Computing Degree and Enrollment Trends

From the 2009-2010 CRA Taulbee Survey

Undergraduate Degree Production in Computer Science Rises

While Enrollment Grows for Third Straight Year

By Stuart Zweben

Executive Summary

Summary of Results

- Total enrollment among U.S. computer science undergraduates increased 10 percent. This is the third straight year of increases in total enrollment, and indicates that the post dot-com decline in undergraduate computing program enrollments is over.

- Overall bachelor's degree production in U.S. computing programs in 2010 rose nearly 11 percent compared to 2009, reversing several years of declining bachelor's degree production.

- Total Ph.D. graduate production held steady in 2009-2010.

- Among CRA member schools, the share of bachelor's degrees in CS granted to females rose to 13.8 percent in 2010, an increase of 2.5 percentage points over 2009. The share of bachelor's degrees in CS granted to minority students held nearly steady at 10.3 percent in 2010.

Introduction

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 enrollment and degree production results from the 40th annual CRA Taulbee Survey. The full report, which also includes information about faculty size, demographics and salaries, graduate student support and research expenditures, will be available in May 2011 at www.cra.org.

Information for the survey is gathered from CRA's member institutions during the Fall of each year. Responses received by January 5, 2011 are included in this year's analysis. The period covered by the data varies from table to table. Degree production and enrollment (Ph.D., Master's, and Bachelor's) refer to the previous academic year (2009-2010). Data for new students in all categories refer to the current academic year (2010-2011).

For this report, we surveyed a total of 265 Ph.D.-granting departments. Of the departments surveyed, 195 returned their survey forms, for a response rate of 74 percent. This is higher than last year's 71 percent. There is a lower response rate from the I departments (68 percent – but their participation in 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).

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. We thank all

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[1] 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.

[2] Information (I) programs included here are Information Science, Information Systems, Information Technology, Informatics, and related disciplines with a strong computing component. Surveys were sent to CRA members, the CRA Deans group members, and participants in the iSchools Caucus (www.ischools.org) who met the criteria of granting Ph.D.s and being located in North America.

respondents who completed this year's questionnaire. Departments that participated are listed at the end of this article.

Table 1. Number of Respondents to the Taulbee Survey					
Year	US CS Depts.	US CE Depts.	Canadian	US I-Schools	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	148/170 (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	151/183 (83%)	12/32 (38%)	20/30 (67%)	9/19 (47%)	192/264 (73%)
2009	147/184 (80%)	13/31 (42%)	16/30 (53%)	12/20 (60%)	188/265 (71%)
2010	150/184 (82%)	12/30 (40%)	18/29 (62%)	15/22 (68%)	195/265 (74%)

Bachelor's Degree Production and Enrollments

Overall bachelor's degree production in 2010 rose nearly 11 percent from that in 2009. Bachelor's degree production in US computer science departments also was up more than 9 percent. The increases in new students observed during each of the past two years have resulted in increased degree production, a welcome turnaround from the past several years of declining bachelor's degree production.

**Figure 1. BS Total Enrollment - Avg. Majors per US CS Dept.**
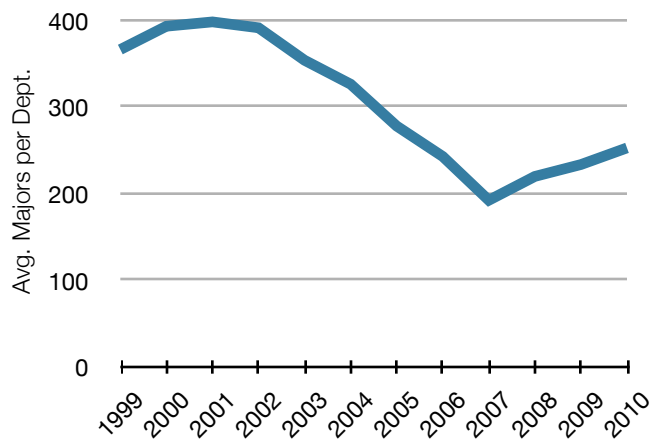
The number of new students in US CS programs continues to increase. The number of new CS majors among US computer science departments is about the same as last year, but there was a huge (50 percent) increase in the number of new pre-majors (students who are pursuing a curriculum for the major in computer 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 nonzero numbers of premajors last year and this year, the increase was 22 percent. Total enrollment among majors and pre-majors in US CS departments increased 10 percent. This is the third straight year of increases in total enrollment, and indicates that the post "dot-com crash" decline in undergraduate computing program enrollments is over.

Figure 2. BS Production (CS & CE)

In Canada, the number of new CS majors increased for the third straight year, by nearly 4 percent, while the total number of CS majors declined by nearly 8 percent. Bachelor's degree production in Canada increased by more
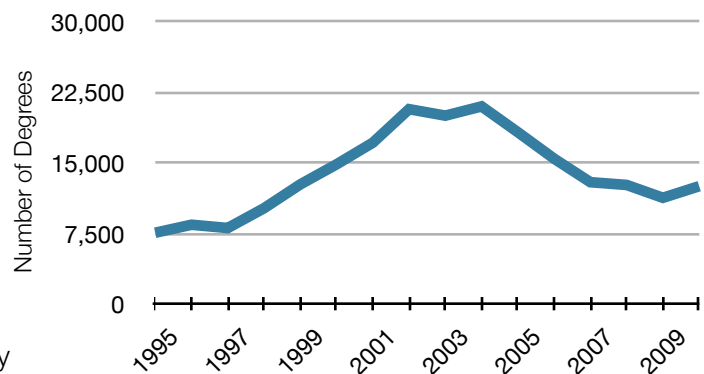
than 15 percent. Since there are relatively few Canadian departments reporting, these trends are significantly influenced by the specific departments reporting.

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 appears comparable to that 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.

Table 2. Gender of Bachelor's Recipients								
	CS		CE		I		Total	
Male	7,622	86.2%	1,427	89.6%	1,625	85.5%	10,674	86.6%
Female	1,216	13.8%	166	10.4%	275	14.5%	1,657	13.4%
Total with Gender Data	**8,838**		**1,593**		**1,900**		**12,331**	
Unknown	170		0		0		170	
Total	**9,008**		**1,593**		**1,900**		**12,501**	

Table 3. Ethnicity of Bachelor's Recipients								
	CS		CE		I		Total	
Nonresident Alien	584	8.4%	99	7.1%	73	4.8%	756	7.6%
American Indian or Alaska Native	27	0.4%	6	0.4%	13	0.9%	46	0.5%
Asian	1,034	14.8%	250	17.9%	173	11.4%	1,457	14.7%
Black or African-American	236	3.4%	57	4.1%	120	7.9%	413	4.2%
Native Hawaiian or Pacific Is-lander	20	0.3%	3	0.2%	3	0.2%	26	0.3%
White	4,650	66.5%	901	64.6%	1,024	67.2%	6,575	66.4%
Multiracial, not Hispanic	65	0.9%	13	0.9%	1	0.1%	79	0.8%
Resident Hispanic, any race	373	5.3%	65	4.7%	116	7.6%	554	5.6%
Total with Ethnicity Data	**6,989**		**1,394**		**1,523**		**9,906**	
Resident, race/ethnicity unknown	455		96		119		670	
Residency unknown	1,564		103		258		1,925	
Total	**9,008**		**1,593**		**1,900**		**12,501**	

Master's Degree Production and Enrollments

Master's degree production in CS was flat in 2009-10 with 6,851 graduates. 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-school 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 Asians are combined.

There is an increase in the number of new master's students in CS programs this year. Changes in new enrollment among CE and I school programs appear consistent with changes in the number of departments in these categories that reported.

Table 4. Master's Degree Recipients for 2009-2010 by Department Type								
	CS		**CE**		**I**		**Total**	
Total US CS	6,307	92.1%	475	62.1%	625	32.5%	7,407	77.6%
US CE	0	0.0%	204	26.7%	14	0.7%	218	2.3%
US Information	0	0.0%	0	0.0%	1,287	66.8%	1,287	13.5%
Canadian	544	7.9%	86	11.2%	20	0.0%	630	6.6%
Total	**6,851**		**765**		**1,926**		**9,542**	

Table 5. Gender of Master's Recipients								
	CS		**CE**		**I**		**Total**	
Male	5,381	79.0%	594	77.6%	945	49.1%	6,920	72.8%
Female	1,434	21.0%	171	22.4%	981	50.9%	2,586	27.2%
Total with Gender Data	**6,815**		**765**		**1,926**		**9,506**	
Unknown	36		0		0		36	
Total	**6,851**		**765**		**1,926**		**9,542**	

Table 6. Ethnicity of Master's Recipients								
	CS		CE		I		Total	
Nonresident Alien	3,585	59.0%	381	57.0%	380	23.1%	4,346	51.8%
American Indian or Alaska Native	9	0.1%	1	0.1%	13	0.8%	23	0.3%
Asian	646	10.6%	88	13.2%	167	10.2%	901	10.7%
Black or African-American	78	1.3%	10	1.5%	75	4.6%	163	1.9%
Native Hawaiian or Pacific Islander	14	0.2%	1	0.1%	4	0.2%	19	0.2%
White	1,620	26.7%	164	24.6%	927	56.4%	2,711	32.3%
Multiracial, not Hispanic	15	0.2%	0	0.0%	10	0.6%	25	0.3%
Resident Hispanic, any race	110	1.8%	23	3.4%	68	4.1%	201	2.4%
Total with Ethnicity Data	**6,077**		**668**		**1,644**		**8,389**	
Resident, race/ethnicity unknown	267		89		184		540	
Residency unknown	507		8		98		613	
Total	**6,851**		**765**		**1,926**		**9,542**	

Ph.D. Degree Production, Enrollments and Employment

Total Ph.D. production in computing programs held steady in 2009-10, with 1,772 degrees granted. Computer science degree production also was relatively flat (1,501 vs. 1,468 last year). This follows a drop in production last year. A smaller fraction of this year's computer science graduates were women (18.8 per cent vs. 20.8 per cent last year) while a larger fraction of this year's I school graduates were women (40.2 per cent vs. 36.1 per cent last year). A larger fraction of this year's graduates were White (36.7 per cent vs. 33.3 per cent last year). This change was largest at I schools, where there was a 15 per cent larger fraction of Whites and a 10 per cent smaller fraction of Non-resident Aliens, but again, this may reflect differences in the reporting departments.

Figure 3. Total Ph.D. Production (CS & CE, US and Canada)
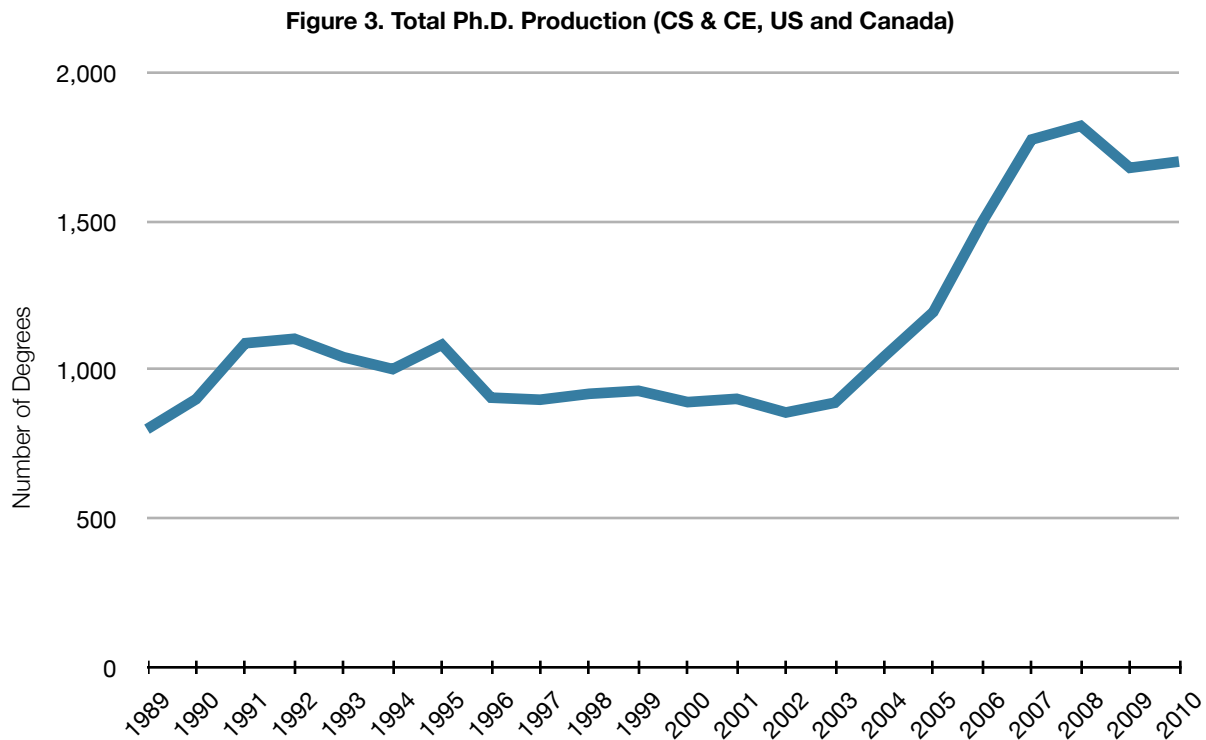
The number of new Ph.D. students overall is about the same as last year (2,962 this year vs 2,995 last year), for the second year in a row. The number of new students in computer engineering programs declined, however. This year, there was a decline in the proportion of new doctoral students from outside North America, from 59.1 percent last year to 56.8 per cent this year.

However, this still is greater than the 54 per cent from outside North America two years ago. Total enrollment in computer science doctoral programs is comparable to that of last year, after accounting for the increased number of departments reporting this year.

Table 7. New PhD Students from Outside North America						
	CS	CE	I	Total New Outside	Total New	% Outside North America
Total US CS	1,313	87	35	**1,435**	2,560	56.1%
US CE	0	69	7	**76**	98	77.6%
US Information	0	0	33	**33**	104	31.7%
Canadian	135	4	0	**139**	200	69.5%
Total	**1,448**	**160**	**75**	**1,683**	**2,962**	**56.8%**
Total New	2,561	216	185	2,962		
% Outside	56.5%	74.1%	40.5%	56.8%		

More doctoral graduates specialized in artificial intelligence, informatics: biomedical/other science, operating systems, scientific computing and social computing this year than did so last year, 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.

Only 8.2 per cent of the 2009-10 graduates went into tenure-track positions at North American Ph.D.-granting departments, down from 10.4 per cent the previous year. Also, only 44.7 per cent of doctoral graduates went into industry, compared with 47.1 percent of 2008-09 graduates. There was an increased fraction of Ph.D. graduates who took post doctoral positions at North American Ph.D.-granting departments (19.5 percent vs. 15.0 per cent the previous year; just two years ago this fraction was 10 per cent). These statistics clearly reflect the U.S. economic situation during last year's hiring period. The proportion of new doctoral graduates who were not employed remained at about 1 percent.

Table 10. PhD Program Total Enrollment by Gender							
	CS		CE		I		Total	
Male	10,290	81.2%	1,141	82.8%	589	59.3%	12,020	79.9%
Female	2,300	18.2%	237	17.2%	404	40.6%	2,941	19.6%
Total have Gender Data for	**12,590**		**1,378**		**993**		**14,961**	
Unknown	76		0		1		77	
Total	**12,666**		**1,378**		**994**		**15,038**	

Table 11. PhD Program Total Enrollment by Ethnicity							
	CS		CE		I		Total	
Nonresident Alien	6,395	50.5%	866	62.8%	403	40.5%	7,664	51.0%
American Indian or Alaska Native	18	0.1%	1	0.1%	5	0.5%	24	0.2%
Asian	926	7.3%	97	7.0%	88	8.9%	1,111	7.4%
Black or African-American	245	1.9%	23	1.7%	37	3.7%	305	2.0%
Native Hawaiian or Pacific Islander	35	0.3%	1	0.1%	6	0.6%	42	0.3%
White	3,745	29.6%	263	19.1%	368	37.0%	4,376	29.1%
Multiracial, not Hispanic	13	0.1%	1	0.1%	4	0.4%	18	0.1%
Resident Hispanic, any race	171	1.4%	19	1.4%	19	1.9%	209	1.4%
Total have Ethnicity Data for	**11,548**		**1,271**		**930**		**13,749**	
Resident, race/ethnicity unknown	474		90		59		623	
Residency unknown	644		17		5		666	
Total	**12,666**		**1,378**		**994**		**15,038**	

Table 12. Gender of PhD Recipients by Type of Degree								
	CS		CE		I		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**	

Table 13. Ethnicity of PhD Recipients by Type of Degree								
	CS		CE		I		Total	
Nonresident Alien	613	45.8%	108	63.2%	33	30.0%	754	46.5%
American Indian or Alaska Native	3	0.2%	0	0.0%	1	0.9%	4	0.2%
Asian	169	12.6%	23	13.5%	15	13.6%	207	12.8%
Black or African-American	17	1.3%	2	1.2%	2	1.8%	21	1.3%
Native Hawaiian or Pacific Is-lander	7	0.5%	0	0.0%	0	0.0%	7	0.4%
White	503	37.6%	35	20.5%	56	50.9%	594	36.7%
Multiracial, not Hispanic	5	0.4%	0	0.0%	0	0.0%	5	0.3%
Resident Hispanic, any race	22	1.6%	3	1.8%	3	2.7%	28	1.7%
Total with Ethnicity Data	**1,339**		**171**		**110**		**1,620**	92.1%
Resident, race/ethnicity unknown	26		6		3		35	
Residency unknown	116		0		1		117	
Total	**1,481**		**177**		**114**		**1,772**	

Table 14. Employment of New PhD Recipients By Specialty

	Artificial Intelligence	Computer-Supported Cooperative Work	Databases / Information Retrieval	Graphics/Visualization	Hardware/Architecture	Human-Computer Interaction	High-Performance Computing	Informatics: Biomedical/Other Science	Information Assurance/Security	Information Science	Information Systems	Networks	Operating Systems	Programming Languages/Compilers	Robotics/Vision	Scientific/Numerical Computing	Social Computing/Social Informatics	Software Engineering	Theory and Algorithms	Other	Total	
North American PhD Granting Depts.																						
Tenure-track	15	0	7	8	5	7	2	3	6	5	6	6	9	4	3	0	2	7	8	21	124	8.2%
Researcher	12	0	4	1	1	1	3	4	1	0	2	1	5	1	3	2	1	2	1	6	51	3.4%
Postdoc	39	4	9	15	3	10	4	34	10	3	6	19	8	13	14	4	4	14	33	48	294	19.5%
Teaching Faculty	5	2	3	4	1	1	0	1	0	0	0	0	2	2	0	1	1	5	2	7	37	2.5%
North American, Other Academic																						
Other CS/CE/I Dept.	1	0	0	3	0	0	0	3	2	1	2	9	1	2	2	1	1	3	0	5	36	2.4%
Non-CS/CE/I Dept.																						
North American, Non-Academic																						
Industry	76	6	57	35	47	17	5	14	27	5	15	61	22	28	27	15	7	72	30	106	672	44.7%
Government	6	0	2	1	2	4	5	5	2	1	1	2	3	0	4	5	2	5	2	12	64	4.3%
Self-Employed	2	1	0	2	1	0	0	0	3	1	0	3	1	0	2	0	0	2	1	0	19	1.3%
Unemployed	0	0	1	2	0	0	2	0	0	0	0	1	0	1	0	0	3	1	2	3	16	1.1%
Other	3	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	1	4	13	0.9%
Total Inside North America	159	13	84	71	61	41	21	65	51	16	32	102	52	51	55	28	21	111	80	212	1326	88.2%

Table 14. Employment of New PhD Recipients By Specialty (Continued)

	Artificial Intelligence	Computer-Supported Cooperative Work	Databases / Information Retrieval	Graphics/Visualization	Hardware/Architecture	Human-Computer Interaction	High-Performance Computing	Informatics: Biomedical/ Other Science	Information Assurance/Security	Information Science	Information Systems	Networks	Operating Systems	Programming Languages/ Compilers	Robotics/Vision	Scientific/ Numerical Computing	Social Computing/ Social Informatics	Software Engineering	Theory and Algorithms	Other	Total	
Outside North America																						
Tenure-Track in PhD Granting	3	0	2	1	3	0	1	0	4	0	2	12	2	1	3	0	0	2	9	6	51	3.4%
Researcher in PhD	1	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	0	1	1	8	0.5%
Postdoc in PhD	2	3	3	3	1	0	0	2	1	0	0	3	0	2	3	1	0	3	9	5	41	2.7%
Teaching in PhD	2	0	2	0	0	0	1	1	0	1	0	1	1	0	0	0	0	0	0	2	9	0.6%
Other Academic	0	0	0	0	0	0	0	0	2	0	0	6	2	0	0	0	1	1	0	0	11	0.7%
Industry	4	2	0	5	3	2	0	0	2	0	2	10	2	2	1	1	1	1	1	3	42	2.8%
Government	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	2	0	0	3	10	0.7%
Other	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	6	0.4%
Total Outside NA	12	5	8	10	8	3	3	3	10	1	4	37	5	6	8	3	3	8	20	21	178	11.8%
Total with Employment Data, Inside North America plus Outside North America	171	18	92	81	69	44	24	68	61	17	36	139	57	57	63	31	24	119	100	233	1504	
Employment Type & Location Unknown	10	1	7	6	9	5	5	7	9	3	0	11	2	8	2	2	4	7	10	160	268	
Total	181	19	99	87	78	49	29	75	70	20	36	150	59	65	65	33	28	126	110	393	1772	

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 faculty job marked 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.

Participating Schools

US CS departments that responded to the survey include: Arizona State University, Auburn, Boston University, Brandeis, Brown, Carnegie Mellon, Case Western Reserve, City University of New York Graduate Center, College of William and Mary, Colorado School of Mines, Colorado State, Columbia, Cornell, Dartmouth, DePaul, Drexel, Duke, Florida Institute of Technology, Florida International, Florida State, George Mason, George Washington, Georgia Institute of Technology, Georgia State, Harvard, Illinois Institute of Technology, Indiana, Iowa State, Johns Hopkins, Kansas State, Kent State, Lehigh, Louisiana State, Massachusetts Institute of Technology, Michigan State, Michigan Technological, Mississippi State, Montana State, Naval Postgraduate School, New Mexico Institute of Mining and Technology, New Mexico State, New York University, North Carolina State, North Dakota State, Northeastern, Northwestern, Oakland, Ohio, Ohio State, Old Dominion, Oregon State, Pace, Pennsylvania State, Polytechnic, Portland State, Princeton, Purdue, Rensselaer Polytechnic, Rice, Rochester Institute of Technology, Rutgers, Southern Illinois University (Carbondale), Stanford, State University of New York (Stony Brook), Stevens Institute of Technology, Syracuse, Texas A&M, Texas Tech, Toyota Technological Institute (Chicago), Tufts, Vanderbilt, Virginia Tech, Washington State, Washington (St. Louis), Wayne State, Western Michigan, Worcester Polytechnic, Wright State, and Yale.

University of: Alabama (Birmingham, Huntsville, and Tuscaloosa), Albany, Arizona, Arkansas (Fayetteville), Buffalo, California (at Berkeley, Davis, Irvine, Los Angeles, Riverside, San Diego, Santa Barbara, and Santa Cruz), Central Florida, Chicago, Cincinnati, Colorado (Boulder and Colorado Springs), Connecticut, Delaware, Florida, Georgia, Idaho, Illinois (Chicago and Urbana-Champaign), Iowa, Kansas, Kentucky, Louisiana (Lafayette), Maine, Maryland (Baltimore Co. and College Park), Massachusetts (at Amherst, Boston, and Lowell), Michigan, Minnesota, Mississippi, Missouri (at Columbia), Nebraska (Lincoln), Nevada (Las Vegas and Reno), New Hampshire, New Mexico, North Carolina (Chapel Hill and Charlotte), North Texas, Notre Dame, Oklahoma, Oregon, Pennsylvania, Pittsburgh, Rochester, South Carolina, South Florida, Southern California, Southern Mississippi, Tennessee (Knoxville), Texas (at Arlington, Austin, Dallas, El Paso, and San Antonio), Tulsa, Utah, Virginia, Washington, Wisconsin (Madison), Wyoming.

Computer Engineering departments participating in the survey this year include: Boston University, Brigham Young, Clemson, Florida Institute of Technology, Iowa State, Northeastern, Old

Dominion, Princeton, Santa Clara University, Virginia Tech, and the Universities of California (Santa Cruz), Iowa, New Mexico, and Southern California.

Canadian departments participating in the survey include: Concordia, Dalhousie, McGill, Memorial, Queen's, Simon Fraser, and York Universities, and the Universities of: Alberta, British Columbia, Calgary, Manitoba, Montreal, Ottawa, Saskatchewan, Toronto, Victoria, Waterloo, and Western Ontario.

Information departments participating in the survey include: Cornell, Drexel, Indiana, Penn State, and Syracuse Universities, and the Universites of: California (Berkeley, Irvine, Los Angeles, and Santa Cruz), Illinois (Urbana-Champaign), Maryland (College Park and Baltimore County), Michigan, Pittsburgh, Texas (Austin), and Washington.

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