Wing and Lickel Recognized for Service

The CRA Board of Directors has selected Jeanette M. Wing, President of the Professor of Computer Science and Head, Computer Science Department, Carnegie Mellon University, to receive its 2011 Distinguished Service Award. The award will be presented to Professor Wing at the ACM Awards Luncheon in San Jose on June 4.

CRA makes this award, usually annually, to someone who has made an outstanding service contribution to the computing research community. This award recognizes service in the areas of government affairs, professional societies, publications or conferences, and leadership that has a major impact on computing research.

Professor Wing was nominated for the award for her national and international thought leadership with respect to Computational Thinking, and for her extraordinary performance as NSF Assistant Director for CISE from 2007-10. Articulating the notion of Computational Thinking has been influential in identifying how computing research is indeed far beyond researchers and other sciences, for example—considering higher order computational notions such as abstraction, exponentials, and more. Wing’s leadership at NSF came at a crucial time both scientifically and politically. She has been deeply involved in a set of major NSF programs including Cyber-Enabled Discovery and Innovation, Expeditions in Computing, Trustworthy Computing, Data-Intensive Computing, and more. These have helped push research in numerous new directions, and they have been essential in further establishing computing research as a cornerstone of NSF’s full research portfolio and as a critical dimension of America’s innovation economy. In the words of Peter Lee, Managing Director of Microsoft Research Redmond, "Simply, Jeanette’s service work has touched, in a tangible and positive way, virtually every working academic computer science researcher per se. That is, the way key problems—in biology and other sciences, for example—are considered is deeply transformed, but these are computational notions such as abstraction, exponentials, and more."

New CS Science Policy Workshop Seeks Nominations

As part of its mission to develop a next generation of leaders in the computing research community, CRA’s Computing Community Consortium (CCC) announces the CCC Leadership in Science Policy Institute (LiSPI), intended to educate a small cadre of computing researchers on how science policy in the U.S. is formulated and how our government works. We seek nominations for participants.

LiSPI will be centered around a one-day workshop to be held on Monday, November 7, 2011 in Washington, DC. Attendees will be expected to attend.

LiSPI will feature presentations and discussions with science policy experts, current and former Hill staff, and relevant agency and Administration personnel about the mechanics of the legislative process, interacting with agencies, advisory committees, and the federal case for computing. (A list of sessions and speakers is available at: http://www.cra.org/ccc/spi)

LiSPI participants are expected to:

• complete a short lesson describing the basic structure and function of the Congress (a sort of “Civil 101” assignment) prior to attending the workshop, so that time spent at the workshop can focus on more advanced content;
• attend the November 7 workshop, which includes breakouts and lunch as well as a reception with the speakers and invited guests at the conclusion of the day; and
• complete a small-group assignment afterwards that puts to use the workshop content on a CCC-inspired problem—perhaps writing an argument in favor of a particular initiative for an agency audience, or drafting sample testimony on a CCC topic.

LiSPI is not intended for individuals who wish to undertake research on science policy, become science policy fellows, or take permanent positions in Washington, DC. Rather, we are trying to reach workaday academics who appreciate that our field must be engaged in helping government.

The CCC will provide funds for hotel accommodations for two nights (before and after the workshop), meals, as well as airfare and other travel expenses in connection with attending the November 7 workshop.

Eligibility and Nomination Process

LiSPI participants are expected to be tenured academics from Computer Science and Information Science departments who are adept at communicating. They must be nominated by their chair or department head and must have demonstrated an interest in science policy, especially as it relates to computer science (and closely allied fields).

As a Parkering of the Computing Research Association

May 2011 Vol. 23/No. 3
A CIFellow’s Perspective: “Becoming a Better Researcher”

By Susan P. Wyche

During my presentation at the CIFellows Research Meeting & Career Mentoring Workshop in December, Microsoft’s Peter Lee shared his motivations for creating the program. Beyond giving recent PhDs an opportunity to remain in academia during a time when obtaining an academic job is more difficult than usual, he saw the program as a way to “create a cadre of highly independent computing researchers.”

I am currently a first-year CIFellow in Virginia Tech’s Computer Science Department, and I describe how this program is helping me to achieve what Peter intended—to be an “independent computing researcher.”

I conduct research in Human-Computer Interaction (HCI), a subfield in computer science that broadly focuses on studying, planning, and designing interactions between people and computers. My current research addresses two frequently cited problems in HCI: 1) how to integrate design thinking into computer science, and 2) how to identify and break out of the Western values embedded in technology design.

To address these problems I am first conducting human-centered research examining how technology supports communication, economic exchange and connectedness between African immigrants in the U.S. and their families, friends and co-workers living in sub-Saharan Africa. Based on this research, and in collaboration with design and computer science students, I then will build technology interventions grounded in my empirical findings.

Virginia Tech is an ideal place to carry out this project because there is an established HCI program in the university’s computer science department, a strong industrial design program, faculty whose interests mesh with mine, and a campus environment that values and supports interdisciplinary collaboration. The CIFellows Project gives me freedom to take advantage of what Virginia Tech has to offer, carry out my own research, and engage in other activities that will make me more competitive when the time comes to seek permanent employment. For example, I have always felt comfortable pursuing my own research—but I am fortunate that this fellowship also provides formal experience in a less-structured, more informal setting.

At six-week deployment study in Kenya. The generous financial resources that accompany the fellowship also make changing research topics possible. I’ve used these resources to compensate study participants, travel, purchase materials to develop prototypes, and fund an upcoming six-week deployment study in Kenya. In contrast to a more conventional postdoc I am not beholden to an advisor and I have taken advantage of this to work independently. In turn, this has given me the confidence necessary to continue to develop my own research agenda.

In addition to teaching and pursuing new research directions, I have the opportunity to engage in other activities that will help me reach my longer-term goal of becoming an assistant professor at a research university. These activities include mentoring students, giving talks, serving on committees, and figuring out how to balance the various demands on my time. I feel incredibly fortunate to have two years, with no tenure clock ticking, to begin figuring these things out. Like anyone transitioning from being a graduate student to something else, there are challenges. For example, I am working in a new institution with new ways and old histories that I don’t understand. I am figuring out how to collaborate with individuals with different working styles than my own. I miss living in a major metropolitan area and wonder if I could stay in a small college town for a longer period of time. Again, these are challenges many people face after completing a PhD and transitioning to a new position. At the end of the day, being a CIFellow means I don’t have to devote time and energy worrying about things I cannot control; instead it allows me to entirely focus on what I can control; that is, becoming a better researcher.

Susan P. Wyche received her Ph.D. in Human-Centered Computing from the Georgia Institute of Technology in 2009 under the direction of Dr. Rebecca E. Grinstein. She is now a CIFellow at Virginia Tech where she works with Prof. Steve Harrison. Susan is part of the 2010 cohort of CIFellows.

Discipline-Specific Mentoring Workshops

Call for Proposals due June 15, 2011

CRA-W and CDC are jointly soliciting proposals for discipline-specific mentoring workshops within computing sub-fields. The goal of these workshops is to increase the participation of members of underrepresented groups within a specific research area by providing career-mentoring advice and discipline-specific overviews of past accomplishments and future research directions.

www.cra-w.org/discipline

Notes:

1 http://www.cra.org/resources/crs-onlineview/cifellows_descend_on_washington/

For more details about the CIFellows Project, visit http://cifellows.org/
CRA Election Results

CRA recently elected five new members to its Board of Directors. They will begin three-year terms on July 1, 2011.

Mary Czerwinski is the Research Area Manager, Visualization and Interaction for Business and Entertainment (VIBE) at Microsoft Research. In 2009, she was honored by ACM with its Distinguished Scientist Award, SIGCIC Lifetime Service Award, and SIGCIC CHI Academy. She has participated in CRA/AAW events and served as an invited lecturer, presenter, and panelist at the Grace Hopper Conference. Her research interests include: group awareness, communication and collaboration, personal information management, multitasking and task switching, information visualization, spatial cognition, and ubiquitous computing. Dr. Czerwinski received a Ph.D. in Cognitive Psychology from Indiana University, Bloomington, and brings a unique perspective to the board.

Susan B. Davidson is the Weiss Professor and Chair of the Department of Computer and Information Science at the University of Pennsylvania. An ACM Fellow since 2001, she received the ACM Service Award for performance as General Chair (1998 and 2003) and IBM’s Outstanding Innovation Award in 1996. Hallpere has served as Chair, SIGPLAN (1993-95); Chair, ACM/COMPASS Conference 1999 and OOPSLA Steering Committee (1999-2002); Co-Chair, ACM History of Programming Languages Conference (HOPL-III, 2007); Secretary, ACM (1997-98); and Associate Editor, ACM TOPLAS (2001-07). Her research interests include programming languages and software engineering, object-oriented systems, concurrent systems, program verification, and governance of software development. Dr. Hallpere earned a Ph.D. in Computer Science from Stanford University.

Brent T. Hailpern is the Director of Programming Models and Tools at the IBM Thomas J. Watson Research Center. He is an ACM Fellow (2001) and an IEEE Fellow (1995). He received SIGPLAN’s Distinguished Shneiderman Award in 1998 and IBM’s Outstanding Innovation Award in 1996. Hallpere has served as Chair, SIGPLAN (1993-95); Chair, ACM/COMPASS Conference 1999 and OOPSLA Steering Committee (1999-2002); Co-Chair, ACM History of Programming Languages Conference (HOPL-III, 2007); Secretary, ACM (1997-98); and Associate Editor, ACM TOPLAS (2001-07). His research interests include programming languages and software engineering, object-oriented systems, concurrent systems, program verification, and governance of software development. Dr. Hallpere earned a Ph.D. in Computer Science from Stanford University.

Jeanette M. Wing is Professor of Computer Science and Head of the CS Department at Carnegie Mellon University. From 2007 to 2010 she was Assistant Director, Computer and Information Science and Engineering, at the National Science Foundation; and Co-Chair, Networking and Information Technology Research and Development (NITRD). Professor Wing is a Fellow of the American Academy of Arts and Sciences (2010); Fellow of the American Association for the Advancement of Science (2007); Fellow of the Association for Computing Machinery (ACM, 1998); and Fellow of the Institute of Electrical and Electronic Engineers (IEEE, 2003). Her research interests include: trustworthy computing, privacy, security, software specification and verification, and concurrent systems, programming languages, programming methodology, and software engineering. Professor Wing received a PhD in Computer Science from MIT.

Ellen W. Zegura, Professor and Founding Chair of the CS Department at Georgia Tech, is an IEEE Fellow (2010). Her research interests include: computer networking, Internet and mobile wireless; and humanistic computing. She was a Member of the Interim Computing Community Consortium (CCCC) that provided guidance to the GENI Planning Committee (2000), and Co-chair and then Chair of the Network Science and Engineering (NetSE) Research Council under the auspices of the CCC (2007-09). Zegura served as a Member of the NSF CSIE Advisory Board (2005-09). Academic leadership positions included Interim Dean and Associate Dean during creation of the Threads undergraduate curriculum. She has served on CRA-W’s DMP selection and matching committee. Professor Zegura earned a Ph.D. in Computer Science from the Washington University in St. Louis. Four current board members, James Kurose (University of Massachusetts at Amherst), David Notkin (University of Washington), Valerie Taylor (Texas A&M University), and Jo Sloot Moore (University of Texas at Austin) were reelected to three-year terms effective July 1, 2011.

The terms of five members will end June 30, 2011. Rich DeMillo (Georgia Tech) served two terms and was active in the formation of CRA-E, chairing the committee in 2009-11. Two industry/lab members, Phil Bernstein (Microsoft) and Dick Waters (MEI), both of whom were term-limited, played significant roles during their tenure: Phil in his stellar service as CRA Treasurer from 2003-11 and Co-Chair of Snowbird 2002; and Dick in his ongoing role as Chair of the Outstanding Undergraduate Researcher Awards committee, appointed member of the Executive Committee 2005-07, and Co-Chair of Snowbird 2004. Ran Libeskind-Hadas (Harvey Mudd) focused on research experiences for undergraduates during his three-year appointed term on the board. Sebastian Thrun (Stanford) also will complete a one-year appointment as a board member. We acknowledge with thanks the contributions of all to CRA.

In officer elections this year, the board reelected three of the current slate of officers for additional two-year terms (2011-13): Chair, Eric Crimsson (MIT); Vice Chair, Laura Haas (IBM Almaden); and Secretary, Martha Pollack (University of Michigan). The board also elected Ronald Brachman (Yahoo) as CRA’s new Treasurer for a two-year term effective July 1.

CRA-W and CDC Launch New “Data Buddies” Project to Measure Student Outcomes

The Computing Research Association Committee on the Status of Women (CRA-W) and the Coalition to Diversify Computing (CDC) are partnering to launch a new national “Data Buddies” project. The project is supported by the National Science Foundation (NSF) through a Broadening Participation in Computing (BPC) grant and will be conducted by the CRA.

The project will survey students from more than 40 randomly selected departments across the nation, including Bachelor’s, Master’s, and Ph.D. degree-granting programs. The goal is to develop better understanding the percentage of undergraduates that go on to graduate school, the job search experiences of students who complete the Ph.D., and the employer mentoring that students received.

The results will serve two purposes: 1) provide comparison data for evaluation of RFC efforts, and 2) inform the computing community about student experiences in identifying what helps and hinders them on the path to research careers. The project is directed by Joanne Cohoon (University of Virginia) and Betsy Birot (CRA), with participation from Pia Manuel Perez-Quinones, Carla Bradley, and Kathleen Fisher.

The Data Buddies project team will survey graduating Bachelor’s, Master’s, and Ph.D. students from participating departments this spring. In the fall, all students and faculty from participating Data Buddy departments will be surveyed. Funding permitting, the program will continue for five years.

For more information on the data buddies project, please visit: https://www.cra.org/databuddies or contact Betsy Birot (birot@cra.org).

Undergraduate Researcher Award Presented

Patrick Wendell, a senior in computer science at Princeton, received CRA’s Outstanding Undergraduate Researcher award at the NSDI ’11 in Boston on March 10. Presenting the award is the symposium program cochair, David G. Andersen, Carnegie Mellon University.
Computing Community Consortium

By Erwin P. Gianchandani and Hank Korth

As part of its mission to identify major new research opportunities in the field, the Computing Community Consortium (CCC) has sponsored three “Challenges and Visions Sessions” at computing research conferences in the past year, seeking to give time and attention to “wacky ideas” that may not otherwise make it through a conference’s normal reviewing process. To incentivize submissions to these sessions, the CCC has offered travel awards to the top three papers/presentations, as judged by program committees or participants, and has publicized the winners through the CCC Blog.

Thus far, these sessions—run on an experimental basis to assess their value to the conferences as well as the broader research community—have been quite successful in elevating promising visions and generating vigorous discussions. Consequently, in the past month, the CCC has announced a call for additional Challenges and Visions Sessions (see shaded box).

For more information—including guidelines for conference program committees, recommendations for selecting winners, and logistics for issuing CCC-sponsored travel awards to the winners, as well as a sample Call for Papers for a Challenges and Vision Session—visit http://cra.org/ccc/vct.php.

We encourage you to apply! Requests need only include a brief description of the conference and a proposed list of program committee members for the track, and they may be directed to erwin@cra.org.

In the meantime, check out the three sessions below that have already been held, and be sure to contact the CCC if you would like to run a session at an upcoming conference or workshop you are organizing.


Dr. Erwin Gianchandani (erwin@cra.org) is the Director of the Computing Community Consortium (CCC) and the Computing Innovation Fellows Project.

Dr. Hank Korth is a member of the CCC Council and Wieseman Professor in the Department of Computer Science and Engineering at Lehigh University.

CCC Calling for Challenges and Visions Sessions

The Computing Community Consortium (CCC) is sponsoring an initiative to bring special “Challenges and Visions” tracks to leading computer science research conferences. The goal of this initiative is to help conferences reach out beyond the usual research papers that present completed work and to seek out papers that present ideas and visions that can stimulate the research community to pursue new directions.

Conferences may request CCC sponsorship of such tracks along with a CCC grant that provides for prize money for the top 3 papers (first prize $1000, second prize $750, and third prize: $500, to be awarded as travel grants).

Papers in a “Challenges and Visions” track should be open-ended, possibly “outrageous” or “wacky,” and present new problems, new application domains, or new methodologies that are likely to stimulate significant new research. The CCC is seeking papers (up to 4 pages in length) so that the ideas can be referenced after the conference is over.

After the conference, the CCC will post links to the track papers on its Challenges and Visions web page (see http://cra.org/ccc/vctlist.php) and help disseminate these ideas broadly in the computer science research community.

Requests for CCC sponsorship should include information on the conference and a proposed list of program committee members for the track.

Gulustan Dogan, a student at the City University of New York, discusses her poster at CRA-W’s Grad Cohort Workshop in Boston.

Mary Fernández, AT&T Research, CRA board member, and workshop speaker discusses her talk at Grad Cohort with a student.

Some key people in the Grad Cohort Workshop—from left to right: Carla Romero, CRA Director of Programs; Kathleen Fisher, CRA-W co-chair and workshop speaker; Ando Uzun, workshop speaker; and the workshop co-chairs Lori Pollock, University of Delaware, and Lori Clarke, UMass at Amherst.

Members of the “Information Retrieval” discussion table at lunch at Grad Cohort.
Teaching the Parallel Future: Finding Promise in a Sea of Cores

By Daniel Ernst, EAPF

The recent National Academies report, "The Future of Computing Performance: Game Over or Next Level?" lays out several broad landscape changes computing researchers must address to sustain growth in system performance. Indeed, we hear about little else in the parade of articles, op-eds, and conference sessions these days. Opinions vary from "We solved this 30 years ago" to "It will all blow over" to "The sky is falling." For the computing community at large, this is clearly a significant challenge.

For computer science educators, it’s even less clear how to find a way to convey the breadth and depth of this transformation to students at a time when there is enormous churn in the software and hardware solutions being proposed, adopted, and discarded. Indeed, as the NAS report emphasizes, it is critical to the field that students gain skills in reasoning about parallelism and data locality, even as undergraduates. By the time they graduate, current students will already be faced with platforms, even those in the embedded space, that build almost exclusively upon multi- and many-core architectures.

As at far back as the mid-80s, during the peak of big-iron supercomputing and the beginning of the client era, groups of educators contemplated how to convert the undergraduate CS curriculum to include parallel approaches. However, looking at the working papers produced by the Forum on Parallel Computing Curricula in 1989, for example, you see that many of the issues they discuss are the same ones that still vex us today. How deeply do we integrate parallelism into the CS curriculum? Do we separate courses or integrate material into existing course structures? Do we fundamentally change the structure and presentation of all material to reflect a parallel perspective? How do we prepare the general faculty to teach this material?

Despite all the effort put forth at that time and since, it is not surprising that we still don’t have broad community agreement on approaches or definitive guidance from a curriculum standards group on whether and how to incorporate parallelism in the CS curriculum. Since the mid-90s, the tremendous explosion of computing applications, particularly those feeding off the growth of the Internet, meant that any spare space in the curriculum was devoted to client-server architectures, Java/RMI, or web application programming. These pushed parallelism, not completely unjustly, to the sidelines.

The existing aggregation of curricula, teaching experience, programming languages, and legacy code has a significant amount of momentum that will not easily be displaced by new models. However, computing has seen and weathered many large changes before. As recently as the late 90s, educators were still working through the best methods of dealing with object-oriented abstractions that were developed in the 70s and 80s. None of our programming seachanges have happened overnight. Similarly, in the transition to parallel programming models, there remains a lot of groundwork to be done—convincing faculty, finding the best teaching methods, and developing tools and abstractions that make the concepts more accessible to students. However, unlike these past changes, our field is already several years behind a fast-moving hardware curve that is driving the change.

It is in shortening this curricular transition that our research infrastructure can play a critical role. By an investment in expediting the transfer of newly developed architectures, tools, and programming models into the classroom, computer science students will gain a more mature perspective on parallel computing—one that otherwise will likely be informed only by the messy infrastructure of the past.

In particular, these efforts need to reach down to levels that are accessible by our students at the earliest stages of their training so we don’t have to restrain them from rigid sequential thinking. The good news is that our students are always excited about trying new things, and they have no preconceived biases or fears surrounding the difficulty of parallel programming. In fact, we often overlook the fact that new students come to us with significant aptitude for reasoning about parallelism and concurrent systems.

At SIGCSE 2010, Kim Bruce reported on more than a decade’s worth of experiences introducing concurrent event-driven designs in introductory programming courses. His conclusion was that students naturally think in very non-sequential terms, eschew the carefully scaffolded exposure of first-year students to these topics isn’t overreaching. Future scaffolding could come in the form of tools, libraries, or simple deterministic abstractions, which also serve to make this material more accessible to current faculty who may want to reach parallel topics, but lack the necessary background.

New frameworks in this space are starting to appear. The MapReduce model, for example, has been adapted for use in pilot courses as early as CS1 across a range of universities. With properly constructed tools, such as St. Olaf’s WebMapReduce, students can gain direct, practiced exposure to “thinking in parallel” without the need for dealing with the details of the underlying system stack.

Researchers also stand to gain directly from partnerships with educators on at least two fronts. First, those working on simple and powerful programming interfaces to parallel systems could gain a lot of usability and performance data from observing how novice programmers use their infrastructure, as well as evaluating the programs they create for performance and correctness. Second, as industrial marketing has demonstrated many times, getting college students to use a tool is an excellent way to develop future demand—something that is necessary for reaching the critical mass of users needed to gain widespread adoption.

Among the groups supporting this interaction is the Educational Alliance for a Parallel Future (EAPF - http://www.eapf.org), a collection of individuals from academia, industry, and government research who are concerned with how we as a community navigate this transition to a more parallel future for the CS curriculum. Our efforts in this space span a range of approaches, from raising awareness among educators to providing infrastructure for teaching to encouraging the development of course materials. Most relevant to researchers may be our efforts in finding high-impact ways to “scale out” novel materials and practices that have been shown to be effective. If you are interested in working on this issue, we encourage you to get in touch with those of us involved with EAPF, or with one of the other groups engaging in the various facets of this issue.

As our field tackles these significant research challenges, we encourage everyone to keep in mind the impact these changes are having on our curriculum.

Daniel Ernst is an Assistant Professor of Computer Science at the University of Wisconsin-Eau Claire (ernst@uwec.edu), and a founding member of the Educational Alliance for a Parallel Future (EAPF).

CRA-W Twenty-Year Celebration at FCRC

CRA-W will celebrate its twentieth anniversary at FCRC on Sunday, June 5 at 7pm, following the Turing Award Lecture. The goals of the celebration are to recognize the successes of CRA-W and its programs, thank the many sponsors and friends for their support, and acknowledge the contributions of our CRA-W participants. This is also a chance to meet the many women who have participated in CRA-W programs throughout the twenty years and to hear about their achievements. The celebration will include a reception, a talk by one of the early members, and a history of CRA-W. Please visit the CRA-Web page (www.cra.org) to register for the celebration. We hope you will join us!
2009-2010 Taulbee Survey
Undergraduate CS Degree Production Rises; Doctoral Production Steady

By Stuart Zweben

The CRA Taulbee Survey\(^1\) is conducted annually by the Computing Research Association to document trends in student enrollment, degree production, employment of graduates, and faculty salaries in Ph.D.-granting departments of computer science (CS), computer engineering (CE) and information (I)\(^2\) in the United States and Canada. This article and the accompanying figures and tables present the results of the 40th annual CRA Taulbee Survey.

Information is gathered during the fall. Responses received by January 5, 2011 are included in the analysis. The period covered by the survey continues to increase since they were first included two years ago and Canadian departments (62 percent), and a typical low response rate (40 percent) from CE programs. We had a good response rate from U.S. CS departments (150 of 184, or 82 percent).\(^3\)

Departments that responded to the survey were sent preliminary results about faculty salaries in December 2010; these results included additional distributional information not contained in this report. The CRA Board views this as a benefit of participating in the survey.

While we continue to report U.S. CS departments with the (now very dated) 1995 NRC rankings, we are reviewing alternative stratification of these departments based on other factors. We are hopeful that an update to this report can be issued later in the year reflecting a new stratification methodology, and that future reports will reflect the new methodology.

We thank all respondents who completed this year’s questionnaire. Departments that participated are listed at the end of this article.

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

Total Ph.D. production in computing programs (Table 1) held steady in 2009-10, with 1,772 degrees granted compared with 1,747 last year with fewer departments reporting. Computer science degree production also was flat (1,481 vs. 1,473 last year). This follows a drop in production last year. As was pointed out last year, the economic conditions that resulted in

| Table 1. PhD Production by Type of Department and Rank |
|---------------------------------|---|---|---|---|---|---|
| Department, Rank | PhDs Produced | Avg. per Dept. | PhDs Next Year | Avg. per Dept. | Passed Qualifier | Avg. per Dept. |
| CS 1-12 | 311 | 28.3 | 298 | 26.2 | 231 | 21.0 |
| CS 13-24 | 215 | 17.9 | 241 | 20.1 | 264 | 22.0 |
| CS 25-36 | 169 | 14.1 | 205 | 17.1 | 205 | 17.1 |
| CS Other | 806 | 7.0 | 962 | 8.4 | 974 | 8.5 |
| US CS Total | 1,501 | 10.0 | 1,696 | 11.3 | 1,674 | 11.2 |
| US CE | 61 | 5.5 | 87 | 7.9 | 110 | 10.0 |
| US Information | 71 | 5.5 | 70 | 5.4 | 55 | 4.2 |
| Canadian | 139 | 7.7 | 202 | 11.2 | 188 | 10.4 |
| Total | 1,772 | 9.2 | 2,055 | 10.7 | 2,027 | 10.6 |

| Table 2. Gender of PhD Recipients by Type of Degree |
|---------------------------------|---|---|---|---|
| Gender | | CS | CE | Total |
| Male | 1,169 | 81.2% | 148 | 84.6% | 67 | 59.8% | 1,384 | 80.1% |
| Female | 271 | 18.8% | 27 | 15.4% | 45 | 40.2% | 343 | 19.9% |
| Total known Gender | 1,440 | 175 | 112 | 1,727 |
| Unknown | 41 | 2 | 2 | 45 |
| Total | 1,481 | 177 | 114 | 1,772 |

| Figure 1. Number of Respondents to the Taulbee Survey |
|---------------------------------|---|---|---|---|---|
| Year | US CS Depts. | US CE Depts. | Canadian | US Information | Total |
| 1995 | 110/133 (83%) | 9/13 (69%) | 11/16 (69%) | 130/162 (80%) |
| 1996 | 98/131 (75%) | 8/13 (62%) | 9/16 (56%) | 115/160 (72%) |
| 1997 | 111/133 (83%) | 6/13 (46%) | 13/17 (76%) | 130/163 (80%) |
| 1998 | 122/145 (84%) | 7/19 (37%) | 12/18 (67%) | 141/182 (77%) |
| 1999 | 132/156 (85%) | 5/24 (21%) | 19/23 (83%) | 156/203 (77%) |
| 2000 | 148/163 (91%) | 6/28 (21%) | 19/23 (83%) | 173/214 (81%) |
| 2001 | 142/164 (87%) | 8/28 (29%) | 23/23 (100%) | 173/215 (80%) |
| 2002 | 150/170 (88%) | 10/28 (36%) | 22/27 (82%) | 182/225 (80%) |
| 2003 | 148/167 (87%) | 6/28 (21%) | 19/27 (70%) | 173/225 (77%) |
| 2004 | 158/172 (92%) | 10/30 (33%) | 21/27 (78%) | 189/229 (83%) |
| 2005 | 156/174 (90%) | 10/31 (32%) | 22/27 (81%) | 188/232 (81%) |
| 2006 | 156/175 (89%) | 12/33 (36%) | 20/28 (71%) | 188/235 (80%) |
| 2007 | 155/176 (88%) | 10/30 (33%) | 21/28 (75%) | 186/234 (79%) |
| 2008 | 151/181 (83%) | 12/32 (38%) | 20/30 (67%) | 192/264 (73%) |
| 2009 | 147/184 (80%) | 13/31 (42%) | 16/30 (53%) | 188/265 (71%) |
| 2010 | 150/184 (82%) | 12/30 (40%) | 18/29 (62%) | 195/265 (74%) |
### Table 3. Ethnicity of PhD Recipients by Type of Degree

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Nonresident Alien</td>
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<td>45.8%</td>
<td>108</td>
<td>63.2%</td>
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<td>American Indian or Alaska Native</td>
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<td>0.0%</td>
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<td>Asian</td>
<td>169</td>
<td>12.6%</td>
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<td>13.5%</td>
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<td>Black or African-American</td>
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<td>1.3%</td>
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<td>1.2%</td>
<td>2</td>
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<tr>
<td>Native Hawaiian or Pacific Islander</td>
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<td>0.5%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
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<td>37.6%</td>
<td>35</td>
<td>20.5%</td>
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<td>5</td>
<td>0.4%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>22</td>
<td>1.6%</td>
<td>3</td>
<td>1.8%</td>
<td>3</td>
</tr>
<tr>
<td>Total have Ethnicity Data for 1,339</td>
<td></td>
<td></td>
<td>171</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td>Resident, race/ethnicity unknown</td>
<td>26</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Residency unknown</td>
<td>116</td>
<td>0</td>
<td>1</td>
<td></td>
<td>117</td>
</tr>
<tr>
<td>Total</td>
<td>1,481</td>
<td>177</td>
<td>114</td>
<td></td>
<td>1,772</td>
</tr>
</tbody>
</table>

### Table 4. Employment of New PhD Recipients By Specialty

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Tenure-track</th>
<th>Researcher</th>
<th>Postdoc</th>
<th>Teaching Faculty</th>
<th>Other Academic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>North American PhD-Granting Depts.</td>
<td>15</td>
<td>12</td>
<td>39</td>
<td>5</td>
<td>1</td>
<td>159</td>
</tr>
<tr>
<td>Tenure-track</td>
<td>12</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Researcher</td>
<td>12</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Postdoc</td>
<td>39</td>
<td>4</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Total Inside North America</td>
<td>159</td>
<td>18</td>
<td>99</td>
<td>87</td>
<td>65</td>
<td>1,326</td>
</tr>
<tr>
<td>North American, Other Academic</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Other CS/CE/I Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North American, Non-Academic</td>
<td>13</td>
<td>84</td>
<td>71</td>
<td>61</td>
<td>41</td>
<td>199</td>
</tr>
<tr>
<td>Government</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total Outside North America</td>
<td>159</td>
<td>13</td>
<td>84</td>
<td>71</td>
<td>61</td>
<td>199</td>
</tr>
<tr>
<td>Outside North America</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure-Track in PhD Granting</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Researcher in PhD</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Postdoc in PhD</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Teaching in PhD</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Other Academic</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industry</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Government</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Outside NA</td>
<td>12</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Total with Employment Data, Inside North America plus Outside North America</td>
<td>171</td>
<td>18</td>
<td>92</td>
<td>81</td>
<td>69</td>
<td>44</td>
</tr>
<tr>
<td>Employment Type &amp; Location Unknown</td>
<td>10</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>19</td>
<td>99</td>
<td>87</td>
<td>78</td>
<td>49</td>
</tr>
</tbody>
</table>
Table 5a. New PhD Students from Outside North America

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total New Outside</th>
<th>Total New</th>
<th>% Outside North America</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>187</td>
<td>0</td>
<td>0</td>
<td>187</td>
<td>389</td>
<td>48.1%</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>144</td>
<td>3</td>
<td>0</td>
<td>147</td>
<td>302</td>
<td>48.7%</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>192</td>
<td>1</td>
<td>20</td>
<td>213</td>
<td>364</td>
<td>58.5%</td>
</tr>
<tr>
<td>US CS Other</td>
<td>790</td>
<td>119</td>
<td>15</td>
<td>914</td>
<td>1,505</td>
<td>59.0%</td>
</tr>
<tr>
<td>Total US CS</td>
<td>1,313</td>
<td>87</td>
<td>35</td>
<td>1,435</td>
<td>2,560</td>
<td>56.8%</td>
</tr>
<tr>
<td>US CE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>US Information</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Canadian</td>
<td>162</td>
<td>21</td>
<td>17</td>
<td>190</td>
<td>200</td>
<td>15.4%</td>
</tr>
<tr>
<td>Total</td>
<td>2,276</td>
<td>285</td>
<td>2561</td>
<td>2,561</td>
<td>2,962</td>
<td>56.8%</td>
</tr>
</tbody>
</table>

Averages per department are computed for all reporting departments.
going to academia who took positions in departments other than Ph.D.-
granting CS/CE departments. Table 4 shows a more detailed breakdown of
the employment data for new Ph.D.s.
There continues to be a decline in
the fraction of new Ph.D.s who take
positions in industry (44.7% in 2009-
10 vs. 47.1% in 2008-09 and 56.6%
in 2007-08). A similar fraction of
graduates took academic jobs in 2009-
10 as did so in 2008-09. However,
once again many more graduates
went into academic positions as
post-doctoral employees in 2009-10,
while the fraction taking tenure-track
positions dropped from 10.4% in
2008-09 to 8.2% in 2009-10.
The unemployment rate for new
Ph.D.s remains approximately 1%.
The proportion of Ph.D. graduates
who were reported taking positions
outside of North America, among
those whose employment is known,
jumped to 11.8% in 2009-10 from
9.9% in 2008-09 and 9.2% in 2007-
08. This is a trend that bears watching.
2009-2010 Taulbee Survey

More doctoral graduates specialized in artificial intelligence, informatics: biomedical/other science, operating systems, scientific computing and social computing in 2009-10 than did so in 2008-09, while a smaller proportion specialized in databases/information retrieval (second year in a row), human-computer interaction, and high-performance computing. There have been few long-term trends in these specialization data over the years, so these year-to-year differences should not be construed as necessarily indicative of any shift in emphasis.

A smaller fraction of this year’s computer science graduates were women (18.8% vs. 20.8% last year) while a larger fraction of this year’s I school graduates were women (40.2% vs. 36.1% last year). A larger fraction of this year’s graduates were White (36.7% vs. 33.3% last year). This change was largest at I schools, where there was a 15% larger fraction of Whites and a 10% smaller fraction of Non-resident Aliens, but this may reflect differences in the specific departments reporting this year.

Table 7. PhD Program Total Enrollment by Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity Data for</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>11,548</td>
<td>1,271</td>
<td>930</td>
<td>13,749</td>
</tr>
<tr>
<td>Resident Alien</td>
<td>6,395</td>
<td>50.5%</td>
<td>866</td>
<td>62.8%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>18</td>
<td>0.1%</td>
<td>1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Asian</td>
<td>926</td>
<td>7.3%</td>
<td>97</td>
<td>7.0%</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>245</td>
<td>1.9%</td>
<td>23</td>
<td>1.7%</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>35</td>
<td>0.3%</td>
<td>1</td>
<td>0.1%</td>
</tr>
<tr>
<td>White</td>
<td>3,745</td>
<td>29.6%</td>
<td>263</td>
<td>19.1%</td>
</tr>
<tr>
<td>Multiracial, not Hispanic</td>
<td>13</td>
<td>0.1%</td>
<td>1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>171</td>
<td>1.4%</td>
<td>19</td>
<td>1.4%</td>
</tr>
<tr>
<td>Total</td>
<td>12,666</td>
<td>1,378</td>
<td>994</td>
<td>15,038</td>
</tr>
</tbody>
</table>

Table 8. PhD Program Total Enrollment by Gender

<table>
<thead>
<tr>
<th>Gender Data for</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>8,838</td>
<td>1,593</td>
<td>1,900</td>
<td>12,331</td>
</tr>
<tr>
<td>Male</td>
<td>7,622</td>
<td>86.2%</td>
<td>1427</td>
<td>89.6%</td>
</tr>
<tr>
<td>Female</td>
<td>1,216</td>
<td>13.8%</td>
<td>166</td>
<td>10.4%</td>
</tr>
<tr>
<td>Total</td>
<td>9,038</td>
<td>1,593</td>
<td>1,900</td>
<td>12,501</td>
</tr>
</tbody>
</table>

Table 9a. Gender of Bachelor’s Recipients

<table>
<thead>
<tr>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>7,622</td>
<td>86.2%</td>
<td>1427</td>
</tr>
<tr>
<td>Female</td>
<td>1,216</td>
<td>13.8%</td>
<td>166</td>
</tr>
<tr>
<td>Total</td>
<td>8,838</td>
<td>1,593</td>
<td>1,900</td>
</tr>
</tbody>
</table>

Table 9b. Race/ethnicity Data for Bachelor’s Recipients

| Resident, race/ethnicity unknown | 644  | 17 | 5 | 666 |

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

This section reports data about enrollment and degree production for Master’s and Bachelor’s programs in the doctoral-granting departments. Although the absolute number of degrees and students enrolled reported herein only reflect departments that offer the doctoral degree, the trends observed in the master’s and bachelor’s data from these departments tend to strongly reflect trends in the larger population of programs that offer such degrees.
Master's degree production in CS was flat in 2009-10 with 6,851 graduates (Table 9b-11b). Production declined in CE departments and increased in I departments, the reverse of what was experienced last year. However, these changes may reflect nothing more than changes in the programs reporting.

There were very small changes in 2009-10 in the proportion of female graduates among master's recipients. There has been little change in the gender balance among CS master's recipients for many years. A higher fraction of the I department master's recipients were Non-resident Aliens in 2009-10. In CE departments, the reverse held, with a corresponding increase in the fraction of master's graduates who were White. CS programs showed little change in ethnicity characteristics, if Non-resident Aliens and (resident) Asians are combined. We suspect that some departments incorrectly classify some Non-resident Aliens as resident Asians.

There is an increase in the number of new master's students in CS programs this year, to 5,681 from 5,440 last year (Table 13). Changes in new enrollment among CE and I programs appear consistent with changes in the number of departments in these categories that reported.

Overall bachelor's degree production in 2010 rose nearly 11 percent from that in 2009 (Tables 9a-11a). Bachelor's degree production in U.S. CS departments was up more than 9 percent. The increases in new students observed during each of the previous two years have resulted in increased degree production, a welcome turnaround from the past several years of declining bachelor's degree production.

The number of new students in U.S. CS programs continues to increase (Table 14). The number of new CS majors among U.S. computer science departments is about the same as last year, but there was a huge (50 percent) increase in the number of new pre-majors (students who are pursuing a curriculum for the major in computer science but as yet have not declared their official major). It should be noted that a relatively small number of programs have the pre-major status, and not all of them report data every year. For programs who reported non-zero numbers of pre-majors last year and this year, the increase was 22 percent. Total enrollment among majors and pre-majors in U.S. CS departments increased 10 percent (Table 10), although about one-third of these departments still report decreases in total enrollment. This is the third straight year of increases in total enrollment, and indicates that the post-dot-com declines in undergraduate computing program enrollments is over.

In Canada, the number of new CS majors increased for the third straight year, by nearly 4 percent, but the total number of CS majors declined by nearly 8 percent. Bachelor's degree production in Canada increased by more than 15 percent. These trends

### 2009-2010 Taubbee Survey

<table>
<thead>
<tr>
<th>Table 9b. Gender of Master's Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

Total have Gender

<table>
<thead>
<tr>
<th>Data for</th>
<th>6,815</th>
<th>765</th>
<th>1,926</th>
<th>9,506</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>36</td>
<td>0</td>
<td>0</td>
<td>36</td>
</tr>
</tbody>
</table>

Total | 6,851 | 765 | 1,926 | 9,542 |

### Table 10a. Ethnicity of Bachelor's Recipients

<table>
<thead>
<tr>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonresident Alien</td>
<td>584</td>
<td>8.4%</td>
<td>99</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>27</td>
<td>0.4%</td>
<td>6</td>
</tr>
<tr>
<td>Asian</td>
<td>1,034</td>
<td>14.8%</td>
<td>250</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>236</td>
<td>3.4%</td>
<td>57</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>20</td>
<td>0.3%</td>
<td>3</td>
</tr>
<tr>
<td>White</td>
<td>4,650</td>
<td>66.5%</td>
<td>901</td>
</tr>
<tr>
<td>Multiracial, not Hispanic</td>
<td>65</td>
<td>0.9%</td>
<td>13</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>373</td>
<td>5.3%</td>
<td>65</td>
</tr>
</tbody>
</table>

Total have Ethnicity Data for

| Resident, race/ethnicity unknown | 455 | 1,199 | 670 |
| Residency unknown | 1,564 | 103 | 258 | 1,925 |
| Total | 9,008 | 1,593 | 1,900 | 12,501 |

### Table 10b. Ethnicity of Master's Recipients

<table>
<thead>
<tr>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonresident Alien</td>
<td>3,585</td>
<td>59.0%</td>
<td>381</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>9</td>
<td>0.1%</td>
<td>1</td>
</tr>
<tr>
<td>Asian</td>
<td>646</td>
<td>10.6%</td>
<td>88</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>78</td>
<td>1.3%</td>
<td>10</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>14</td>
<td>0.2%</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>1,620</td>
<td>26.7%</td>
<td>164</td>
</tr>
<tr>
<td>Multiracial, not Hispanic</td>
<td>15</td>
<td>0.2%</td>
<td>0</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>110</td>
<td>1.8%</td>
<td>23</td>
</tr>
</tbody>
</table>

Total have Ethnicity Data for

| Resident, race/ethnicity unknown | 6,077 | 668 | 1,644 | 8,389 |
| Residency unknown | 267 | 89 | 184 | 540 |
| Total | 5,036 | 55.9% | 832 | 52.2% | 696 | 36.6% | 6,564 | 52.5% |

### Table 11a. Bachelor's Degree Recipients by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>1,154</td>
<td>12.8%</td>
<td>183</td>
<td>11.5%</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>760</td>
<td>8.4%</td>
<td>164</td>
<td>10.3%</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>886</td>
<td>9.8%</td>
<td>26</td>
<td>1.6%</td>
</tr>
<tr>
<td>US CS Other</td>
<td>5,036</td>
<td>55.9%</td>
<td>832</td>
<td>52.2%</td>
</tr>
<tr>
<td>Total US CS</td>
<td>7,836</td>
<td>87.0%</td>
<td>1,205</td>
<td>75.6%</td>
</tr>
<tr>
<td>US CE</td>
<td>0</td>
<td>0.0%</td>
<td>286</td>
<td>18.0%</td>
</tr>
<tr>
<td>US Information</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Canadian</td>
<td>1,172</td>
<td>13.0%</td>
<td>102</td>
<td>6.4%</td>
</tr>
<tr>
<td>Total</td>
<td>9,008</td>
<td>1,593</td>
<td>1,900</td>
<td>12,501</td>
</tr>
</tbody>
</table>
are significantly influenced by the specific departments reporting.

Because of the newness of the I-school data and the increasing number of I-schools reporting, it is not appropriate to try to discern any enrollment patterns at this time.

Computer engineering enrollment data appear comparable to those from last year in aggregate, for the second year in a row, although there are more pre-majors this year.

The fraction of women among bachelor's graduates increased this year in all three areas (CS, CE and I), though only 13.8 percent of bachelor's graduates in CS, 10.4 percent in CE, and 14.5 percent in I, were women. Ethnicity patterns were similar to last year, though this year there are somewhat fewer Whites and more Non-resident Alien graduates in both CS and I programs.

Faculty Demographics (Tables 17-23)

Table 17 shows the current and anticipated sizes for tenure-track, teaching and research faculty, and postdocs. While analyzing this year's faculty demographic data, we discovered that previous years' counts were reported incorrectly for certain of these classes. While tenure-track and total counts were accurate, the teaching, research, and postdoc numbers typically were transposed. This problem appears to have begun with the 2006-07 report, which provided actual counts for the 2007-08 academic year. So that our readers may have the correct trend data for their own information and use, we are including this year a special table, Table 17a, that shows the corrected actual figures for each academic year, beginning 2005-06.

Tenure-track faculty size rebounded this year from last year's losses. The 6.7% increase this year returns the

Table 11b. Master’s Degree Recipients by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>761</td>
<td>58</td>
<td>761</td>
<td>819</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>1,061</td>
<td>1</td>
<td>1,062</td>
<td>1,111</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>655</td>
<td>6</td>
<td>661</td>
<td>742</td>
</tr>
<tr>
<td>US CS Other</td>
<td>3,830</td>
<td>410</td>
<td>4,240</td>
<td>4,784</td>
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<tr>
<td>Total US CS</td>
<td>6,307</td>
<td>475</td>
<td>6,782</td>
<td>7,407</td>
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<tr>
<td>US CE</td>
<td>0</td>
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<td>218</td>
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<tr>
<td>US Information</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>218</td>
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<tr>
<td>Canadian</td>
<td>544</td>
<td>86</td>
<td>630</td>
<td>630</td>
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<tr>
<td>Total</td>
<td>6,851</td>
<td>765</td>
<td>1,926</td>
<td>9,542</td>
</tr>
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</table>

Table 12a. Bachelor’s Degree Candidates for 2010-2011 by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>1,188</td>
<td>270</td>
<td>1,458</td>
<td>1,458</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>924</td>
<td>182</td>
<td>1,106</td>
<td>1,106</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>680</td>
<td>28</td>
<td>708</td>
<td>948</td>
</tr>
<tr>
<td>US CS Other</td>
<td>5,001</td>
<td>934</td>
<td>6,935</td>
<td>7,711</td>
</tr>
<tr>
<td>Total US CS</td>
<td>7,793</td>
<td>1,414</td>
<td>9,207</td>
<td>10,223</td>
</tr>
<tr>
<td>US CE</td>
<td>0</td>
<td>277</td>
<td>277</td>
<td>277</td>
</tr>
<tr>
<td>US Information</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>910</td>
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<tr>
<td>Canadian</td>
<td>1,630</td>
<td>56</td>
<td>1,686</td>
<td>1,686</td>
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<tr>
<td>Total</td>
<td>9,423</td>
<td>1,747</td>
<td>11,170</td>
<td>13,126</td>
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Table 12b. Master’s Degree Candidates for 2010-2011 by Department Type and Rank

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<tr>
<th>Department, Rank</th>
<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>794</td>
<td>70</td>
<td>764</td>
<td>864</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>921</td>
<td>1</td>
<td>922</td>
<td>922</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>663</td>
<td>2</td>
<td>667</td>
<td>757</td>
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<tr>
<td>US CS Other</td>
<td>5,544</td>
<td>339</td>
<td>6,283</td>
<td>4,360</td>
</tr>
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<td>Total US CS</td>
<td>5,922</td>
<td>412</td>
<td>6,334</td>
<td>6,903</td>
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<tr>
<td>US CE</td>
<td>0</td>
<td>171</td>
<td>171</td>
<td>171</td>
</tr>
<tr>
<td>US Information</td>
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<tr>
<td>Total</td>
<td>6,361</td>
<td>586</td>
<td>6,947</td>
<td>8,484</td>
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Table 13. New Master’s Students in Fall 2010 by Department Type and Rank

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<th>CS</th>
<th>CE</th>
<th>I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>662</td>
<td>63</td>
<td>725</td>
<td>371</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>1,014</td>
<td>6</td>
<td>1,020</td>
<td>727</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>514</td>
<td>0</td>
<td>514</td>
<td>357</td>
</tr>
<tr>
<td>US CS Other</td>
<td>3,182</td>
<td>362</td>
<td>3,544</td>
<td>27</td>
</tr>
<tr>
<td>US CS Total</td>
<td>5,372</td>
<td>431</td>
<td>6,203</td>
<td>4,174</td>
</tr>
<tr>
<td>US CE</td>
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<tr>
<td>Canadian</td>
<td>509</td>
<td>21</td>
<td>530</td>
<td>284</td>
</tr>
<tr>
<td>Total</td>
<td>5,881</td>
<td>616</td>
<td>6,497</td>
<td>4,174</td>
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</table>
## Table 17. Actual and Anticipated Faculty Size by Position

<table>
<thead>
<tr>
<th>Position</th>
<th>2010-2011</th>
<th>2011-2012</th>
<th>2012-2013</th>
<th>Expected Two-Year Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure-Track</td>
<td>4,758</td>
<td>4,904</td>
<td>5,018</td>
<td>260</td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>665</td>
<td>678</td>
<td>694</td>
<td>29</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>455</td>
<td>532</td>
<td>583</td>
<td>128</td>
</tr>
<tr>
<td>Postdoc</td>
<td>675</td>
<td>742</td>
<td>807</td>
<td>132</td>
</tr>
<tr>
<td>Other/Not Listed</td>
<td>114</td>
<td>118</td>
<td>131</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>6,667</td>
<td>7,034</td>
<td>7,233</td>
<td>566</td>
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</tbody>
</table>

## Table 17a. Faculty Size by Position: 2006-2010

<table>
<thead>
<tr>
<th>Position</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure-Track</td>
<td>4,403</td>
<td>4,390</td>
<td>4,776</td>
<td>4,458</td>
<td>4,758</td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>635</td>
<td>633</td>
<td>589</td>
<td>625</td>
<td>665</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>411</td>
<td>400</td>
<td>456</td>
<td>491</td>
<td>455</td>
</tr>
<tr>
<td>Postdoc</td>
<td>316</td>
<td>353</td>
<td>423</td>
<td>512</td>
<td>675</td>
</tr>
<tr>
<td>Other/Not Listed</td>
<td>94</td>
<td>131</td>
<td>162</td>
<td>226</td>
<td>114</td>
</tr>
</tbody>
</table>

* Uses Taubbee data collected in the fall of each year, covering faculty size for the academic year that was beginning.
tenure-track level to that of two years ago. However, at U.S. CS departments the increase was only 3.1%, and some of this is due to an increased number of departments reporting this year. The use of postdocs continued to grow at an astonishing rate of 23.4% this year. Postdoc numbers have more than doubled in a four-year period. Teaching faculty numbers rose 6.4% while research faculty numbers dropped 7.3%.

The overall totals reflect a 5.6% increase. However, among U.S. CS departments the overall increase was a modest 1.3%. Large increases in CE, I, and Canadian totals were present this year (20.7%, 33.1% and 20.9%, respectively), but the specific changes in the percentage who are Non-resident Aliens (Table 20).

Table 18b shows the continued effects of the economy on faculty hiring this past year. There were only 211 tenure-track vacancies reported in 2009-10, a 15% decrease from 2008-09 and nearly a 60% decrease from 2007-08. Of these, 29.9% were reported unfilled, better than the 35.4% in 2008-09. The fraction of women hired into tenure-track positions (Table 19) rose again in 2009-10, to 26.5% from 23.1% in 2008-09 and 21.9% in 2007-08. With only 19.9% of new Ph.Ds being women, this year’s tenure-track faculty hiring would appear to continue the trend toward increased gender diversity. The fraction of women among new postdocs also rose, from 15.3% to 19.5%. This year there was an increased percentage of new faculty members who are White and those who are Resident Hispanic, while there was a decrease in the percentage who are Non-resident Aliens (Table 20).

There was a slight increase in the overall fraction of women at the assistant and full professor ranks (Table 21). The largest increase again was at the assistant professor level, where the fraction of women rose to 25.8% from 24.3% last year and 21.7% two years ago. There also are more Whites and fewer Asians and Non-resident Aliens among current assistant professors this year compared with last year (Table 22).

For next year, reporting departments forecast a 3% growth in tenure-track faculty. Last year’s forecast was for a 2% growth. U.S. CS departments also forecast a 3% growth for next year, and their actual growth this year was very close to the estimates they made last year.

There was a 9% increase in the overall number of faculty losses this year, due to an increased number of retirements (73 vs 53 last year). As the baby-boomer retirement years commence, it will be interesting to see if this is the beginning of a trend toward higher retirement rates or simply a one-time spike (Table 23).

### Table 18. Actual and Anticipated Faculty Size by Department Type and Rank

<table>
<thead>
<tr>
<th>Department Type and Rank</th>
<th>2009-2010</th>
<th>2010-2011</th>
<th>2011-2012</th>
<th>Expected Two-Year Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>808</td>
<td>829</td>
<td>846</td>
<td>38</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>680</td>
<td>717</td>
<td>741</td>
<td>61</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>629</td>
<td>664</td>
<td>690</td>
<td>61</td>
</tr>
<tr>
<td>US CS Other</td>
<td>3,054</td>
<td>3,203</td>
<td>3,347</td>
<td>293</td>
</tr>
<tr>
<td>US CS Total</td>
<td>5,171</td>
<td>5,413</td>
<td>5,624</td>
<td>453</td>
</tr>
<tr>
<td>US CE</td>
<td>268</td>
<td>291</td>
<td>306</td>
<td>38</td>
</tr>
<tr>
<td>US Information</td>
<td>386</td>
<td>385</td>
<td>402</td>
<td>36</td>
</tr>
<tr>
<td>Canadian</td>
<td>881</td>
<td>886</td>
<td>901</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>6,666</td>
<td>6,975</td>
<td>7,233</td>
<td>567</td>
</tr>
</tbody>
</table>

### Table 18a. Actual and Anticipated US CS Faculty Size by Position and Department Rank

<table>
<thead>
<tr>
<th>Position and Department Rank</th>
<th>2009-2010</th>
<th>2010-2011</th>
<th>2011-2012</th>
<th>Expected 2-Yr Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>TenureTrack</td>
<td>494</td>
<td>449</td>
<td>457</td>
<td>20</td>
</tr>
<tr>
<td>Teaching</td>
<td>69</td>
<td>63</td>
<td>67</td>
<td>-2</td>
</tr>
<tr>
<td>Research</td>
<td>64</td>
<td>58</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Postdoc</td>
<td>142</td>
<td>129</td>
<td>150</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>38</td>
<td>35</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>US CS 1-12</td>
<td>429</td>
<td>35.0</td>
<td>432</td>
<td>33</td>
</tr>
<tr>
<td>Teaching</td>
<td>42</td>
<td>3.7</td>
<td>45</td>
<td>3</td>
</tr>
<tr>
<td>Research</td>
<td>107</td>
<td>10.0</td>
<td>123</td>
<td>16</td>
</tr>
<tr>
<td>Postdoc</td>
<td>132</td>
<td>11.2</td>
<td>142</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>US CS 13-24</td>
<td>399</td>
<td>33.3</td>
<td>420</td>
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<tr>
<td>Teaching</td>
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<td>3.7</td>
<td>45</td>
<td>3</td>
</tr>
<tr>
<td>Research</td>
<td>107</td>
<td>10.0</td>
<td>123</td>
<td>16</td>
</tr>
<tr>
<td>Postdoc</td>
<td>132</td>
<td>11.2</td>
<td>142</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>425</td>
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<td>Teaching</td>
<td>64</td>
<td>5.7</td>
<td>72</td>
<td>8</td>
</tr>
<tr>
<td>Research</td>
<td>50</td>
<td>4.8</td>
<td>61</td>
<td>11</td>
</tr>
<tr>
<td>Postdoc</td>
<td>56</td>
<td>5.2</td>
<td>68</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>34</td>
<td>2.8</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>US CS Other</td>
<td>2,358</td>
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<td>125</td>
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<tr>
<td>Teaching</td>
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<td>2.9</td>
<td>341</td>
<td>30</td>
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<td>Research</td>
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<td>1.7</td>
<td>225</td>
<td>68</td>
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<td>Postdoc</td>
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<td>2.0</td>
<td>258</td>
<td>68</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>0.2</td>
<td>28</td>
<td>13</td>
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</table>
Table 18b. Vacant Positions 2009-2010 by Position and Department Rank and Type

<table>
<thead>
<tr>
<th>Department Rank and Type</th>
<th>Tried to fill</th>
<th>Vacant Positions 2009-2010</th>
<th>% Unfilled</th>
</tr>
</thead>
<tbody>
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<td>US CS 1-12</td>
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<td></td>
<td></td>
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<tr>
<td>TenureTrack</td>
<td>172</td>
<td>119</td>
<td>29.1%</td>
</tr>
<tr>
<td>Research</td>
<td>58</td>
<td>54</td>
<td>6.9%</td>
</tr>
<tr>
<td>Postdoc</td>
<td>117</td>
<td>106</td>
<td>8.5%</td>
</tr>
<tr>
<td>Teaching</td>
<td>178</td>
<td>171</td>
<td>5.1%</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TenureTrack</td>
<td>15</td>
<td>12</td>
<td>4.0%</td>
</tr>
<tr>
<td>Research</td>
<td>14</td>
<td>12</td>
<td>8.6%</td>
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<tr>
<td>Postdoc</td>
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<td>20</td>
<td>7.4%</td>
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<td>Teaching</td>
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<td>19</td>
<td>9.5%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TenureTrack</td>
<td>22</td>
<td>12</td>
<td>5.4%</td>
</tr>
<tr>
<td>Research</td>
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<td>12</td>
<td>8.6%</td>
</tr>
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<td>20</td>
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</tr>
<tr>
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<td>19</td>
<td>9.5%</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td>119</td>
<td>29.1%</td>
</tr>
<tr>
<td>Research</td>
<td>58</td>
<td>54</td>
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<tr>
<td>Postdoc</td>
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<td>106</td>
<td>8.5%</td>
</tr>
<tr>
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<td>171</td>
<td>5.1%</td>
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<td></td>
</tr>
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<td>4</td>
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</tr>
<tr>
<td>Research</td>
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<td>10</td>
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<td>TenureTrack</td>
<td>17</td>
<td>13</td>
<td>23.5%</td>
</tr>
<tr>
<td>Research</td>
<td>2</td>
<td>2</td>
<td>0.0%</td>
</tr>
<tr>
<td>Postdoc</td>
<td>15</td>
<td>13</td>
<td>13.3%</td>
</tr>
<tr>
<td>Teaching</td>
<td>17</td>
<td>17</td>
<td>0.0%</td>
</tr>
<tr>
<td>Canadian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TenureTrack</td>
<td>15</td>
<td>8</td>
<td>46.7%</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>4</td>
<td>50.0%</td>
</tr>
<tr>
<td>Postdoc</td>
<td>7</td>
<td>5</td>
<td>28.6%</td>
</tr>
<tr>
<td>Teaching</td>
<td>24</td>
<td>24</td>
<td>41.7%</td>
</tr>
<tr>
<td>Total</td>
<td>211</td>
<td>144</td>
<td>29.9%</td>
</tr>
<tr>
<td>Research</td>
<td>86</td>
<td>82</td>
<td>7.0%</td>
</tr>
<tr>
<td>Postdoc</td>
<td>154</td>
<td>139</td>
<td>9.1%</td>
</tr>
<tr>
<td>Teaching</td>
<td>230</td>
<td>222</td>
<td>9.6%</td>
</tr>
</tbody>
</table>

Table 19. Gender of Newly Hired Faculty

<table>
<thead>
<tr>
<th>Gender</th>
<th>Tenure-track</th>
<th>Researcher</th>
<th>Postdoc</th>
<th>Teaching Faculty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>182</td>
<td>79.5%</td>
<td>152</td>
<td>77.9%</td>
<td>45</td>
</tr>
<tr>
<td>Female</td>
<td>66</td>
<td>26.5%</td>
<td>15</td>
<td>20.5%</td>
<td>38</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0%</td>
<td>5</td>
<td>19%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>249</td>
<td>73%</td>
<td>195</td>
<td>38%</td>
<td>583</td>
</tr>
</tbody>
</table>
### 2009-2010 Taulbee Survey

#### Table 20. Ethnicity of Newly Hired Faculty

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Tenure-Track</th>
<th>Researcher</th>
<th>Postdoc</th>
<th>Teaching Faculty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonresident Alien</td>
<td>30</td>
<td>26</td>
<td>61</td>
<td>32.3%</td>
<td>5</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>1</td>
<td>0.6%</td>
<td>1</td>
<td>1.4%</td>
<td>2</td>
</tr>
<tr>
<td>Asian</td>
<td>36</td>
<td>20.0%</td>
<td>4</td>
<td>5.6%</td>
<td>39</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>5</td>
<td>2.8%</td>
<td>1</td>
<td>1.4%</td>
<td>4</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>White</td>
<td>88</td>
<td>48.9%</td>
<td>34</td>
<td>47.9%</td>
<td>74</td>
</tr>
<tr>
<td>Multiracial, not Hispanic</td>
<td>2</td>
<td>1.1%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>8</td>
<td>4.4%</td>
<td>1</td>
<td>1.4%</td>
<td>2</td>
</tr>
<tr>
<td>Resident, race/ethnicity unknown</td>
<td>10</td>
<td>5.6%</td>
<td>4</td>
<td>5.6%</td>
<td>7</td>
</tr>
<tr>
<td>Total have Residency Data for</td>
<td>180</td>
<td>71</td>
<td>189</td>
<td>61</td>
<td>501</td>
</tr>
<tr>
<td>Residency Unknown</td>
<td>69</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>249</td>
<td>73</td>
<td>195</td>
<td>66</td>
<td>583</td>
</tr>
</tbody>
</table>

#### Table 21. Gender of Current Faculty

<table>
<thead>
<tr>
<th>Gender</th>
<th>Full</th>
<th>Associate</th>
<th>Assistant</th>
<th>Teaching Faculty</th>
<th>Research Faculty</th>
<th>Postdocs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1,927</td>
<td>87.4%</td>
<td>1,409</td>
<td>74.1%</td>
<td>519</td>
<td>72.2%</td>
<td>396</td>
</tr>
<tr>
<td>Female</td>
<td>277</td>
<td>12.6%</td>
<td>266</td>
<td>15.9%</td>
<td>230</td>
<td>25.8%</td>
<td>200</td>
</tr>
<tr>
<td>Total gender known</td>
<td>2,204</td>
<td>1,675</td>
<td>890</td>
<td>719</td>
<td>489</td>
<td>679</td>
<td>6,656</td>
</tr>
<tr>
<td>Gender unknown</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>2,204</td>
<td>1,677</td>
<td>892</td>
<td>721</td>
<td>492</td>
<td>681</td>
<td>6,667</td>
</tr>
</tbody>
</table>

#### Table 22. Ethnicity of Current Faculty

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Full</th>
<th>Associate</th>
<th>Assistant</th>
<th>Teaching Faculty</th>
<th>Research Faculty</th>
<th>Postdocs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonresident Alien</td>
<td>5</td>
<td>0.3%</td>
<td>37</td>
<td>2.5%</td>
<td>116</td>
<td>14.2%</td>
<td>12</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>2</td>
<td>0.1%</td>
<td>3</td>
<td>0.2%</td>
<td>1</td>
<td>0.1%</td>
<td>1</td>
</tr>
<tr>
<td>Asian</td>
<td>428</td>
<td>21.7%</td>
<td>386</td>
<td>26.4%</td>
<td>240</td>
<td>29.3%</td>
<td>61</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>11</td>
<td>0.6%</td>
<td>17</td>
<td>1.2%</td>
<td>24</td>
<td>2.9%</td>
<td>17</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>10</td>
<td>0.5%</td>
<td>6</td>
<td>0.4%</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>1,476</td>
<td>74.7%</td>
<td>974</td>
<td>66.6%</td>
<td>412</td>
<td>50.3%</td>
<td>543</td>
</tr>
<tr>
<td>Multiracial, not Hispanic</td>
<td>12</td>
<td>0.6%</td>
<td>3</td>
<td>0.2%</td>
<td>3</td>
<td>0.4%</td>
<td>2</td>
</tr>
<tr>
<td>Resident Hispanic, any race</td>
<td>32</td>
<td>1.6%</td>
<td>36</td>
<td>2.5%</td>
<td>23</td>
<td>2.8%</td>
<td>15</td>
</tr>
<tr>
<td>Total have Residency Data for</td>
<td>1,976</td>
<td>1,462</td>
<td>819</td>
<td>652</td>
<td>453</td>
<td>453</td>
<td>582</td>
</tr>
<tr>
<td>Residency, race/ethnicity unknown</td>
<td>65</td>
<td>73</td>
<td>34</td>
<td>20</td>
<td>15</td>
<td>53</td>
<td>260</td>
</tr>
<tr>
<td>Residency Unknown</td>
<td>163</td>
<td>142</td>
<td>39</td>
<td>49</td>
<td>24</td>
<td>46</td>
<td>463</td>
</tr>
<tr>
<td>Total</td>
<td>2,204</td>
<td>1,677</td>
<td>892</td>
<td>721</td>
<td>492</td>
<td>681</td>
<td>6,667</td>
</tr>
</tbody>
</table>

#### Table 23. Faculty Losses

<table>
<thead>
<tr>
<th>Loss Type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Died</td>
<td>11</td>
</tr>
<tr>
<td>Retired</td>
<td>73</td>
</tr>
<tr>
<td>Took Academic Position Elsewhere</td>
<td>46</td>
</tr>
<tr>
<td>Took Nonacademic Position</td>
<td>27</td>
</tr>
<tr>
<td>Remained, but Changed to Part-Time</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
</tr>
<tr>
<td>Unknown</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>208</td>
</tr>
</tbody>
</table>

#### Table 24-1. Total Expenditure from External Sources for CS/CE Research

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>Minimum</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>US CS 1-12</td>
<td>$3,898,400</td>
<td>$24,237,101</td>
<td>$16,925,276</td>
<td>$81,308,897</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>$4,497,242</td>
<td>$11,159,539</td>
<td>$11,551,077</td>
<td>$20,286,667</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>$758,708</td>
<td>$6,900,565</td>
<td>$5,570,869</td>
<td>$23,500,983</td>
</tr>
<tr>
<td>US CS Other</td>
<td>$3,858</td>
<td>$3,719,261</td>
<td>$2,306,925</td>
<td>$55,389,000</td>
</tr>
<tr>
<td>US CE</td>
<td>$146,047</td>
<td>$5,453,512</td>
<td>$4,746,107</td>
<td>$13,178,370</td>
</tr>
<tr>
<td>US Info</td>
<td>$221,605</td>
<td>$3,508,394</td>
<td>$3,042,284</td>
<td>$10,758,084</td>
</tr>
<tr>
<td>Canadian</td>
<td>$103,281</td>
<td>$6,166,551</td>
<td>$2,202,252</td>
<td>$48,545,725</td>
</tr>
</tbody>
</table>
### Table 24-2. Per Capita Expenditure from External Sources for CS/CE Research by Department Rank and Type

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>Per Capita Expenditure (Tenure-Track Faculty Only)</th>
<th>Per Capita Expenditure (Tenure-Track, Research, and Postdoctorate Faculty)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Mean</td>
</tr>
<tr>
<td>US CS 1-12</td>
<td>$203,939</td>
<td>$457,435</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>$174,947</td>
<td>$327,100</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>$47,419</td>
<td>$193,016</td>
</tr>
<tr>
<td>US CS Other</td>
<td>$168</td>
<td>$161,058</td>
</tr>
<tr>
<td>US CE</td>
<td>$18,256</td>
<td>$365,936</td>
</tr>
<tr>
<td>US Info</td>
<td>$16,415</td>
<td>$259,061</td>
</tr>
<tr>
<td>Canadian</td>
<td>$3,130</td>
<td>$161,630</td>
</tr>
</tbody>
</table>

### Table 25. Graduate Students Supported as Full-Time Students by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>Number on Institutional Funds</th>
<th>Number on External Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teaching Assistants</td>
<td>Research Assistants</td>
</tr>
<tr>
<td>US CS 1-12</td>
<td>662</td>
<td>389</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>341</td>
<td>310</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>336</td>
<td>127</td>
</tr>
<tr>
<td>US CS Other</td>
<td>1,725</td>
<td>492</td>
</tr>
<tr>
<td>US CE</td>
<td>103</td>
<td>27</td>
</tr>
<tr>
<td>US Information</td>
<td>86</td>
<td>78</td>
</tr>
<tr>
<td>Canadian</td>
<td>467</td>
<td>240</td>
</tr>
<tr>
<td>Total</td>
<td>3,720</td>
<td>1,663</td>
</tr>
</tbody>
</table>

### Table 26-1. Fall 2010 Academic-Year Graduate Stipends by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>Teaching Assistantships</th>
<th>Research Assistantships</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Mean</td>
</tr>
<tr>
<td>US CS 1-12</td>
<td>11,400</td>
<td>19,448</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>3,697</td>
<td>19,590</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>7,573</td>
<td>17,542</td>
</tr>
<tr>
<td>US CS Other</td>
<td>800</td>
<td>15,023</td>
</tr>
<tr>
<td>US CE</td>
<td>8,800</td>
<td>15,228</td>
</tr>
<tr>
<td>US Information</td>
<td>8,955</td>
<td>16,556</td>
</tr>
<tr>
<td>Canadian</td>
<td>3,000</td>
<td>10,891</td>
</tr>
</tbody>
</table>

### Table 26-2. Fall 2010 Academic-Year Graduate Stipends by Department Type and Rank

<table>
<thead>
<tr>
<th>Department, Rank</th>
<th>Full-Support Fellows</th>
<th>Assistantships for Computer Systems Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Mean</td>
</tr>
<tr>
<td>US CS 1-12</td>
<td>19,600</td>
<td>24,021</td>
</tr>
<tr>
<td>US CS 13-24</td>
<td>17,270</td>
<td>25,956</td>
</tr>
<tr>
<td>US CS 25-36</td>
<td>11,250</td>
<td>21,306</td>
</tr>
<tr>
<td>US CS Other</td>
<td>8,395</td>
<td>21,913</td>
</tr>
<tr>
<td>US CE</td>
<td>18,000</td>
<td>23,450</td>
</tr>
<tr>
<td>US Information</td>
<td>15,000</td>
<td>22,819</td>
</tr>
<tr>
<td>Canadian</td>
<td>14,684</td>
<td>19,716</td>
</tr>
</tbody>
</table>
2009-2010 Taulbee Survey

Departments that reported data for that range of salaries in a given rank among those reporting salary data provided salaries at the individual level. We also report data salary based on time in rank, for meaningful comparison of individual or departmental faculty salaries with national averages. We report associate professor salaries for time in rank of 7 years or less, and of more than 7 years. For full professors, we report time in rank of 7 years or less, 8 to 15 years, and more than 15 years. The minimum and maximum of the reported salary minima (and maxima) are self-explanatory. The range of salaries in a given rank among departments that reported data for that rank is the interval (“minimum of the minima”, “maximum of the maxima”).

The mean of the reported salary minima (maxima) in a given rank is computed by summing the number of departments reporting data at that rank. The “average of dept mean salaries” at each rank is computed by summing the individual means reported at each rank and dividing by the number of departments reporting at that rank. Thus, it is not a true median of all the salaries. Similarly, “average of dept mean salaries” at each rank is computed by summing the individual means reported at each rank and dividing by the number of departments reporting at that rank and then joining departments as tenure-track faculty in U.S. departments decreased 1.7% from those reported in last year’s survey (Table 35). In each of the previous years, 85% of those reporting salary data provided salaries at the individual level. The tables contain data about realities, coupled with the effects of retirements and resignations of persons with relatively high salaries in their rank and the hirings and promotions of persons new to their rank. Canadian salaries (Table 33) rose 1.9% to 3.1% among tenure-track ranks, with the largest increase at the associate professor rank and the smallest at the assistant professor rank. Non-tenure-track teaching faculty salaries for Canadian departments rose 10.6%. While these increases are much better than the U.S. CS increases, they are lower than the corresponding Canadian increases last year. Because of the size of the sample sizes, Canadian values are affected more strongly than are U.S. values by the particular set of schools that responded to this year’s survey compared to those who responded last year. Average salaries for new Ph.D.s (those who received their Ph.D. last year and then joined departments as tenure-track faculty) in U.S.

### Table 27. Nine-month Salaries, 150 Responses of 184 US CS Computer Science Departments

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept Mean Salaries</th>
<th>Average of Dept Median Salaries</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>527</td>
<td>$84,681</td>
<td>$120,059</td>
<td>$186,200</td>
<td>$143,533</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>536</td>
<td>$88,279</td>
<td>$123,121</td>
<td>$215,079</td>
<td>$140,267</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>556</td>
<td>$83,376</td>
<td>$115,317</td>
<td>$219,734</td>
<td>$129,198</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>90</td>
<td>$92,716</td>
<td>$117,594</td>
<td>$147,993</td>
<td>$142,606</td>
</tr>
<tr>
<td>Full Professor: total</td>
<td>1,708</td>
<td>$83,376</td>
<td>$137,795</td>
<td></td>
<td>$155,083</td>
</tr>
<tr>
<td>Assoc, in rank 8 years +</td>
<td>314</td>
<td>$51,150</td>
<td>$92,419</td>
<td>$126,600</td>
<td>$99,816</td>
</tr>
<tr>
<td>Assoc, in rank 0-7 years</td>
<td>834</td>
<td>$72,079</td>
<td>$97,011</td>
<td>$145,135</td>
<td>$104,128</td>
</tr>
<tr>
<td>Assoc, yrs in rank not given</td>
<td>86</td>
<td>$74,387</td>
<td>$93,334</td>
<td>$110,840</td>
<td>$100,600</td>
</tr>
<tr>
<td>Assoc Professor: total</td>
<td>1,234</td>
<td>$51,150</td>
<td>$102,785</td>
<td></td>
<td>$163,218</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>704</td>
<td>$61,538</td>
<td>$86,079</td>
<td>$105,700</td>
<td>$89,754</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td>948</td>
<td>$25,000</td>
<td>$68,360</td>
<td>$114,444</td>
<td>$81,308</td>
</tr>
</tbody>
</table>

### Table 28. Nine-month Salaries, 11 Responses of 12 US Computer Science Departments Ranked 1-12

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept Mean Salaries</th>
<th>Average of Dept Median Salaries</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>109</td>
<td>$104,922</td>
<td>$127,152</td>
<td>$186,200</td>
<td>$169,048</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>91</td>
<td>$103,548</td>
<td>$129,299</td>
<td>$179,061</td>
<td>$152,521</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>82</td>
<td>$97,025</td>
<td>$119,422</td>
<td>$154,200</td>
<td>$138,851</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>4</td>
<td>$97,025</td>
<td>$119,422</td>
<td>$154,200</td>
<td>$138,851</td>
</tr>
<tr>
<td>Full Professor: total</td>
<td>286</td>
<td>$83,420</td>
<td>$99,446</td>
<td>$118,856</td>
<td>$104,386</td>
</tr>
<tr>
<td>Assoc, in rank 8 years +</td>
<td>10</td>
<td>$83,420</td>
<td>$103,144</td>
<td>$127,400</td>
<td>$115,212</td>
</tr>
<tr>
<td>Assoc, in rank 0-7 years</td>
<td>111</td>
<td>$65,685</td>
<td>$83,420</td>
<td>$114,986</td>
<td>$115,490</td>
</tr>
<tr>
<td>Assoc, yrs in rank not given</td>
<td>1</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Assoc Professor: total</td>
<td>122</td>
<td>$83,420</td>
<td>$114,317</td>
<td></td>
<td>$144,100</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>82</td>
<td>$76,014</td>
<td>$90,308</td>
<td>$105,700</td>
<td>$96,194</td>
</tr>
</tbody>
</table>

### Table 29. Nine-month Salaries, 11 Responses of 12 US Computer Science Departments Ranked 1-12

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept Mean Salaries</th>
<th>Average of Dept Median Salaries</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>54</td>
<td>$50,273</td>
<td>$72,059</td>
<td>$116,000</td>
<td>$86,335</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>49</td>
<td>$68,096</td>
<td>$81,291</td>
<td>$98,160</td>
<td>$108,606</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>135</td>
<td>$20,000</td>
<td>$40,228</td>
<td>$60,000</td>
<td>$56,917</td>
</tr>
</tbody>
</table>
two years, salaries for new Ph.D.s increased between 1.0% and 1.5%. There are about 70% as many new Ph.D. salaries reported this year compared with last year. Again this year, there were too few new Ph.D. salaries in Canadian departments to make meaningful comparisons.

Concluding Observations

Despite difficult economic times, academic computing programs seem to have held their own in 2009-10. Undergraduate enrollments increased, and graduate enrollments held steady. Though a smaller fraction of doctoral graduates took tenure-track positions available at North American Ph.D.-granting departments and positions in industry, post-doctoral positions utilizing the graduates’ doctoral computing expertise were available to them. It will be interesting to see the impact on the future job market of this increased number of persons with post-doctoral research experience. It also will be interesting to see if the use of post-doctoral research positions continues near its present level once economic conditions improve.

Rankings

For tables that group computer science departments by rank, the rankings are based on information collected in the 1995 assessment of research and doctorate programs in the United States conducted by the National Research Council (NRC) [see: http://archive.crac.org/statistics/mnr estad2/2home.html]. The top twelve schools in this ranking are Stanford, Massachusetts Institute of Technology, University of California (Berkeley), Carnegie Mellon, Cornell, Princeton, University of Texas (Austin), University of Illinois (Urbana-Champaign), University of Washington, University of Wisconsin (Madison), Harvard, and California Institute of Technology. All schools in this ranking participated in the survey this year with the exception of the California Institute of Technology.

CS departments ranked 13-24 are: Brown, Yale, University of California (Los Angeles), University of Maryland (College Park), New York University, University of Massachusetts (Amherst), Rice, University of Southern California, University of Michigan, University of California (San Diego), Columbia, and University of Pennsylvania.4 All schools in this ranking participated in the survey this year.

CS departments that are ranked above 36 or that are unranked that responded to the survey include: Arizona State University, Auburn, Boston University, Brandeis, Case Western Reserve, City University of New York Graduate Center, College of William and Mary, Colorado State University of Mines, Colorado State, Dartmouth, DePaul, Drexel, Florida Institute of Technology, Florida International, Florida State, George Mason, George Washington, Georgia State, Illinois Institute of Technology, Iowa State, Johns Hopkins, Kansas State, Kent State, Lehigh, Louisiana State, Michigan State, Michigan Technological, Mississippi State, Montana State, Naval Postgraduate School, New Mexico Institute of Mining and Technology, New Mexico State, North Carolina State, Northern State, Northwestern, Oakland, Ohio, Ohio State, Old Dominion, Oregon State, Pace, Pennsylvania State, Polytechnic, Portland State, Rensselaer Polytechnic, Rochester Institute of Technology, Southern Illinois University (Carbondale), Stevens Institute of Technology, Syracuse, Texas A&M, Texas Tech, Toyoda Technological Institute (Chicaco), Tufts, Vanderbilt, Virginia Tech, Washington State, Washington (St. Louis), Wayne State, Western Michigan, Worcester Polytechnic, and Wright State.

University of Alabama: Birmingham, Huntsville, and Tuscaloosa, Alabama, Arkansas (Fayetteville), Buffalo, California (at Davis, Riverside, Santa Barbara, and Santa Cruz), Central Florida, Cincinnati, Colorado (Boulder and Colorado Springs), Connecticut, Delaware, Florida, Georgia, Idaho, Illinois

Table 29. Nine-month Salaries, 12 Responses of 12 US Computer Science Departments Ranked 13-24

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept. Mean</th>
<th>Average of Dept. Median</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last year</td>
<td>16 years +</td>
<td>$98,400</td>
<td>$128,098</td>
<td>$149,523</td>
<td>$167,582</td>
</tr>
<tr>
<td></td>
<td>8-15 years</td>
<td>$98,400</td>
<td>$125,972</td>
<td>$164,024</td>
<td>$156,261</td>
</tr>
<tr>
<td></td>
<td>0-7 years</td>
<td>$102,600</td>
<td>$123,976</td>
<td>$140,300</td>
<td>$147,954</td>
</tr>
<tr>
<td></td>
<td>Less than 7</td>
<td>$94,000</td>
<td>*</td>
<td>*</td>
<td>$169,476</td>
</tr>
<tr>
<td></td>
<td>Full Professor</td>
<td>232</td>
<td>$98,400</td>
<td>$158,267</td>
<td>$270,583</td>
</tr>
<tr>
<td></td>
<td>Assoc, 0-7</td>
<td>$74,473</td>
<td>$104,415</td>
<td>$126,600</td>
<td>$110,715</td>
</tr>
<tr>
<td></td>
<td>Less than 7</td>
<td>$95,600</td>
<td>$106,798</td>
<td>$137,700</td>
<td>$112,775</td>
</tr>
<tr>
<td></td>
<td>Assoc, yrs not given</td>
<td>5</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Assoc Professor</td>
<td>97</td>
<td>$74,473</td>
<td>$121,394</td>
<td>$150,728</td>
</tr>
<tr>
<td></td>
<td>Assistant Professor</td>
<td>64</td>
<td>$86,250</td>
<td>$92,478</td>
<td>$96,900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$102,241</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>37</td>
<td>$49,920</td>
<td>$75,291</td>
<td>$104,250</td>
<td>$86,505</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>102</td>
<td>$27,000</td>
<td>$83,995</td>
<td>$114,444</td>
<td>$104,967</td>
</tr>
<tr>
<td>Postdoctorates</td>
<td>109</td>
<td>$22,500</td>
<td>$42,973</td>
<td>$55,000</td>
<td>$54,815</td>
</tr>
</tbody>
</table>

Table 30. Nine-month Salaries, 12 Responses of 12 US Computer Science Departments Ranked 25-36

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept. Mean</th>
<th>Average of Dept. Median</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last year</td>
<td>16 years +</td>
<td>$98,534</td>
<td>$117,249</td>
<td>$135,587</td>
<td>$146,131</td>
</tr>
<tr>
<td></td>
<td>8-15 years</td>
<td>$104,000</td>
<td>$120,299</td>
<td>$141,282</td>
<td>$146,833</td>
</tr>
<tr>
<td></td>
<td>0-7 years</td>
<td>$96,500</td>
<td>$114,282</td>
<td>$128,757</td>
<td>$139,402</td>
</tr>
<tr>
<td></td>
<td>Less than 7</td>
<td>$96,500</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Full Professor</td>
<td>226</td>
<td>$96,500</td>
<td>$143,576</td>
<td>$313,660</td>
</tr>
<tr>
<td></td>
<td>Assoc, 0-7</td>
<td>$72,484</td>
<td>$92,746</td>
<td>$125,483</td>
<td>$96,762</td>
</tr>
<tr>
<td></td>
<td>Less than 7</td>
<td>$85,527</td>
<td>$99,546</td>
<td>$115,350</td>
<td>$107,172</td>
</tr>
<tr>
<td></td>
<td>Assoc, yrs not given</td>
<td>88</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Assoc Professor</td>
<td>117</td>
<td>$72,484</td>
<td>$104,592</td>
<td>$125,200</td>
</tr>
<tr>
<td></td>
<td>Assistant Professor</td>
<td>85</td>
<td>$77,822</td>
<td>$88,045</td>
<td>$95,360</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>57</td>
<td>$43,260</td>
<td>$60,736</td>
<td>$90,508</td>
<td>$78,127</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>74</td>
<td>$33,996</td>
<td>$66,514</td>
<td>$106,000</td>
<td>$81,110</td>
</tr>
<tr>
<td>Postdoctorates</td>
<td>60</td>
<td>$31,099</td>
<td>$40,784</td>
<td>$60,000</td>
<td>$49,814</td>
</tr>
</tbody>
</table>

* Values which are too revealing of individual department information, or which provide the distribution of fewer than 10 individuals, are not shown.
## Table 31. Nine-month Salaries, 115 Responses of 148 US Computer Science Departments Ranked Higher than 36 or Unranked

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Tenured &amp; Tenure-Track</th>
<th># of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept. Mean Salaries</th>
<th>Average of Dept. Median Salaries</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>283</td>
<td>$84,681</td>
<td>$119,563</td>
<td>$174,849</td>
<td>$136,959</td>
<td>$134,899</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>291</td>
<td>$88,279</td>
<td>$122,339</td>
<td>$215,079</td>
<td>$136,176</td>
<td>$134,286</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>318</td>
<td>$83,376</td>
<td>$113,849</td>
<td>$219,734</td>
<td>$124,378</td>
<td>$122,680</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>72</td>
<td>$92,716</td>
<td>$112,940</td>
<td>$133,482</td>
<td>$136,534</td>
<td>$134,899</td>
</tr>
<tr>
<td>Full Professor: total</td>
<td>964</td>
<td>$83,376</td>
<td>$113,849</td>
<td>$219,734</td>
<td>$136,534</td>
<td>$134,899</td>
</tr>
<tr>
<td>Assoc, in rank 8 years +</td>
<td>258</td>
<td>$51,150</td>
<td>$90,775</td>
<td>$125,340</td>
<td>$98,814</td>
<td>$99,048</td>
</tr>
<tr>
<td>Assoc, in rank 0-7 years</td>
<td>560</td>
<td>$72,079</td>
<td>$94,980</td>
<td>$145,135</td>
<td>$101,714</td>
<td>$100,887</td>
</tr>
<tr>
<td>Assoc, yrs in rank not given</td>
<td>80</td>
<td>$74,387</td>
<td>$90,528</td>
<td>$110,840</td>
<td>$98,142</td>
<td>$93,355</td>
</tr>
<tr>
<td>Assoc Professor: total</td>
<td>898</td>
<td>$51,150</td>
<td>$90,775</td>
<td>$125,340</td>
<td>$98,814</td>
<td>$99,048</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>473</td>
<td>$61,538</td>
<td>$84,694</td>
<td>$101,290</td>
<td>$88,052</td>
<td>$87,887</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td>335</td>
<td>$62,000</td>
<td>$99,331</td>
<td>$120,451</td>
<td>$65,343</td>
<td>$64,962</td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>143</td>
<td>$24,115</td>
<td>$63,214</td>
<td>$113,922</td>
<td>$71,799</td>
<td>$72,427</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>170</td>
<td>$20,250</td>
<td>$41,012</td>
<td>$75,000</td>
<td>$47,261</td>
<td>$46,211</td>
</tr>
</tbody>
</table>

## Table 32. Nine-month Salaries, 12 Responses of 31 US Computer Engineering Departments

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Tenured &amp; Tenure-Track</th>
<th>Number of Faculty</th>
<th>Reported Salary Minimum</th>
<th>Average of Dept. Mean Salaries</th>
<th>Average of Dept. Median Salaries</th>
<th>Reported Salary Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>30</td>
<td>$95,308</td>
<td>$125,664</td>
<td>$182,400</td>
<td>$139,825</td>
<td>$135,168</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>28</td>
<td>$90,900</td>
<td>$109,940</td>
<td>$135,323</td>
<td>$130,212</td>
<td>$125,372</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>23</td>
<td>$89,109</td>
<td>$108,666</td>
<td>$129,600</td>
<td>$115,395</td>
<td>$110,920</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>10</td>
<td>$127,496</td>
<td>*</td>
<td>*</td>
<td>$169,171</td>
<td>$166,544</td>
</tr>
<tr>
<td>Full Professor: total</td>
<td>91</td>
<td>$89,109</td>
<td>$108,666</td>
<td>$129,600</td>
<td>$115,395</td>
<td>$110,920</td>
</tr>
<tr>
<td>Assoc, in rank 8 years +</td>
<td>25</td>
<td>$57,800</td>
<td>$86,632</td>
<td>$102,600</td>
<td>$95,837</td>
<td>$96,410</td>
</tr>
<tr>
<td>Assoc, in rank 0-7 years</td>
<td>40</td>
<td>$85,959</td>
<td>$94,386</td>
<td>$109,200</td>
<td>$98,454</td>
<td>$97,571</td>
</tr>
<tr>
<td>Assoc, yrs in rank not given</td>
<td>10</td>
<td>$87,150</td>
<td>$97,093</td>
<td>$113,601</td>
<td>$99,135</td>
<td>$103,789</td>
</tr>
<tr>
<td>Assoc Professor: total</td>
<td>75</td>
<td>$57,800</td>
<td>$86,632</td>
<td>$102,600</td>
<td>$95,837</td>
<td>$96,410</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>38</td>
<td>$79,761</td>
<td>$88,825</td>
<td>$83,776</td>
<td>$87,143</td>
<td>$87,529</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td>19</td>
<td>$50,929</td>
<td>$86,504</td>
<td>$67,147</td>
<td>$75,186</td>
<td>$73,389</td>
</tr>
<tr>
<td>Teaching Faculty</td>
<td>20</td>
<td>$30,720</td>
<td>$52,544</td>
<td>$81,000</td>
<td>$71,019</td>
<td>$68,463</td>
</tr>
<tr>
<td>Research Faculty</td>
<td>23</td>
<td>$20,004</td>
<td>$42,488</td>
<td>$75,000</td>
<td>$50,661</td>
<td>$50,505</td>
</tr>
</tbody>
</table>

## Acknowledgments

Betsy Bizot once again provided valuable assistance with the data collection, tabulation, and analysis for this survey. Thanks also are due to Betsy and to Jean Smith for their careful reading of the report and for their helpful suggestions to improve it.

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

Information (I) programs included here are Information Science, Information Systems, Information Technology, Informatics, and related disciplines with a strong computing component. In fall 2008, the first year these programs were surveyed as part of Taulbee, surveys were sent to CRA members, the CRA Deans group members, and participants in the Schools Caucus (www.schools.cra.org) that met the criteria of granting Ph.D.s and being located in North America. Other I-programs that meet these criteria and would like to participate in the survey in future years are invited to contact contact@ cra.org for inclusion.

The set of departments responding varies slightly from year to year, even when the total numbers are the same; thus, we must approach any trend analysis with caution. We must be especially cautious in using the data about CE and I departments because of the low response rate.

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

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

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

All faculty tables: The survey makes no distinction between faculty specializing in CS vs. CE programs. Every effort is made to minimize the inclusion of faculty in electrical engineering who are not computer engineers.
## 2009-2010 Taulbee Survey

### Table 33. Twelve-month Salaries, 18 Responses of 30 Canadian Computer Science Departments (Canadian Dollars)

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>$123,993</td>
<td>$147,349</td>
<td>$188,220</td>
<td>$158,034</td>
<td>$157,025</td>
<td>$124,130</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>$117,184</td>
<td>$136,005</td>
<td>$153,651</td>
<td>$149,656</td>
<td>$148,627</td>
<td>$134,148</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>$104,907</td>
<td>$124,518</td>
<td>$151,067</td>
<td>$142,797</td>
<td>$140,717</td>
<td>$112,541</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

### Table 34. Nine-month Salaries, 16 Responses of 22 US Information Departments

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full, in rank 16 years +</td>
<td>$81,000</td>
<td>$128,968</td>
<td>$250,000</td>
<td>$141,987</td>
<td>$144,362</td>
<td>$107,600</td>
</tr>
<tr>
<td>Full, in rank 8-15 years</td>
<td>$86,449</td>
<td>$116,993</td>
<td>$165,363</td>
<td>$133,547</td>
<td>$133,830</td>
<td>$86,449</td>
</tr>
<tr>
<td>Full, in rank 0-7 years</td>
<td>$45,984</td>
<td>$113,769</td>
<td>$146,700</td>
<td>$133,535</td>
<td>$131,443</td>
<td>$120,000</td>
</tr>
<tr>
<td>Full, yrs in rank not given</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

### Table 35. Nine-month Salaries for New PhDs, Responding US CS, CE, and I Departments

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure-Track</td>
<td>$62,071</td>
<td>$85,511</td>
<td>$95,004</td>
<td>$85,817</td>
<td>$85,937</td>
<td>$70,000</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td>$33,000</td>
<td>$56,459</td>
<td>$70,000</td>
<td>$78,039</td>
<td>$71,405</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

### Table 35a. Twelve-month Salaries for New PhDs, Responding Canadian Departments

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure-Track</td>
<td>$50,000</td>
<td>$61,270</td>
<td>$82,000</td>
<td>$61,270</td>
<td>$61,270</td>
<td>$50,000</td>
</tr>
<tr>
<td>Non-Tenure-Track</td>
<td>$20,004</td>
<td>$47,523</td>
<td>$87,805</td>
<td>$51,710</td>
<td>$51,067</td>
<td>$50,000</td>
</tr>
</tbody>
</table>
positions are part of the recently established IT-Security center "CISPA—Center for IT-Security, Privacy, and Accountability". CISPA was established as part of the German initiative to create three distinguished centers of excellence in cyber research in Tübingen, ÖGI, and CISPA. CISPA covers the whole range of research problems in IT-Security, privacy, and accountability, from fundamental research questions to the development of new technologies and prototypes for practical application. CISPA moreover seeks to shorten the path from research to practical applications through a network of collaborations including the German research Center for Artificial Intelligence (DFKI).

Applications are invited for positions in all areas related to IT-Security, privacy, and accountability. These areas include, but are not limited to:

- design and formal verification of security protocols, programs, and algorithms;
- cryptography; network and operating systems security; web security; privacy enhancing technologies in a broad sense; privacy in data acquisition, processing, and publishing; reliability, accountability and trust; security and privacy in decentralized systems;
- as well cross-cutting disciplines such as usability and social aspects in this research field.

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. Moreover, active participation in teaching is required. The working and teaching language is English.

Saarland University is the home of one of the highest-ranked CS departments in Germany. In the department’s immediate proximity are the Max Planck Institute for Informatics, the Max Planck Institute for Software Systems, and the German Center for Artificial Intelligence (DFKI), the Excellence Cluster for Multimodal Computing and Interaction (MMCI), the Saarbruecken Graduate School of Computer Science, as well as the Intel Visual Computing Institute (VCI). The close interactions and collaborations between these institutes, and their joint interest in IT-Security research, enable CISPA to address research problems in IT-Security in a comprehensive manner, from fundamental research questions to the development of prototype systems for practical application.

Saarland University and CISPA are located in Saarbruecken, in the tri-border area of Germany, France, and Luxembourg.

Dr. Ittay Weiss last visited the University of California at Berkeley in 2007, and has held a number of visiting positions during the past years. His current research interests are in security protocols, privacy, and accountability.

For further information please visit the INC homepage at http://www.inc.cuhk.edu.hk or contact Prof. Raymond Yeung at whyeung@ie.cuhk.edu.hk.
University of Maryland, Baltimore County
Computer Science Lecturer

The Department of Computer Science and Electrical Engineering of the University of Maryland, Baltimore County (UMBC) invites applications for a non-tenure track Lecturer position to begin August 23, 2011. Candidates should be able to teach a variety of undergraduate computer science courses. A demonstrated ability to teach such courses and a strong interest in teaching undergraduates are essential. Applicants must have received an M.S. or Ph.D. in computer science, computer engineering, electrical engineering, or a related discipline before being appointed.

The Department offers B.S., M.S., and Ph.D. degrees and currently has 39 full time teaching faculty, 15 research faculty, 886 undergraduate majors, 310 graduate students, and over $6.4M per year in sponsored research expenditures. UMBC is located near the BWI Airport, and is close to many federal agencies and industry research laboratories. Submit a cover letter, brief statement of teaching experience and interests, and complete CV to search@cs.umbc.edu by March 15, 2011. Applicants should arrange for three letters of reference to be sent to the same address. Applications will be reviewed as they are received and will continue until the position is filled. For additional information about UMBC and the Department see http://www.cs.umbc.edu/.

UMBC is an affirmative action/equal opportunity employer and is a recent recipient of a National Science Foundation ADVANCE award to promote hiring and advancement of women in science and engineering. We welcome applications from women, minorities, and individuals with disabilities.
Professional Opportunities

Qatar Foundation seeks

Computer Scientists

Qatar Computing Research Institute, part of Qatar Foundation for Education, Science and Community Development is inviting applications for research positions at the level of scientist, senior scientist, and principle scientist. The roles’ responsibilities and minimum requirements are described below. Outstanding candidates in all areas of computer science will be considered with a focus on the following research areas:

- Arabic Language Technologies, including NLP, IR, MT
- Internet Computing, including Cloud Computing and Social Networking
- Data Analytics, including Data Mining and Machine Learning
- Advanced Computer Hardware Design
- High Performance Computing
- Bioinformatics

Candidates with multidisciplinary research interests are highly encouraged to apply.

1. Principal Scientist:
The Principal Scientist is a senior departmental leader within QCRI who is responsible for leading and conducting scientific research work of strategic importance to Qatar. The Principal Scientist will have the primary responsibility in defining the methodology for conducting research and for evaluating research results in order to ensure the highest standards of practice and research quality, aligning research activities with QCRI’s mission and vision. The candidate must be a mature scientist with both theoretical and applied skills. A PhD in computer science from a top-tier institution and a strong record of major accomplishments and publications are required.

2. Senior Scientist/Scientist/Visiting Scientist:
Senior scientists, scientists, and visiting scientists are expected to contribute towards the research efforts of QCRI and to develop research expertise tackling the research challenges in the areas mentioned above. The scientist will work as part of a research team, collaborating with peer researchers and software engineers to develop solutions, necessary prototypes, and intellectual property in the form of disclosures and patent applications. A PhD in computer science from a top-tier institution and a strong record of major accomplishments and publications are required.

3. Senior Software Engineer/Software Engineer:
Senior Software Engineers and Software Engineers will lead and be actively involved with researchers in the analysis, design, development, and implementation of in-house-developed application systems. They will establish technical objectives, design and execute work-plans, and manage software development projects as appropriate. Minimum requirements are a Bachelor’s degree in Computer Science, Computer Engineering, or a related field and a minimum of 6 years (senior software engineer) or 3 years (software engineer) of progressive and directly related experience.

The compensation will include attractive tax-free salary and additional benefits such as furnished accommodation, annual paid leave, medical insurance, etc. If interested and fulfill the criteria, kindly email your resume including the position applied for in the subject to careers@qcri.org. The closing date to receive applications is June 15, 2011. Please note that only qualified applicants will be notified.

The State of Qatar is an Arab state in Southwest Asia, occupying the small Qatar Peninsula on the eastern coast of the larger Arabian Peninsula. More than 100 nationalities live and work in harmony in the country of 1.5 million people.

Qatar Foundation is a private, chartered, nonprofit organization, founded in 1995 by His Highness Sheikh Hamad Bin Khalifa Al-Thani, Emir of Qatar. Guided by the principle that a nation’s greatest resource is the potential of its people, Qatar Foundation aims to develop that potential through a network of centers devoted to progressive education, research and community welfare.

Qatar Computing Research Institute conducts world-class, applied computing research, creating knowledge and supporting innovation in select areas of computing science that will have long-term relevance and lasting value for Qatar. QCRI will use its expertise to implement Qatar’s national computing research strategy, and will employ a unique, collaborative, and interdisciplinary approach with exceptional research and support staff equipped with outstanding tools and facilities shared between QCRI and other Qatari institutes.

For more information, please visit www.qcri.org