for researchers: PhD in Electrical Engineering, Computer Engineering, Computer Science or a closely related field; outstanding academic credentials and demonstrated excellence in research; and the ability to supervise graduate and undergraduate student while working with post-doctoral fellows and other researchers.

Applications from senior researchers are especially encouraged. Post-doctoral fellows in the same areas are also sought. Salary is open, based on qualifications. To ensure full consideration, applications must be received by December 1, 2009; however; applications will be accepted until the positions are filled. Interviews may take place during the application period, but final decisions will not be made until after this date. **Further information, including instructions for applying, can be found through the ADSC home page, www.adsc.illinois.edu. Questions may be directed to adscjobsearch@csl.illinois.edu. ADSC is an employer committed to diversity and principles of equal opportunity.**

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Professional Opportunities
Continued on Page 10

Professional Opportunities

Berkeley Lab's Computing Sciences organization provides high-performance computing (HPC) resources and expertise to researchers across the country, advancing computational science of scale. Research areas in the Computational Research Division include:

- Research in applied mathematics and computer science to enable new applications to use Peta-scale platforms
- Investigating energy efficient approaches to computing problems
- Developing and supporting robust and reliable data management and bioinformatics tools
- Researching and developing software to support extreme-scale computing
- Developing mathematical modeling tools for complex scientific problems
- Developing system software and tools to improve the robustness of Peta-scale platforms
- Researching system architectures to improve system performance
- Advancing peta-scale scientific data management
- Evaluating new and promising computing and network technologies
- Developing tools to enable science on next generation networks
- Researching methods to control and manage dynamic circuit networks

The Luis W. Alvarez Fellowship in Computational Science aims to achieve these goals by supporting recent graduates (within the past three years) in a related field with a strong emphasis on computing or computational science.

In addition to the intellectual and cultural advantages of being a member of the LBNL community, we offer employees outstanding health and welfare benefits, and programs for a secure retirement that are considered to be among the finest.

Learn more about this opportunity and for complete applications instructions visit:

http://jobs.lbl.gov/LBNLCareers/details.asp?jid=23431&p=1

Berkeley Lab is an Affirmative Action/Equal Opportunity Employer committed to the development of a diverse workforce.

Lehigh University

Department of Computer Science and Engineering

Faculty Opening

Applications are invited for a tenure-track Assistant Professor position in Bioinformatics in the Computer Science and Engineering Department (http://www.cse.lehigh.edu) of Lehigh University. The position starts in August 2010.

The potential to establish a successful research program and teach effectively at both the undergraduate and graduate level are essential prerequisites. The successful applicant will hold a Ph.D. in Computer Science, Computer Engineering, Bioinformatics, or a closely related field. Outstanding candidates in areas of computer science with a direct connection to bioinformatics will be considered. Applicants should have an interest in teaching core courses in computer science as well as courses in their research area. The successful applicant will be expected to contribute directly to Lehigh's bioengineering program.

The faculty of the Computer Science and Engineering (CSE) department includes IEEE and ACM fellows, and four NSF CAREER award winners. We offer B.A., B.S., M.S., and Ph.D. degrees in Computer Science and jointly oversee B.S., M.S., and Ph.D. degree programs in Computer Engineering with the department of Electrical and Computer Engineering.

We also offer a B.S. in Computer Science and Business with the College of Business and Economics. Lehigh offers a degree in Bioengineering and has a variety of research programs related to bioinformatics and medical informatics, including biomedical image processing, biopharmaceuticals, algorithms for mining large genomic databases, and assistive robotics. Lehigh is developing a biotech cluster that includes a vibrant undergraduate program, a new graduate program in bioengineering, both parts of a university-level initiative in healthcare research. The bioengineering program draws associated faculty from nearly all engineering and several science departments and will provide opportunities for the successful applicant to develop collaborative research projects.

Lehigh is a private institution that is consistently ranked among the top 40 national research universities by U.S. News & World Report and is rated "most selective" by both Barron's and Peterson's guides. Located in Bethlehem, Pennsylvania, Lehigh is 80 miles west of New York City and 50 miles north of Philadelphia, providing an accessible and convenient location that offers an appealing mix of urban and rural lifestyles.

Applications can be submitted online at http://www.cse.lehigh.edu/faculty-search, and should include a cover letter, vita, and both teaching and research statements. In addition, please provide the names and email addresses of at least three references. Applications will be evaluated until the position is filled, but materials should be received by January 15, 2010 for full consideration.

Lehigh University is an Equal Opportunity/Affirmative Action Employer. Lehigh University provides comprehensive benefits including domestic partner benefits (see http://www.lehigh.edu/~insloan). Questions concerning this search may be sent to faculty-search@cse.lehigh.edu.

Masdar Institute of Science and Technology

Abu Dhabi, UAE

Post-doctoral Position in Smart Power Grids

A postdoctoral research position to be held at the Masdar Institute in collaboration with MIT is immediately available in the area of artificial learning and human-machine interaction in smart power grids. The postdoc will perform research on technologies for smart devices that help users to manage, acquire, and distribute energy resources within a competitive electricity market. Specific focus will be placed on investigating (1) distributed learning and control algorithms and (2) human-machine interface technologies for these devices. The Masdar Institute has a unique and exciting opportunity in this research area due to its alignment with Masdar City.

For details, please see: http://www.mit.edu/~jcrandal/postdocad.pdf

Massachusetts Institute of Technology

Department of Electrical Engineering and Computer Science

Faculty Positions

The Department of Electrical Engineering and Computer Science (EECS) seeks candidates for faculty positions starting in September 2010. Appointment would be at the assistant or untenured associate professor level. In special cases, a senior faculty

THE UNIVERSITY OF MICHIGAN, ANN ARBOR
DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
COMPUTER SCIENCE AND ENGINEERING DIVISION
FACULTY POSITION

Applications and nominations are solicited for a faculty position in the Computer Science and Engineering (CSE) Division as part of an interdisciplinary cluster hire funded by the University President to strengthen expertise in the area of Data Mining, Learning, and Discovery with Massive Datasets across multiple departments. Expertise is particularly sought in visual analytics and information visualization.

Candidates with a focus in this area are encouraged to apply. However, all computer science and engineering applications will be considered. Applications must be received by January 11, 2010.

Qualifications include an outstanding academic record, a doctorate or equivalent in computer engineering or computer science, and a strong commitment to teaching and research.

To apply please complete the form at:
http://www.eecs.umich.edu/eecs/jobs/csejobs.html

Electronic applications are strongly preferred, but you may alternatively send resume, teaching statement, research statement and names of three references to:

Professor Karem A. Sakallah, Chair, CSE Faculty Search
Department of Electrical Engineering and Computer Science
University of Michigan
2260 Hayward Street
Ann Arbor, MI 48109-2121

The University of Michigan is a Non-Discriminatory/Affirmative Action Employer with an Active Dual-Career Assistance Program. The college is especially interested in candidates who can contribute, through their research, teaching, and/or service, to the diversity and excellence of the academic community.

Professional Opportunities

appointment may be possible. Faculty duties include teaching at the graduate and undergraduate levels, research, and supervision of student research. We will consider candidates with backgrounds and interests in any area of electrical engineering and computer science. Faculty appointments will commence after completion of a doctoral degree.

Candidates must register with the EECS search website at https://eecs-search.eecs.mit.edu, and must submit application materials electronically to this website. Candidate applications should include a description of professional interests and goals in both teaching and research. Each application should include a curriculum vitae and the names and addresses of three or more individuals who will provide letters of recommendation. Letter writers should submit their letters directly to MIT, preferably on the website or by mailing to the address below. Please submit complete application by December 15, 2009.

Send all materials not submitted on the website to:

Professor W. Eric L. Grimson
Department Head, Electrical
Engineering and Computer Science
Massachusetts Institute of Technology
Room 38-401

M.I.T. is an equal opportunity/affirmative action employer.

Max Planck Institute for Software Systems (MPI-SWS)

Tenure-Track Openings

Applications are invited for tenure-track and tenured faculty positions in all areas related to the design, analysis and engineering of software systems, including programming languages, formal methods, security, distributed, networked and embedded systems, databases and information systems, and human-computer interaction. A doctoral degree in computer science or related areas and an outstanding research record are required. Successful candidates are expected to build a team and pursue a highly visible research agenda, both independently and in collaboration with other groups. Senior candidates must have demonstrated leadership abilities and recognized international stature.

MPI-SWS, founded in 2005, is part of a network of eighty Max Planck Institutes, Germany's premier basic research facilities. MPIs have an established record of world-class, foundational research in the fields of medicine, biology, chemistry, physics, technology and humanities. Since 1948, MPI researchers have won 17 Nobel prizes. MPI-SWS aspires to meet the highest standards of excellence and international recognition with its research in software systems.

To this end, the institute offers a unique environment that combines the best aspects of a university department and a research laboratory:

a) Faculty receive generous base funding to build and lead a team of graduate students and post-docs. They have full academic freedom and publish their research results freely.

b) Faculty have the opportunity to supervise doctoral theses, teach graduate and undergraduate courses, and have the flexibility to incorporate teaching into their research agenda.

c) Faculty are provided with outstanding technical and administrative support facilities as well as internationally competitive compensation packages.

Funds have been committed to grow the institute to a strength of 17 tenured and tenure-track faculty, and about 100 doctoral and post-doctoral positions. Additional growth through outside funding is expected. We maintain an open, international and diverse work environment and seek applications from outstanding researchers regardless of national origin or citizenship. The working language is English; knowledge of the German language is not required for a successful career at the institute.

The institute is located in Kaiserslautern and Saarbruecken, in the tri-border area of Germany, France and Luxembourg. The area offers a high standard of living, beautiful surroundings and easy access to major metropolitan areas in the center of Europe, as well as a stimulating, competitive and collaborative work environment. In immediate proximity are the MPI for Informatics, Saarland University, the Technical University of Kaiserslautern, the German Center for Artificial Intelligence (DFKI), and the Fraunhofer Institutes for Experimental Software Engineering and for Industrial Mathematics.

Qualified candidates should apply online at:

http://www.mpi-sws.org/application

The review of applications will begin on January 4, 2010, and applicants are strongly encouraged to apply by that date; however, applications will continue to be accepted through January 2010.

The institute is committed to increasing the representation of minorities, women and individuals with physical disabilities in Computer Science. We particularly encourage such individuals to apply.

FACULTY POSITIONS
Computer Science
NYU ABU DHABI

New York University is establishing a new comprehensive liberal arts campus in Abu Dhabi, the capital of the United Arab Emirates. New York University Abu Dhabi (NYUAD) will consist of a highly selective liberal arts college (Arts, Humanities, Social Sciences, Sciences, and Engineering), distinctive graduate programs, and a world-class Institute for advanced research, scholarship, and creative work. NYU in New York and NYUAD will be integrally connected, together forming the foundation of a unique global network university, actively linked as well to NYU's study and research sites on five continents.

As part of a multi-year hiring plan, NYUAD's Division of Science, Technology, Engineering and Mathematics invites applications for faculty positions in Computer Science, at all ranks, to begin September 2010. We are seeking individuals with a strong record of accomplishment in research and teaching, in any area of computer science, and who have leadership skills to establish a new program in Computer Science. Faculty may spend time at NYU in New York and at its other global campuses. The terms of employment are highly competitive compared to U.S. benchmarks and include housing and educational subsidies for children.

The deadline for submission is ***December 1, 2009***. Applicants must submit a cover letter, curriculum vitae, statement of research and teaching interests, and the names and addresses of three references in PDF format in order to be considered. Please do not submit preprints or publications at this time. Complete instructions for the application process and additional information can be found at **http://nyuad.nyu.edu/human.resources/open.positions.html**. If you have any questions, please e-mail **nyuad.science@nyu.edu**.

NEW YORK UNIVERSITY
ABU DHABI

NYU Abu Dhabi is an Equal Opportunity/Affirmative Action Employer.

Montclair State University

Department of Computer Science

Assistant/Associate Professor

The Department of Computer Science invites applications for a tenure track position in Information Technology. The Department's 14 faculty members support the BS in Computer Science with an ABET CAC accredited track, the BS in Information Technology, the BS/MS and MS in Computer Science. The position's teaching focus is information technology major courses. Additional teaching includes a variety of computer science courses at all levels to ethnically diverse students. The position requires the development and maintenance of an active research program with deep student involvement. The ability to work as a member of interdisciplinary teams as the Department develops and modifies computing undergraduate and graduate programs with a planned doctoral program in computational science is essential.

Candidates must have a Ph.D. in Computer Science or a related discipline before August 15, 2010. Candidates must have good communication skills. All faculty members are expected to have an ongoing research program, to actively foster student learning, to be involved in professional activities, and to develop external funding support for their scholarship.

Salary and range is dependent on qualifications. Starting date: September 1, 2010. Send hardcopy that includes cover letter, C.V., at least three professional references, statement of research interests, teaching philosophy with experience, and professional goals to:

Search Committee - V - F23
Department of Computer Science
1 Normal Avenue
Montclair State University
Montclair, NJ 07043

Screening begins immediately and continues until the position is filled.

Montclair State University is located 14 miles west of New York City on a beautiful 200-acre suburban campus.

Additional information can be found on the MSU website at:

http://www.montclair.edu

Old Dominion University, Norfolk, VA

College of Sciences

Richard T. Cheng Endowed Chair in Computer Science

Applications are invited for the Richard T. Cheng Chair at the tenured rank of full professor. We are seeking an internationally recognized scholar with a significant ongoing externally funded research program to fill this endowed position. The Cheng Chair will be expected to play a leadership role in departmental research and to mentor junior faculty, post doctoral fellows and graduate students. The department is particularly interested in attracting scholars who will enable interdisciplinary collaboration. Minimum requirements include a PhD in Computer Science or a closely related field.

The Computer Science Department offers BS, MS and PhD degrees and features research programs in the areas of bioinformatics, computational science, digital libraries, computer and wireless networking, security, and computer simulation. Old Dominion University has major collaborative opportunities with the Virginia Modeling and Simulations Center, NASA Langley, the Thomas Jefferson National Laboratory, the Eastern Virginia Medical School, and the DoD Joint Training Analysis and Simulation Center.

Applicants should submit a letter of interest and curriculum vitae that includes contact information for four references. Applications, nominations or inquiries should be sent to: chengsearch@cs.odu.edu or to:

Chair, Cheng Chair Committee
Computer Science Department
3300 E & CS Bldg
Old Dominion University
Norfolk, VA 23529-0223.

Screening of applicants will begin immediately and continue until the position is closed. Old Dominion University is an affirmative action, equal opportunity institution and requires compliance with the Immigration Reform and Control Act of 1986.

Old Dominion University

College of Sciences

Computer Science 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 has recently hired a new chair and seeks candidates for multiple tenure track/tenured positions at senior and junior levels.

Candidates for full or associate professor must show evidence of strong, active 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. Department is particularly interested in attracting researchers who will enable interdisciplinary collaboration. Areas of interest are broad and include bioinformatics, computational biology, parallel computing, modeling and simulation, computational science, databases/data mining, but all strong applications will be considered.

Professional Opportunities
Continued on Page 12

Professional Opportunities

Old Dominion University is a public institution located in Norfolk, Virginia which is the hub of the world's largest natural harbor and is regarded as a national leader in business and industry. Nearby Virginia Beach, where many of the faculty members live, is the largest city in Virginia, has 36 miles of some of the best beaches on the Atlantic Ocean and Chesapeake Bay and is a major year-round tourist center on the East Coast. In a 2009 US News poll, Virginia Beach was rated as the best place in the US to raise a family. Located nearby are historic Jamestown, Yorktown, and Williamsburg. Norfolk also profits from its relationship with the Navy and its proximity to Washington, D.C. and the Outer Banks of North Carolina. The University enrolls approximately 22,000 students and is situated on a 180-acre campus bounded by the Lafayette and Elizabeth Rivers.

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.

Old Dominion University

Department of Computer Science
Postdoctoral Position

A postdoctoral position is available immediately in the general area of bioinformatics and computational biology in the Department of Computer Science at Old Dominion University. Under the supervision of Dr. Desh Ranjan, the postdoctoral researcher will have an opportunity to work in the area of development of algorithmic methods and software tools to solve problems in life sciences. The position requires a PhD in bioinformatics/computational biology or a related area like computer science, mathematics, or life sciences. The hired person will be expected to perform basic and applied research, publish, and present the results obtained, provide mentorship to graduate students, and assist with development of new grant proposals.

Initial appointment will be for one year with the possibility of renewal for an additional year based on performance and availability of funds.

The candidates should send their CV, a brief research statement, and two letters of recommendation to dranjan@cs.odu.edu. Review of applicants will begin immediately and continue until the position is 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 Computer Science
Faculty Positions in High-Performance Computing

The Department of Computer Science at Purdue University invites applications for tenure track faculty positions in the area of computational science and engineering, and high-performance computing and systems, beginning August 2010. We are looking for candidates with a demonstrable research record in these areas and a commitment to multidisciplinary research. Up to three positions at the Assistant Professor rank are available. A joint appointment with another department within the College of Science or the College of Engineering is likely for candidates with interdisciplinary research interests.

Purdue faculty have had a pioneering role in computational science and engineering research and education, and are currently involved in several large-scale computing projects: e.g., the CSCAPES Institute funded by the Department of Energy, and the PRISM project funded by the National Nuclear Safety Administration. The Computing Research Institute facilitates collaborations in high-performance computing by bringing computational scientists and domain scientists together. Interdisciplinary graduate programs in Computational Science and Engineering, and Computational Life Sciences help train graduate students across departmental boundaries.

The Department of Computer Science offers a stimulating and nurturing academic environment. Forty-four faculty members direct research programs in areas including bioinformatics, computational science and engineering, databases, machine learning, networking, programming languages, security, software engineering, systems, theory, and visualization. The department has implemented a strategic plan for future growth and has recently moved into the Lawson building. Further information about the department is available at http://www.cs.purdue.edu.

All applicants should hold a PhD in computer science or a closely related discipline, be committed to excellence in teaching, and have demonstrated potential for excellence in research. Salary and benefits are highly competitive. Applicants should apply online at:

https://hiring.science.purdue.edu

Review of applications will begin on October 1, 2009, and will continue until the positions are filled. Purdue University is an Equal Opportunity/ Equal Access/Affirmative Action employer fully committed to achieving a diverse workforce.

Santa Clara University

Department of Mathematics & Computer Science
One Tenure-Track Assistant Professor Position

The Department of Mathematics and Computer Science at Santa Clara University invites applications for a tenure-track Assistant Professor position starting in September 2010 from candidates with expertise in scientific computation or statistics and interest in mathematical biology, computational physics or chemistry, or environmental science.

Application deadline is January 20, 2010. For more information regarding application submissions, see:

www.scu.edu/hr/careers/faculty.cfm

Stanford University

Department of Computer Science
Faculty Opening

The Department of Computer Science at Stanford University invites applications for a tenure-track faculty position at the junior level (Assistant or untenured Associate Professor). We give higher priority to the overall originality and promise of the candidate's work than to the candidate's sub-area of specialization within Computer Science.

We are seeking applicants from all areas of Computer Science, spanning theoretical foundations, systems, software, and applications. We are also interested in applicants doing research at the frontiers of Computer Science with other disciplines, especially those with potential connections to Stanford's main multidisciplinary initiatives: Energy, Human Health, Environment and Sustainability, the Arts and Creativity, and the International Initiative.

Applicants must have completed (or be completing) a Ph.D., must have demonstrated the ability to pursue a program of research, and must have a strong commitment to graduate and undergraduate teaching. A successful candidate will be expected to teach courses at the graduate and undergraduate levels, and to build and lead a team of graduate students in Ph.D. research. Further information about the Computer Science Department can be found at http://cs.stanford.edu. The School of Engineering website may be found at http://soe.stanford.edu.

Applications should include a curriculum vitae, brief statements of research and teaching interests, and the names of at least four references. Candidates are requested to ask references to send their letters directly to the search committee. Applications and letters should be sent to: Search Committee Chair, c/o Laura Kenny-Carlson, via electronic mail to search@cs.stanford.edu.

The review of applications will begin on January 4, 2010, and applicants are strongly encouraged to submit applications by that date; however, applications will continue to be accepted until the position is filled, but no later than May 1, 2010.

Stanford University is an equal opportunity employer and is committed to increasing the diversity of its faculty. It welcomes nominations of and applications from women and members of minority groups, as well as others who would bring additional dimensions to the university's research and teaching missions.

Swarthmore College

Computer Science Department
Visiting Assistant Professor Position

Applications are invited for a two-year Visiting Assistant Professor position beginning August 2010.

Swarthmore College is a small, selective liberal arts college located in a suburb of Philadelphia. The Computer Science Department offers majors and minors in computer science at the undergraduate level. Applicants must have teaching experience and should be comfortable teaching a wide range of courses at the introductory and intermediate level. We are particularly interested in candidates who specialize in theory and algorithms or in systems areas, however, we will consider candidates from all areas of CS. A Ph.D. in CS by or near the time of appointment is preferred (ABD is required). We expect to begin interviewing in early February 2010.

See http://cs.swarthmore.edu/jobs for application submission information and more details about the position.

Swarthmore College is an equal opportunity employer. Applications from women and members of minority groups are encouraged. Applications will be accepted until the position is filled.

Texas State University-San Marcos

Department of Computer Science
Tenure-Track Position

Applications are invited for a tenure-track position at the rank of Assistant, Associate or Professor. Consult the department recruiting page at http://www.cs.txstate.edu/recruitment/ for job duties, required and preferred qualifications, application procedures, and information about the university and the department.

Texas State University-San Marcos is an equal opportunity educational institution and as such does not discriminate on grounds of race, religion, sex, national origin, age, physical or mental disabilities, or status as a disabled or Vietnam era veteran. Texas State is committed to increasing the number of women and minorities in faculty and senior administrative positions. Texas State University-San Marcos is a member of the Texas State University System.

Toyota Technological Institute at Chicago

Computer Science Department
Faculty Positions at All Levels

Toyota Technological Institute at Chicago (TTI-C) is a philanthropically endowed degree-granting institute for computer science located on the university of Chicago campus. The Institute is expected to soon reach a steady-state of 12 traditional faculty (tenure and tenure track), and 12 limited term faculty. Applications are being accepted in all areas, but we are particularly interested in:

- Theoretical computer science
- Speech processing
- Machine learning
- Computational linguistics
- Computer vision
- Scientific computing
- Programming languages

Positions are available at all ranks, and we have a large number of limited term positions currently available.

For all positions we require a Ph.D. Degree or Ph.D. candidacy, with the degree conferred prior to date of hire. Submit your application electronically at:

http://ttic.uchicago.edu/facapp/

Toyota Technological Institute at Chicago is an Equal Opportunity Employer

University at Buffalo, The State University of New York

Computer Science and Engineering Department
Faculty Position

The CSE Department invites excellent candidates in all core areas of Computer Science and Engineering, especially experimental and systems areas, to apply for an opening at the assistant professor level. The department is affiliated with successful centers devoted to biometrics, bioinformatics, biomedical computing, cognitive science, document analysis and recognition, high performance computing, and information assurance.

Candidates are expected to have a Ph.D. in Computer Science/Engineering or related field by August 2010, with an excellent publication record and potential for developing a strong funded research program.

Applications should be submitted by December 31, 2009 electronically via recruit.cse.buffalo.edu.

The University at Buffalo is an Equal Opportunity Employer/Recruiter.

University of Central Arkansas

Computer Science Department
Faculty Position

The Computer Science Department at the University of Central Arkansas (UCA) invites applications to fill one tenure-track faculty position at the assistant professor level to start in Fall 2010. Applicants should have a PhD degree in computer science and/or computer engineering. All fields will be considered, however, applicants who complement current department strengths will be given preferential consideration. A strong commitment to excellence in teaching and to research involving students is expected.

The department offers BS (accredited by ABET) and MS degree programs

Professional Opportunities

and enjoys strong support from local corporations. UCA is committed to excellence in undergraduate and graduate education. It has been ranked in the top tier of universities in the south. For more information about the department and the university, visit www.cs.uca.edu.

Applicants should send their curriculum vitae, statements of teaching and research interests, transcripts, and at least three letters of reference to the CS Search Committee Chair at CSsearch@list.uca.edu. Review will begin on October 1, 2009 and continue until the position is filled.

UCA is an Equal Opportunity Affirmative Action Employer

University of Chicago
Department of Computer Science
Faculty Positions

The Department of Computer Science at the University of Chicago invites applications from exceptionally qualified candidates in all areas of Computer Science for faculty positions at the ranks of Professor, Associate Professor, Assistant Professor, and Instructor. The University of Chicago has the highest standards for scholarship and faculty quality, and encourages collaboration across disciplines.

The Chicago metropolitan area provides a diverse and exciting environment. The local economy is vigorous, with international stature in banking, trade, commerce, manufacturing, and transportation, while the cultural scene includes diverse cultures, vibrant theater, world-renowned symphony, opera, jazz, and blues. The University is located in Hyde Park, a pleasant Chicago neighborhood on the Lake Michigan shore.

All applicants must apply through the University's Academic Jobs website,

http://academiccareers.uchicago.edu/applicants/Central?quickFind=50533

A cover letter, curriculum vitae including a list of publications, a statement describing past and current research accomplishments and outlining future research plans, a description of teaching experience, and a list of references must be uploaded to be considered as an applicant. Candidates may also post a representative set of publications, to this website. The reference letters can be sent by mail or e-mail to:

Chair, Department of Computer Science
The University of Chicago
1100 E. 58th Street, Ryerson Hall
Chicago, IL 60637-1581

Or to: recommend-50533@mailman.cs.uchicago.edu (attachments can be in pdf, postscript or Microsoft Word).

Please note that at least three reference letters need to be mailed or e-mailed to the above addresses and one of them must address the candidate's teaching ability. Applicants must have completed all requirements for the PhD except the dissertation at time of application, and must have completed all requirements for the PhD at time of appointment. The PhD should be in Computer Science or a related field such as Mathematics or Statistics. To ensure full consideration of your application all materials [and letters] must be received by November 15. Screening will continue until all available positions are filled. The University of Chicago is an Affirmative Action/Equal Opportunity Employer.

University of Connecticut
Computer Science & Engineering Department
Faculty Initiative in Biomedical Informatics

The University of Connecticut (UConn) invites applications and/or nominations for multiple tenure-track faculty positions to form the core of an interdisciplinary, integrated team in biomedical informatics (BMI). The team will be comprised of faculty appointed at all ranks; qualified candidates will be considered for tenure. This BMI team will conduct research, education, and outreach within the Biomedical Informatics Center (BMIC) of the Connecticut Institute for Clinical and Translational Science (CICATS: http://cicats.uchc.edu/).

The BMIC will be led by a senior, internationally recognized researcher and/or educator in medical informatics, with responsibilities to: 1. head the BMIC and the BMI section of UConn's application to the NIH's Clinical and Translational Science Award program; 2. unify research efforts in medical and clinical informatics with the 8-10 faculty currently at UConn in bioinformatics; 3. propose and develop graduate programs in BMI; and, 4. lead the effort to create a department of BMI. The senior leader of BMIC must hold a medically-oriented degree (MD, PharmD, or Public Health/Nursing PhD) with a background in medical informatics, clinical informatics, translational informatics, public-health informatics, or a related field, or a computer/information science-oriented degree (PhD) with background in a medical, public health, or a related field. Candidates should possess a track record of leadership/scholarship in informatics with archival publications in relevant informatics, medical, or computing venues and research funding in areas such as medical informatics or clinical informatics systems. This position will include classroom teaching.

Applicants for a non-leadership position can hold either a medically-oriented degree (MD, PharmD, or Public Health/Nursing PhD) with a background in medical informatics, clinical informatics, translational informatics, public-health informatics, or a related field, or a computer/information science-oriented degree (PhD) with background in a medical, public health, or a related field. Applicants should demonstrate scholarship in informatics or a related field with publications in relevant venues and research funding in related areas. This position will include classroom teaching and engaging in research efforts in medical and clinical informatics.

Appointments will be aligned with a clinical or basic science department at the UConn Health Center, the School of Engineering or another appropriate university department at the rank of Assistant, Associate, or Full Professor, commensurate with qualifications.

Depending upon appointment, candidates may work at the University of Connecticut's main campus located in Storrs, in the scenic Northeast corner of the state, and/or the campuses at Avery Point, Hartford, Stamford, Torrington, Waterbury, and West Hartford, as well as the Health Center in Farmington, a suburb of Hartford. The University is in the midst of a 20-year, state-funded $2.3 billion initiative to enhance the research mission. In addition to the Schools of Engineering, Medicine, and Dental Medicine and the graduate programs in biomedical sciences, there are several Practice Based Research Networks whose access to electronic medical records creates outstanding research opportunities in Informatics.

Appointment type, rank, and salary will be commensurate with qualifications.

Electronic Applications preferred to include curriculum vitae and the names and contact information for at least five references, sent in .pdf format (all application materials in one file) to:

Noreen Wall at BMI-Search@engr.uconn.edu or Noreen@engr.uconn.edu

Applications may also be sent via mail to:

Engineering Dean's Office
261 Glenbrook Road, Unit 2237
Storrs CT 06269-2237

Review of applications will begin immediately and will continue until the positions are filled. (Search # 2010023)

University of Houston
Department of Computer Science
Chair

The Department of Computer Science at the University of Houston (www.cs.uh.edu) is looking for a new Department Chair. The department is a highly dynamic place on an ascending trajectory with 256 undergraduates, 310 graduate students out of which 88 are PhD students. The University of Houston is located in one of the most vibrant metropolitan areas in the nation. Currently, the Department has 22 tenure-track faculty members, slated to expand to 30 faculty members within the next four years. In FY2009, the department received over $6 M in competitive research funding from federal, state, and corporate sources. All our recently recruited faculty members have federal support for their research, and three are recipients of the prestigious CAREER Award from the National Science Foundation.

The Department has strong research programs in Computer Systems (high performance computing, networks, real-time systems, security), Data Analysis (information retrieval, data mining, machine learning) and Computational Life Sciences (biomedical image analysis, bioinformatics, biometrics, graphics). The Department's research is the epitome of innovation, mixing advances in core computer science areas with pace-setting multi-disciplinary programs in computational medicine, biology, and psychology. The combination of fundamental research and innovations has led to numerous local, national and international collaborations, the strongest of which are with the Texas Medical Center.

The University of Houston, one of the largest in the nation with over 36,000 students, is located in one of the most vibrant metropolitan areas. Houston, the 4th largest U.S. city, is the epicenter of the energy industry, features the largest medical center in the world, and hosts the Johnson Space Center. The Department's research laboratories have joint programs with laboratories from the local medical schools and hospitals, NASA, and the high-tech industry.

The ideal Department Chair candidate should be an established leader in his/her field and widely known in the computer science community and beyond. S/he should have proven managerial and marketing skills running another department or a major lab. S/he should also have excellent people skills and be privy to the academic, fund-raising, and publicity system's inner workings in the United States. The Chair's designated mission would be to further accelerate the department's ascendancy to top ranking positions.

Qualified applicants need to apply on-line at http://www.cs.uh.edu/chair-search. A CV, at least six recommendation letters, and a vision statement are required. In the vision statement the applicants should clearly describe their vision for the growth of the department and how their track record will support the University mission. The deadline for submission of all documents (including recommendation letters) is January 31, 2010. However, screening of applications and interviews will be ongoing and applicants are encouraged to apply as soon as possible. Interested applicants may further inquire with the Chair of the Search Committee, Prof. Pavlidis at ipavlidis@uh.edu , 713-743-0101.

The University of Houston is an Equal Opportunity/Affirmative Action institution. Minorities, women, veterans and persons with disabilities are encouraged to apply.

University of Kansas
Electrical Engineering and Computer Science Department
Tenure-Track Assistant Professor

The University of Kansas Electrical Engineering and Computer Science Department seeks to hire one tenure-track assistant professor to support its computer systems design research area. We are seeking to fill research and teaching needs in digital system design, multi-core architectures, systems-on-chip, electronic system-level design, computer system (hardware and software) synthesis, FPGA synthesis, and high-assurance systems. The successful applicant will have an earned PhD in computer engineering, computer science, or related area. Faculty members in our department are expected to develop nationally recognized research programs while supporting our undergraduate and graduate teaching missions. The appointment will be effective as negotiated.

Apply at https://jobs.ku.edu and search position no. 00004009.

A complete application includes a letter of application, curriculum vitae, and the names and addresses of three references. Applications will be reviewed beginning January 15, 2010 and will be accepted until the position is filled.

EO/AA

University is an affirmative action, equal opportunity educator and employer.

University of Missouri
Computer Science Department
Postdoctoral Fellow Position

The Computer Science Department at University of Missouri is seeking applications for a postdoctoral fellow in the area of Computer Graphics, Computer Vision and Shape Modeling.

Initial appointment as a postdoctoral fellow will be for one year with possible renewal for an additional 2-3 years. A PhD in computer science or a closely related field is required. Applications for the postdoctoral position are accepted on a continuing basis.

Interested candidates should send his/her curriculum vitae and contact information for three references to Dr. Ye Duan at: duanye@missouri.edu

University of Missouri is an equal opportunity/affirmative action employer. Women and minorities are encouraged to apply.

University of North Florida
School of Computing
Assistant Professor

Tenure-track assistant professor position in the School of Computing at the University of North Florida available. See:

http://www.unf.edu/ccec/cis/SoChtml/SoCPositions.06.html

University of Notre Dame
Department of Computer Science and Engineering
Assistant or Associate Professor

The Department of Computer Science and Engineering at the University of Notre Dame invites applications for positions at the rank of Assistant or Associate Professor. Exceptional candidates in all areas of specialization will be considered,

Professional Opportunities
Continued on Page 14

Professional Opportunities

and the area of bioinformatics is an especially high priority for us this year.

The Department offers a PhD degree as well as accredited undergraduate Computer Science and Computer Engineering degrees. There are approximately seventy-five students in the PhD program and over one hundred majors in the undergraduate programs. Our faculty are engaged in cutting-edge and highly visible research in algorithms, bioinformatics and computational biology, computer architecture and nanotechnology, computer security, data mining / machine learning, computer vision/image analysis, and networks / systems. The Gates Foundation recently awarded a $20 million grant to Biology and CSE faculty in the bioinformatics area, and the Semiconductor Research Corporation (SRC) together with the state of Indiana and the city of South Bend recently announced the Midwest Institute for Nanoelectronics Discovery, a research consortium led by Notre Dame, has received $25 million in new funding.

The University of Notre Dame is a private, Catholic university with a doctoral research extensive Carnegie classification, and it is consistently ranked in USN&WR as a top-twenty national university. The South Bend area has a vibrant and diverse economy with affordable housing and excellent school systems, and is within easy driving distance of Chicago and Lake Michigan.

Screening of applications is on-going. Applicants should send (pdf format preferred) a CV, statement of teaching and research interests, and contact information for three professional references to:

facultysearch AT cse.nd.edu

<http://www.cse.nd.edu/nospam?a=facultysearch+AT+cse.nd.edu>

The University of Notre Dame is an Equal Opportunity, Affirmative Action Employer.

University of Oregon

Department of Computer and Information Science

Faculty Position

The Computer and Information Science (CIS) Department at the University of Oregon seeks applicants for one or more full-time, tenure-track faculty positions beginning fall, 2010, at the rank of Assistant Professor. The University of Oregon is an AAU research university located in Eugene, two hours south of Portland, and within one hour's drive of both the Pacific Ocean and the snow-capped Cascade Mountains.

The CIS Department is part of the College of Arts and Sciences and is housed within the Lorry Lokey Science Complex. The department offers B.S., M.S. and Ph.D. degrees. More information about the department, its programs and faculty can be found at http://www.cs.uoregon.edu, or by contacting the search committee at faculty.search@cs.uoregon.edu.

We offer a stimulating, friendly environment for collaborative research both within the department and with other departments on campus. Faculty in the department are affiliated with the Cognitive and Decision Sciences Institute, the Computational Science Institute, and the Neuro-Informatics Center.

Computer science is a rapidly evolving academic discipline. The department accordingly seeks to hire faculty in established areas as well as emerging directions in computer science. Applicants interested in interdisciplinary research are encouraged to apply. Applicants must have a Ph.D. in computer science or closely related field, a demonstrated record of excellence in research, and a strong commitment to teaching. A successful candidate will be expected to conduct a vigorous research program and to teach at both the undergraduate and graduate levels.

Applications will be accepted electronically through the department's web site (only). Application information can be found at:

http://www.cs.uoregon.edu/Employment/

Review of applications will begin January 4, 2010 and continue until the position is filled. Please address any questions to:

faculty.search@cs.uoregon.edu

The University of Oregon is an equal opportunity/affirmative action institution committed to cultural diversity and is compliant with the Americans with Disabilities Act. We are committed to creating a more inclusive and diverse institution and seek candidates with demonstrated potential to contribute positively to its diverse community.

University of Pennsylvania

Department of Computer and Information Science

Faculty Positions

The University of Pennsylvania invites applicants for tenure-track appointments in computer science to start July 1, 2010. Tenured appointments will also be considered.

The Department of Computer and Information Science seeks individuals with exceptional promise for, or a proven record of, research achievement who will excel in teaching undergraduate and graduate courses and take a position of international leadership in defining their field of study. While exceptional candidates in all areas of core computer science may apply, of particular interest this year are candidates in who are working on the foundations of Market and Social Systems Engineering - the formalization, analysis, optimization, and realization of systems that increasingly integrate engineering, computational, and economic systems and methods. Candidates should have a vision and interest in defining the research and educational frontiers of this rapidly growing field.

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

The Penn CIS Faculty is sensitive to "two–body problems" and would be pleased to assist with opportunities in the Philadelphia region.

For more detailed information regarding this position and application link please visit:

http://www.cis.upenn.edu/departmental/facultyRecruiting.shtml

University of Pennsylvania

Department of Computer and Information Science

Lecturer Position

The University of Pennsylvania invites applicants for the position of Lecturer in Computer Science to start July 1, 2010. Applicants should hold a graduate degree (preferably a Ph.D.) in Computer Science or Computer Engineering, and have a strong interest in teaching with practical application. Lecturer duties include undergraduate and graduate level courses within the Master of Computer and Information Technology program, (www.cis.upenn.edu/grad/mcit/). Of particular interest are applicants with expertise and/or interest in teaching computer hardware and architecture. The position is for one year and is renewable annually up to three years.

Successful applicants will find Penn to be a stimulating environment conducive to professional growth in both teaching and research.

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

The Penn CIS Faculty is sensitive to "two–body problems" and would be pleased to assist with opportunities in the Philadelphia region.

For more detailed information regarding this position and application link please visit:

http://www.cis.upenn.edu/departmental/facultyRecruiting.shtml

University of Prince Edward Island

Department of Computer Science & Information Technology

Post Doctoral Fellowship Opportunities

The Department of Computer Science & Information Technology invites applications from qualified Post Doctoral candidates for at least one research position involving human factors usability testing of video games and at least one research position in network support for on-line video games.

For details, please visit our website: http://www.upei.ca/csit/postdoc

University of South Carolina

Computer Science and Engineering

Department Chair

The Department of Computer Science and Engineering (www.cse.sc.edu) in the College of Engineering and Computing, University of South Carolina, seeks nominations and applications for the position of Department Chair. The Department offers bachelor's degrees in Computer Engineering, Computer Information Systems, and Computer Science, M.S., M.E. and Ph.D. degrees in Computer Science and Engineering, a Master of Software Engineering, and a Certificate of Graduate Studies in Information Assurance and Security. This is an active and engaged Department with 21 faculty members, including 20 with current research funding and 8 NSF CAREER award winners. Enrollment is over 300 undergraduate and 90 graduate students, including more than 50 doctoral students.

Applicants must have outstanding leadership and administrative skills, and credentials (including a Ph.D. in computer science, computer engineering, or related field) commensurate with appointment as a full professor with tenure. Nomination letters should include statements regarding the nominee's relevant credentials. Applicants should submit a current resume, a statement of professional interests and vision, and the names, affiliations, and contact information of professional references. Applications will be accepted until the position is filled and should be sent by email to cse-chair-search@cec.sc.edu.

The Department is particularly interested in receiving applications from minorities and women. The University of South Carolina is an affirmative action, equal opportunity employer.

University of Texas at Arlington

Computer Science and Engineering Department

Faculty Openings for 2010-2011

The University of Texas at Arlington (UT Arlington), Computer Science and Engineering (CSE) Department at Arlington (http://www.cse.uta.edu) has one tenure track faculty position to fill for the year 2010-2011. We invite applications from exceptional candidates in all areas of computer science.

CSE is committed to excellence in research and teaching with a large number of its faculty receiving NSF, NIH and other types of funding. CSE will be moving into a new $116 million building in 2011. The University of Texas at Arlington is located in a multi-ethnic and industrially advanced metropolitan area with easy access to several other universities and hospitals. Situated between the city of Dallas and the city of Fort Worth, UT Arlington sits in a telecommunications/high technology "corridor", in one of the nation's fastest growing technological regions, with DFW airport about 20 min. north of the campus.

The CSE faculty are active researchers, many with multiple grants and established research programs. Major department strengths include databases, networks, mobile and pervasive computing, computer vision, bioinformatics and biomedical computing, and artificial intelligence applications in health and other areas. The department has ongoing projects with UT Southwestern Medical Center at Dallas, University of North Texas Health Science Center in Ft. Worth, UT Arlington's Automation and Robotics Research Institute, the School of Nursing, several engineering departments in the College of Engineering and departments in the College of Science, among others.

Applicants must have an earned doctorate in computer science or computer engineering and have demonstrated a commitment to quality teaching and scholarly research. Applicants are expected to have shown an excellent record of research initiative, be committed to teaching both undergraduate and graduate courses, have high quality publications and a demonstrated ability to collaborate in teams. Interested persons should submit a letter of application, a resume, best papers, and reference letters online at:

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

For further information concerning the search, please contact the search committee chair (Phone: 817-272-3605; search@cse.uta.edu).

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

UT Arlington is an Equal Opportunity/Affirmative Action Employer.

University of Washington

Senior Faculty Position in eScience

With dedicated financial support from the state, the University of Washington has recently established an "eScience Institute". The overall objective of the Institute is to help position the University at the forefront of research both in modern computational science techniques and technologies (sensor networks, data management, data analysis, etc.) and in the fields that depend upon these techniques and technologies. We are searching for a faculty member who has made outstanding contributions to eScience methodology and has advanced the forefront in one of the application domains either through his/her own work or through collaboration with domain scientists. An ideal candidate would be qualified for a joint appointment in a "methodology department" (Applied Mathematics, Computer Science & Engineering, Mathematics, or Statistics) and in an "application department" (Astronomy, Biology, Genome Sciences, Oceanography, ...). We anticipate a hire at the tenured level rapidly providing leadership, although assuming the "Directorship" of the eScience Institute is not a necessity.

Please submit your application through the Web site:

http://escience.washington.edu/apply/

Applicants must have earned a doctorate by the date of appointment. Appointments at the Assistant Professor, Associate Professor and Professor ranks will be considered. All University of Washington faculty engage in teaching, research, and service. UW is an affirmative action, equal opportunity employer. We

Professional Opportunities

have a culturally diverse faculty and staff and strongly encourage applications from women, minorities, individuals with disabilities and covered veterans. Position contingent on budgetary approval.

University of Waterloo

David R. Cheriton School of Computer Science

Faculty Position in Software Engineering

The University of Waterloo invites applications for a tenure-track or tenured faculty position in the David R. Cheriton School of Computer Science, in the area of Software Engineering. Candidates at all levels of experience are encouraged to apply. Successful applicants who join the University of Waterloo are expected to develop and maintain a productive program of research, attract and develop highly qualified graduate students, provide a stimulating learning environment for undergraduate and graduate students, and contribute to the overall development of the School. A Ph.D. in Computer Science, or equivalent, is required, with evidence of excellence in teaching and research. Rank and salary will be commensurate with experience, and appointments are expected to commence during the 2010 calendar year.

With over 70 faculty members, the University of Waterloo's David R. Cheriton School of Computer Science is the largest in Canada. It enjoys an excellent reputation in pure and applied research and houses a diverse research program of international stature. Because of its recognized capabilities, the School attracts exceptionally well-qualified students at both undergraduate and graduate levels. In addition, the University has an enlightened intellectual property policy which vests rights in the inventor: this policy has encouraged the creation of many spin-off companies including iAnywhere Solutions Inc., Maplesoft Inc., Open Text Corp and Research in Motion. Please see our website for more information:

http://www.cs.uwaterloo.ca

To submit an application, please register at the submission site:

http://www.cs.uwaterloo.ca/faculty-recruiting

Once registered, instructions will be provided regarding how to submit your application. Applications will be considered as soon as possible after they are complete, and as long as positions are available.

The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples, and persons with disabilities. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority.

University of Waterloo

David R. Cheriton School of Computer Science

Cheriton Chairs in Software Systems

Applications are invited for one or two David R. Cheriton Chairs in Software Systems. These are senior positions and include substantial research support and teaching reduction. Candidates with outstanding research records in software systems (very broadly defined) are encouraged to apply. Successful applicants who join the University of Waterloo are expected to be leaders in research, have an active graduate student program and contribute to the overall development of the School. A Ph.D. in Computer Science, or equivalent, is required, with evidence of excellence in teaching and research. Rank and salary will be commensurate with experience, and appointments are expected to commence during the 2010 calendar year. The Chairs are tenured positions.

With over 70 faculty members, the University of Waterloo's David R. Cheriton School of Computer Science is the largest in Canada. It enjoys an excellent reputation in pure and applied research and houses a diverse research program of international stature. Because of its recognized capabilities, the School attracts exceptionally well-qualified students at both undergraduate and graduate levels. In addition, the University has an enlightened intellectual property policy which vests rights in the inventor: this policy has encouraged the creation of many spin-off companies including iAnywhere Solutions Inc., Maplesoft Inc., Open Text Corp and Research in Motion. Please see our website for more information:

http://www.cs.uwaterloo.ca

To submit an application, please register at the submission site:

http://www.cs.uwaterloo.ca/faculty-recruiting

Once registered, instructions will be provided regarding how to submit your application. Applications will be considered as soon as possible after they are complete, and as long as positions are available.

The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples, and persons with disabilities. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority.

University of Waterloo

David R. Cheriton School of Computer Science

Faculty Positions in Health Informatics

The University of Waterloo invites applications for one or two tenure-track or tenured faculty positions in the David R. Cheriton School of Computer Science, in the area of Health Informatics. We define health informatics broadly to include medical informatics and biomedical systems. The School plans to start a new graduate degree program in health informatics in September 2010.

Candidates at all levels of experience are encouraged to apply. Successful applicants who join the University of Waterloo are expected to develop and maintain a productive program of research, attract and develop highly qualified graduate students, provide a stimulating learning environment for undergraduate and graduate students, and contribute to the overall development of the School. A Ph.D. in Computer Science, or equivalent, is required, with evidence of excellence in teaching and research. Rank and salary will be commensurate with experience, and appointments are expected to commence during the 2010 calendar year.

With over 70 faculty members, the University of Waterloo's David R. Cheriton School of Computer Science is the largest in Canada. It enjoys an excellent reputation in pure and applied research and houses a diverse research program of international stature. Because of its recognized capabilities, the School attracts exceptionally well-qualified students at both undergraduate and graduate levels. In addition, the University has an enlightened intellectual property policy which vests rights in the inventor: this policy has encouraged the creation of many spin-off companies including iAnywhere Solutions Inc., Maplesoft Inc., Open Text Corp and Research in Motion. Please see our website for more information:

http://www.cs.uwaterloo.ca

To submit an application, please register at the submission site:

http://www.cs.uwaterloo.ca/faculty-recruiting

Once registered, instructions will be provided regarding how to submit your application. Applications will be considered as soon as possible after they are complete, and as long as positions are available.

The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples, and persons with disabilities. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority.

Virginia Tech

Department of Computer Science

Senior Position, Artificial Intelligence/ Machine Learning

The Department of Computer Science at Virginia Tech (www.cs.vt.edu) invites applications for a full-time tenured position at the Professor or Associate Professor rank from candidates in artificial intelligence with particular interests in machine learning, knowledge representation, or data mining. Candidates should have an established record of scholarship, leadership, and collaboration in computing and interdisciplinary areas; demonstrated ability to contribute to teaching at the undergraduate and graduate levels in AI and related subjects; sensitivity to issues of diversity in the campus community; and the skills needed to establish and grow a multidisciplinary research group.

CS@VT has over 40 tenure-track research-oriented faculty. PhD production is among the top 30 in the US and annual research expenditures exceed $6 million. There are rich opportunities in a highly collaborative department with strengths in HCI, HPC, CS education, digital libraries, computational biology and bioinformatics. Active interdisciplinary research also explores CyberArts, digital government, problem-solving environments. Emphases on security and personal health informatics are underway in collaboration with the newly formed VT-Carilion Research Institute associated with the VT-Carilion School of Medicine, opening in Fall 2010.

CS@VT is part of the College of Engineering (www.eng.vt.edu) in a comprehensive research university with more than 26,000 students. The main campus is in Blacksburg, which is consistently ranked among the country's best places to live (http://www.vt.edu/where_we_are/blacksburg/).

Salary for suitably qualified applicants is competitive and commensurate with experience. Virginia Tech is an Equal Opportunity/Affirmative Action Institution.

Applications must be submitted online to https://jobs.vt.edu for posting #090529. Applicant screening will begin January 15, 2010 and continue until the position is filled. Inquiries should be directed to Dennis Kafura, Hiring Committee Chair, kafura@cs.vt.edu.

Washington University in Saint Louis

Department of Computer Science and Engineering

Multiple Tenure-Track/Tenured Faculty Positions

The Department of Computer Science and Engineering (CSE) and the School of Medicine (WUSM) are jointly searching for multiple tenure-track faculty members with outstanding records of computing research and a serious interest in collaborative research on problems related to biology and/or medicine. Appointments may be made wholly within CSE or jointly with the Departments of Medicine or Pathology & Immunology.

Professional Opportunities Continued on Page 16

UNIVERSITY of WASHINGTON | BOTHELL
COMPUTING & SOFTWARE SYSTEMS

Assistant Professor
Software Engineering

The Computing and Software Systems Program at the University of Washington Bothell (UW Bothell) invites applications for a tenure track Assistant Professor position with expertise in Software Engineering to begin Fall 2010. All University faculty engage in teaching, research, and service. Areas of research and teaching interest include, but are not limited to: Requirements Engineering, Quality Assurance, Testing Methodologies, Software Development Processes, Software Design Methodologies, Software Project Management, and Collaborative and Team Development.

The Bothell campus of the University of Washington was founded in 1990 as an innovative, interdisciplinary campus within the University of Washington system - one of the premier institutions of higher education in the US. Faculty members have full access to the resources of a major research university, with the culture and close relationships with students of a small liberal arts college.

Required qualifications for the position include an earned doctorate in computer science, software engineering, or another relevant technical field, along with a body of scholarship, or demonstrated promise for future work, that warrants UW Bothell appointment at the rank of Assistant Professor, and demonstrated commitment to excellence in undergraduate and graduate education.

To apply, please send a cover letter, curriculum vitae, a list of at least three professional references including contact information, a statement of teaching philosophy, evidence of teaching effectiveness, and a research plan to **css-search@uwb.edu**. Review of applications will begin on November 15, 2009; the position will remain open until filled.

For additional information, please see our website at **http://www.uwb.edu/css/faculty_positions.xhtml**.

The University of Washington, Bothell is an affirmative action, equal opportunity employer.

Professional Opportunities

A key initiative in the CSE Department's strategic plan is Integrating Computing and Science. As part of that initiative, we expect to make synergistic hires with a combined research portfolio spanning the range from fundamental computer science/engineering to applied research focused on science or medicine. Specific areas of interest include, but are not limited to:

- Analysis of complex genetic, genomic, proteomic, and metabolomic datasets;
- Theory/Algorithms with the potential for biomedical applications;
- Image analysis or visualization with the potential for biomedical applications;
- Databases, medical informatics, clinical or public-health informatics;
- Computer engineering with applications to medicine or the natural sciences;
- All areas of computational biology and biomedical informatics

These positions will continue a successful, ongoing strategy of collaborative research between CSE and the School of Medicine, which is consistently ranked among the top 3 medical schools in the United States. CSE currently consists of 24 tenured and tenure-track faculty members, 71 Ph.D. students, and a stellar group of undergraduates with a history of significant research contributions. The Department seeks to build on and complement its strengths in biological sequence analysis, biomedical image analysis, and biomedical applications of novel computing architectures. Exceptional candidates conducting research in other areas of Computer Science are also encouraged to apply.

Washington University is a private university with roughly 6,000 full-time undergraduates and 6,000 graduate students. It has one of the most attractive university campuses anywhere, and is located in a lovely residential neighborhood, adjacent to one of the nation's largest urban parks, in the heart of a vibrant metropolitan area. St. Louis is a wonderful place to live, providing access to a wealth of cultural and entertainment opportunities without the everyday hassles of the largest cities.

We anticipate appointments at the rank of Assistant Professor; however, in the case of exceptionally qualified candidates appointments at any rank may be considered. Applicants must have a Ph.D. in computer science, computer engineering, electrical engineering, biomedical engineering, or a closely related field and a record of excellence in teaching and research appropriate to the appointment level. The selected candidate is expected to build an externally-supported research program, teach and mentor students at the graduate and undergraduate levels, and foster interdisciplinary interactions with colleagues throughout the university. Candidates who would contribute to enhancing diversity at the departmental and university levels are strongly encouraged to apply. Applications from academic couples are welcomed and encouraged.

Qualified applicants should submit a complete application (cover letter, curriculum vitae, research statement, teaching statement, and names of at least three references) electronically by following the directions provided at:

http://cse.wustl.edu/faculty-recruiting/

Other communications may be directed to:

Prof. Michael Brent
Department of Computer Science
and Engineering
Campus Box 1045
Washington University
One Brookings Drive
St. Louis, MO 63130-4899

Applications submitted before January 31, 2010 will receive full consideration. Washington University is an equal opportunity/affirmative action institution and encourages applications from women and minority candidates.

Wellesley College

Computer Science Department

Norma Wilentz Hess Visiting Assistant Professor

Wellesley College invites applications for a two-year Norma Wilentz Hess Fellowship in the Department of Computer Science. Funded at the Visiting Assistant Professor level, this fellowship will help Wellesley maintain a flexible Computer Science curriculum that explores interdisciplinary learning and new directions of special promise. With a teaching load of one course per semester, the Hess Fellow will have ample opportunity for innovative course development and collaborative teaching and research projects with Wellesley faculty and students. The fellowship also includes support for travel, research, equipment, conference attendance, and other academic activities. For more information about the department and the college, please visit http://cs.wellesley.edu.

Applicants should have a Ph.D (or be close to completion) in Computer Science or a related discipline. Strong candidates in any area of specialty will be considered. We especially encourage applicants in interdisciplinary fields such as artificial intelligence, bioinformatics, human/computer interaction, and ethical, educational, social, and legal aspects of computing.

Interested applicants are requested to submit a letter of application, curriculum vitae, and names and email addresses of three references through our on-line application system at https://career.wellesley.edu. Include a statement discussing teaching philosophy and ideas for course development and research projects. Applications will be reviewed starting January 11, 2010. If circumstances make it impossible to submit any materials electronically, you may email working@wellesley.edu for assistance. Questions concerning the position should be directed by email to Randy Shull at rshull@wellesley.edu.

Wellesley College is an Affirmative Action/Equal Opportunity Employer, and we are committed to increasing the diversity of the college community and the curriculum. Candidates who believe they can contribute to that goal are encouraged to apply.

Yale University and Franklin & Marshall College

Computer Science Department

Postdoctoral Researcher

We are soliciting applications for a 2-3 year postdoctoral researcher position, starting as early as possible, to work with Bryan Ford at Yale University and Janardhan Iyengar at Franklin and Marshall (F&M) College, developing and implementing a next-generation transport services architecture for the Internet. The project addresses persistent challenges to Internet evolution by modularizing and refactoring transport functions and reconsidering their relationship to the network layer. The postdoc will spend the first year at F&M and the remaining 1-2 years at Yale. The position offers unique exposure to the contrasting settings of both a small but selective liberal-arts college with a budding CS department and a major research university. Applicants should have a PhD (ABD considered) in Computer Science, and should have a strong background in systems/networking research.

For more details: http://bford.info/tng/postdoc.html

Please send CVs and inquiries to <bryan.ford@yale.edu> and <jiyengar@fandm.edu

CRA-W Anita Borg Early Career Award

Nomination Deadline

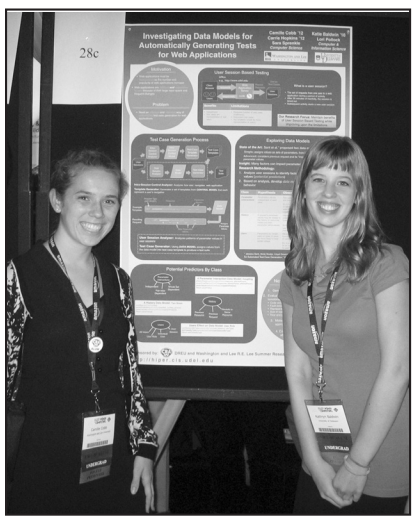
February 15, 2010

Details: craw_awards@cra.org

Hopper Conference

Kateryna Kuksenok, Oberlin College, a DREU student, with Tessa Lau, IBM (CRA-W board member) at the Hopper Poster Session.

Esin Saka, University of Louisville, a grad cohort participant and student speaker, displays an impressive badge at the Hopper Conference.



Camille Cobb, Washington and Lee University, and Kathryn Baldwin, University of Delaware (DREU participants) pictured at the Hopper Poster Session.

On the right is Joann Ordille, Avaya Labs, a CRA-W board member who organized the Career Mentoring Workshop at the Hopper Conference, with Yvonne Coady, University of Victoria, a speaker for the Graduate School Survival Skills session at the Career Mentoring Workshop.

DREU: Distributed Research Experiences for Undergraduates

(Known as the DMP, Distributed Mentor Project, from 1994-2008)

Application Deadline for Summer 2010

February 15, 2010

Details:

http://www.cra.org/Activities/craw/dmp/index.php

CRA-W/CDC Distinguished Lecture Series

Applications Solicited for 2010-2011
University Sites Needed
See: http://cra-w.org/dls