Computing Degree and Enrollment Trends

From the 2008-2009 CRA Taulbee Survey

Undergraduate Enrollment in Computer Science Trends Higher

By Stuart Zweben

Executive Summary

Summary of Results

- The number of new students majoring in computer science increased 8.5 percent over the previous year. The total number of majors increased 5.5 percent, yielding a two-year increase of 14 percent. Computer science graduation rates should increase in two to three years as these new students graduate.

- Bachelor's degree graduation production in computer science continued to decline, a consequence of decreased enrollments in the latter half of the previous decade.

- Total Ph.D. graduation production decreased 6.9 percent to 1,747 degrees – this was the first decrease in seven years.

- Only 11.2 percent of bachelor's graduates in computer science were women. The number of minority students graduating in computer science was 10.1 percent, a decline of 1.6 percentage points from last year.

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 39th annual CRA Taulbee Survey. The full report, which also includes information about faculty size, demographics and salaries, graduate student support, research expenditures, teaching loads and space, will be available in May 2010 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, 2010 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 (2008-2009). Data for new students in all categories refer to the current academic year (2009-2010).

For this report, we surveyed a total of 265 Ph.D-granting departments. Of the departments surveyed, 188 returned their survey forms, for a response rate of 71 percent. This is similar to last year's 73 percent. There is a low response rate from the information departments (60 percent – their participation in the survey began one year ago) and Canadian departments (53 percent), and a typical low response rate (40 percent) from computer engineering departments. We had a good response rate from U.S. computer science departments (147 of 184, or 80 percent).

Departments that responded to the survey were sent preliminary results about faculty salaries in December 2009; these results included additional distributional information not contained in this

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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 IT 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.

report. The CRA Board views this as a benefit of participating in the survey. We thank all respondents who completed this year's questionnaire. Departments that participated are listed at the end of this article.
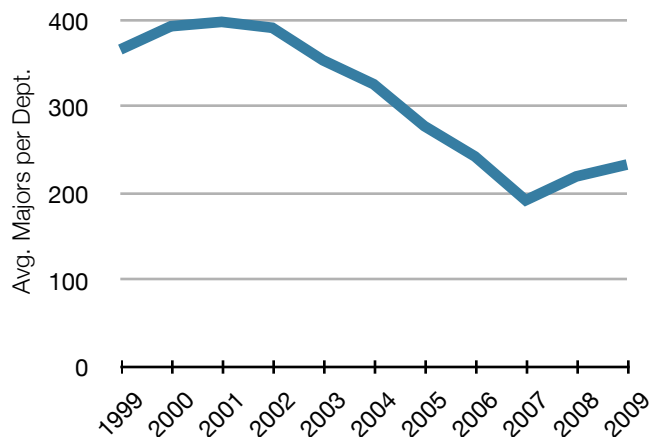
Table 1. Number of Respondents to the Taulbee Survey					
Year	US CS Depts.	US CE Depts.	Canadian	US I-Schools	Total
1995	110/133 (83%)	9/13 (69%)	11/16 (69%)		130/162 (80%)
1996	98/131 (75%)	8/13 (62%)	9/16 (56%)		115/160 (72%)
1997	111/133 (83%)	6/13 (46%)	13/17 (76%)		130/163 (80%)
1998	122/145 (84%)	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%)

Bachelor's Degree Production and Enrollments

The number of new students in U.S. computer science programs continues to increase. There was an 8.5 percent increase in the number of majors among U.S. computer science departments and a 9 percent increase in the number of new pre-majors (students who are pursuing a curriculum for the major in computer science, but have not yet declared their official major). Total enrollment among majors and pre-majors in U.S. computer science departments increased 4.2 percent, and if only majors are considered, the increase is 5.5 percent over last year. The additional enrollments over the last two years have resulted in a 14 percent increase in the number of majors among U.S. computer science departments since 2007, and should result in an increased number of bachelor's degrees produced in these departments within another two to three years.

Figure 1. BS Total Enrollment - Avg. Majors per US CS Dept.

Overall bachelor's degree production (Figure 2) in 2009 declined 12 percent from 2008. Bachelor's degree production in U.S. computer science departments also decreased 12 percent. These decreases are a legacy of the decline in enrollments experienced earlier this decade and also may be due in part to the decreased number of departments reporting.

In Canada, the number of new computer science majors increased by 8 percent, but the total number of computer science majors declined by over 7 percent. Since there are relatively few Canadian departments reporting, these trends are

Figure 2. BS Production (CS & CE)
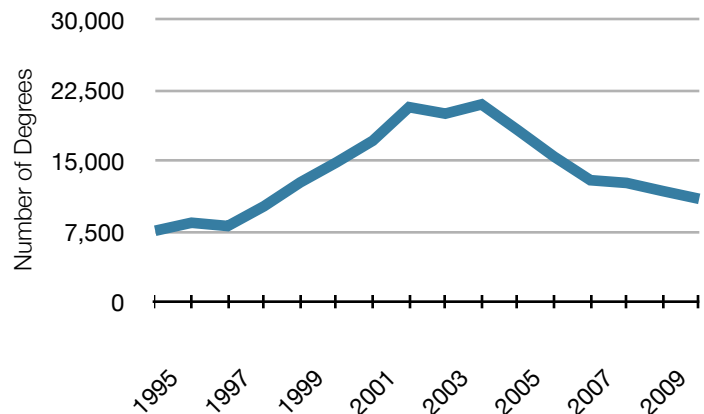
significantly influenced by the specific departments reporting. However, since the number of new computer science majors in Canada increased for the second straight year, it appears that Canadian computer science departments are headed for increased bachelor's degree production as well.

Because of the newness of the I-school data, it is not appropriate to try to discern any enrollment patterns at this time. Computer engineering enrollment data appears comparable to last year in aggregate, although there are more majors and fewer pre-majors this year.

Gender and ethnicity diversity continues to remain poor. Only 11.3 percent of bachelor's graduates in computer science were women (Table 2). The number of minority students graduating in computer science was 10.1 percent, a decline of 1.6 percentage points from last year (Table 3).

Table 2. Gender of Bachelor's Recipients								
	CS		CE		I		Total	
Male	7,031	88.7%	1,394	91.3%	1,291	86.9%	9,716	88.9%
Female	892	11.3%	132	8.7%	194	13.1%	1,218	11.1%
Total with Gender Data	7,923		1,526		1,485		10,934	
Unknown	177		17		143		337	
Total	8,100		1,543		1,628		11,271	

Table 3. Ethnicity of Bachelor's Recipients								
	CS		CE		I		Total	
Nonresident Alien	377	6.2%	102	8.2%	25	2.0%	504	5.9%
American Indian or Alaska Native	16	0.3%	2	0.2%	3	0.2%	21	0.2%
Asian	878	14.4%	235	18.8%	137	11.2%	1,250	14.6%
Black or African-American	207	3.4%	62	5.0%	105	8.6%	374	4.4%
Native Hawaiian or Pacific Is-lander	38	0.6%	7	0.6%	1	0.1%	46	0.5%
White	4,198	68.9%	794	63.6%	865	70.7%	5,857	68.4%
Multiracial, not Hispanic	24	0.4%	2	0.2%	1	0.1%	27	0.3%
Resident Hispanic, any race	365	5.8%	45	3.6%	87	7.1%	487	5.7%
Total with Ethnicity Data	6,093		1,249		1,224		8,566	
Resident, race/ethnicity unknown	781		161		102		1,044	
Residency unknown	1,226		133		302		1,661	
Total	8,100		1,543		1,628		11,271	

Master's Degree Production and Enrollments

At the master's degree level, production declined 5.2 percent in 2008-09, from 9,998 to 9,483 (Table 4). The decline in computer science departments in master's degree production was 6.7 percent. The decline is consistent with last year's observation of lower enrollments in master's degree programs. Master's degree production also declined among information school departments, but increased in computer engineering departments.

Table 4. Master's Degree Candidates for 2009-2010 by Department Type and Rank								
Department, Rank	CS		CE		I		Total	
US CS 1-12	662	9.6%	63	6.8%	0	0.0%	725	7.6%
US CS 13-24	1,052	15.3%	1	0.1%	0	0.0%	1,053	11.1%
US CS 25-36	579	8.4%	5	0.5%	77	4.6%	661	7.0%
US CS Other	4,145	60.2%	577	62.5%	528	31.6%	5,250	55.4%
Total US CS	**6,438**	**93.4%**	**646**	**70.0%**	**605**	**36.2%**	**7,689**	**81.1%**
US CE	0	0.0%	187	20.3%	0	0.0%	187	2.0%
US Information	0	0.0%	0	0.0%	1,064	63.8%	1,064	11.2%
Canadian	453	6.6%	90	9.8%	0	0.0%	543	5.7%
Total	**6,891**		**923**		**1,669**		**9,483**	

There was less than a one percent change in the proportion of female graduates among master's recipients in 2008-09 (22.1 percent vs. 21.2 percent the previous year) (Table 5). In fact, for the past few years, the gender balance among master's recipients has remained steady. A higher fraction of the recipients were non-resident aliens in 2008-09 (62.2 percent vs. 55.8 percent the previous year) and this continues a trend toward an larger international graduating class, and correspondingly fewer white graduates, among master's recipients (Table 6). Other ethnicity characteristics showed little change.

The number of new master's students overall held steady this year at 7,593, which is a slight increase (less than two percent) in the number of new students in computer science programs. This suggests that future master's degree production will not change much in the short term.

Table 5. Gender of Master's Recipients								
	CS		CE		I		Total	
Male	5,364	77.9%	732	79.3%	789	47.3%	6,885	72.6%
Female	1,522	22.1%	191	20.7%	880	52.7%	2,593	27.4%
Total with Gender Data	**6,886**		**923**		**1,669**		**9,478**	
Unknown	5		0		0		5	
Total	**6,891**		**923**		**1,669**		**9,483**	

Table 6. Ethnicity of Master's Recipients								
	CS		CE		I		Total	
Nonresident Alien	3,858	62.2%	508	62.8%	275	19.7%	4,641	55.2%
American Indian or Alaska Native	15	0.2%	6	0.7%	6	0.4%	27	0.3%
Asian	550	8.9%	105	13.0%	151	10.8%	806	9.6%
Black or African-American	96	1.5%	15	1.9%	86	6.2%	197	2.3%
Native Hawaiian or Pacific Islander	24	0.4%	2	0.2%	5	0.4%	31	0.4%
White	1,561	25.2%	150	18.5%	796	57.0%	2,507	29.8%
Multiracial, not Hispanic	2	0.0%	4	0.5%	10	0.7%	16	0.2%
Resident Hispanic, any race	97	1.6%	19	2.3%	68	4.9%	184	2.2%
Total with Ethnicity Data	**6,203**		**809**		**1,397**		**8,409**	
Resident, race/ethnicity unknown	280		83		168		531	
Residency unknown	408		31		104		543	
Total	**6,891**		**923**		**1,669**		**9,483**	

Ph.D. Degree Production, Enrollments and Employment

For the first time since 2001-02, Ph.D. production in computing programs reported by the Taulbee Survey departments declined in 2008-09 (Figure 3). Total Ph.D. production is down 6.9 percent, to 1,747 degrees. If the information Ph.D.s are eliminated from consideration, the decline is 8.3 percent, and if computer science Ph.D.s only are considered, the decline is 7.8 percent.

Figure 3. Total Ph.D. Production (CS & CE, US and Canada)
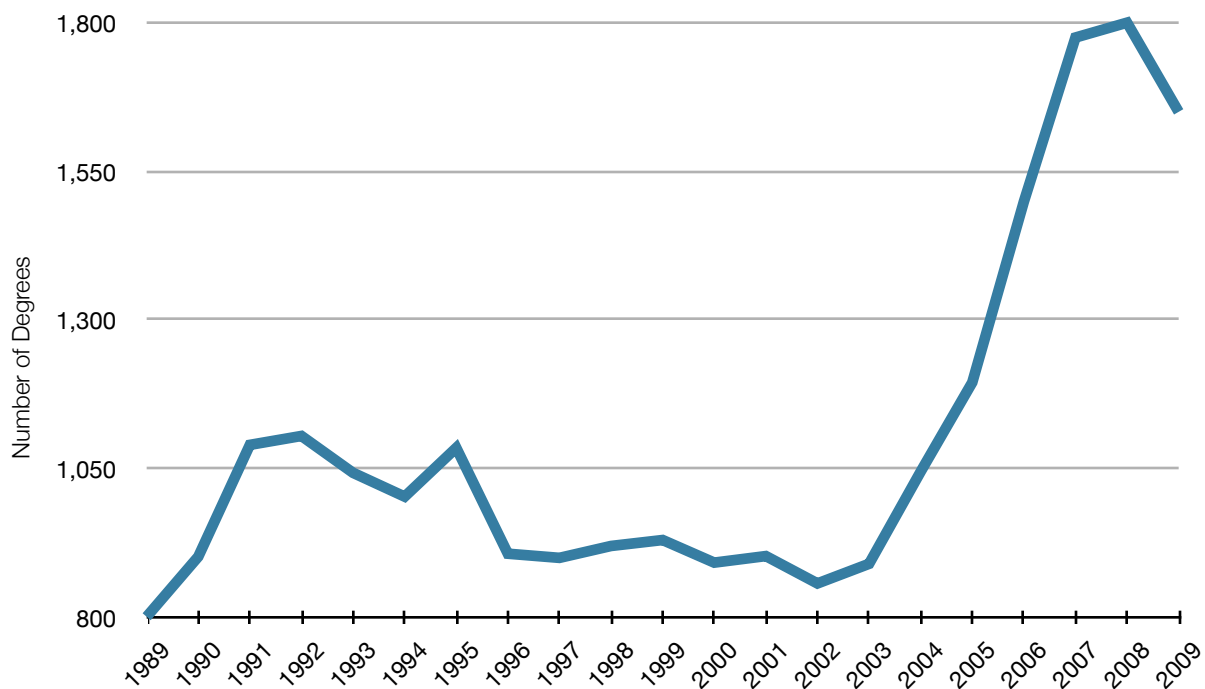
This decline was not surprising. Declining numbers of new students in doctoral programs, beginning in 2002-03 (following employment recovery from the "dot com" bust and post-9/11 increased immigration requirements on foreign students) and noted in previous Taulbee Surveys, were an early indicator of this decline in Ph.D. production. Economic conditions may have exacerbated the decline, as some students choose to take longer to graduate when the job market is weak. It is likely that Ph.D. production will have some further decline over the next couple of

years. However, recent positive trends in new doctoral student enrollment should lead to a future rise in Ph.D. production.

The number of new Ph.D. students overall is about the same as last year (2,995 this year versus 3,017 last year). If only computer science doctoral students are considered, there is a slight decline, but that is due to the decline from Canadian schools, whose data are more volatile due to the relatively small number of departments reporting. Perhaps of more significant interest is the large increase in the number of new doctoral students from outside North America, up from 54 percent last year to 59.1 percent this year (Table 7). A similar increase is observed when only computer science doctoral students are considered.

Table 7. New PhD Students from Outside North America						
Department, Rank	CS	CE	I	Total New Outside	Total New	% Outside North America
US CS 1-12	221	0	1	**222**	432	51.4%
US CS 13-24	175	2	0	**177**	308	57.5%
US CS 25-36	205	6	17	**228**	339	67.3%
US CS Other	835	114	8	**957**	1,550	61.7%
Total US CS	1,436	122	26	**1,584**	2,629	60.3%
US CE	0	54	2	**56**	91	61.5%
US Information	0	0	36	**36**	87	41.4%
Canadian	86	7	0	**93**	188	49.5%
Total	**1,522**	**183**	**64**	**1,769**	**2,995**	**59.1%**
Total New	2,551	294	150	2,995		
% Outside	59.7%	62.2%	42.7%	59.1%		

Total enrollment in computer science doctoral programs is nearly the same as last year, while the more volatile doctoral enrollment data in computer engineering and information programs shows increased enrollments. Gender and ethnicity of enrolled doctoral students also is similar to that of last year (Table 10 and 11).

More doctoral graduates specialized in architecture, information science and information assurance/security this year than did so last year, while a smaller proportion specialized in databases/information retrieval, software engineering, operating systems and theory/algorithms

(Table 10). There have been few long-term trends in these specialization data over the years, so a one-year difference should not be construed as necessarily indicative of any shift in emphasis.

Table 10. PhD Program Total Enrollment by Gender							
	CS		CE		I		Total	
Male	10,090	81.6%	1,257	83.4%	520	61.3%	11,867	80.6%
Female	2,280	18.4%	250	16.6%	328	38.7%	2,856	19.4%
Total have Gender Data for	12,370		1,507		848		14,725	
Unknown	11		0		0		11	
Total	12,381		1,507		848		14,736	

Table 11. PhD Program Total Enrollment by Ethnicity								
	CS		CE		I		Total	
Nonresident Alien	5,795	53.5%	815	61.0%	401	51.1%	7,011	54.1%
American Indian or Alaska Native	21	0.2%	5	0.4%	3	0.4%	29	0.2%
Asian	877	8.1%	172	12.9%	53	6.8%	1,102	8.5%
Black or African-American	179	1.7%	26	1.9%	29	3.7%	234	1.8%
Native Hawaiian or Pacific Islander	58	0.5%	1	0.1%	2	0.3%	61	0.5%
White	3,704	34.2%	284	21.2%	280	35.7%	4,268	33.0%
Multiracial, not Hispanic	27	0.2%	1	0.1%	1	0.1%	29	0.2%
Resident Hispanic, any race	169	1.6%	33	2.5%	16	2.0%	218	1.7%
Total have Ethnicity Data for	10,830		1,337		785		12,952	
Resident, race/ethnicity unknown	673		159		47		879	
Residency unknown	878		11		16		905	
Total	12,381		1,507		848		14,736	

Employment of new doctoral graduates did undergo a shift, largely due to economic conditions. Whereas 56.6 percent of 2007-08 doctoral graduates went into industry, only 47.1 percent of 2008-09 graduates did so. With the availability of tenure-track jobs in academia at levels similar to those of the previous year, greater percentages of graduates went into jobs as researchers and

post-doctoral graduates. The new NSF Computing Innovation Fellows program had a lot to do with supporting this shift.

The proportion of new doctoral graduates who were not employed remained at about 1 percent, and the percentage taking employment outside of North America was 9.9 percent vs. 9.2 percent in 2007-08.

Table 12. Gender of PhD Recipients by Type of Degree								
	CS		CE		I		Total	
Male	1,126	79.2%	142	84.0%	62	63.9%	1,330	78.8%
Female	295	20.8%	27	16.0%	35	36.1%	357	21.2%
Total known Gender	**1,421**		**169**		**97**		**1,687**	
Unknown	52		8		0		60	
Total	**1,473**		**177**		**97**		**1,747**	

Table 13. Ethnicity of PhD Recipients by Type of Degree								
	CS		CE		I		Total	
Nonresident Alien	650	48.3%	108	67.5%	37	40.2%	795	49.8%
American Indian or Alaska Native	1	0.15	0	0.0%	0	0.0%	1	0.1%
Asian	181	13.5%	10	6.3%	11	12.0%	202	12.6%
Black or African-American	17	1.3%	2	1.3%	7	7.6%	26	1.6%
Native Hawaiian or Pacific Islander	9	0.7%	0	0.0%	0	0.0%	9	0.6%
White	462	34.3%	37	23.1%	33	35.9%	532	33.3%
Multiracial, not Hispanic	6	0.4%	0	0.0%	1	1.1%	7	0.4%
Resident Hispanic, any race	19	1.4%	3	1.9%	3	3.3%	25	1.6%
Total with Ethnicity Data	**1,345**		**160**		**92**		**1,597**	92.5%
Resident, race/ethnicity unknown	49		2		3		54	
Residency unknown	79		15		2		96	
Total	**1,473**		**177**		**97**		**1,747**	

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	Total
North American PhD Granting Depts.																						
Tenure-track	10	0	7	8	4	12	2	7	7	6	7	6	8	8	8	3	2	13	4	25	147	10.4%
Researcher	5	0	3	3	3	5	3	1	1	2	1	4	5	14	1	3	0	2	2	20	65	4.6%
Postdoc	22	1	7	14	3	14	7	16	7	2	4	13	5	14	18	4	3	8	22	27	211	15.0%
Teaching Faculty	5	0	1	1	4	1	0	1	2	1	0	2	0	1	2	1	0	3	2	7	34	2.4%
North American, Other Academic																						
Other CS/CE/I Dept.	9	0	0	3	2	3	1	4	5	0	0	6	0	1	2	1	0	4	4	2	47	3.3%
Non–CS/CE/I Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
North American, Non-Academic																						
Industry	75	8	64	51	50	15	15	16	22	10	12	76	21	22	25	7	2	65	26	82	664	47.1%
Government	4	0	0	1	2	1	6	3	8	1	0	3	0	2	0	0	2	3	3	15	54	3.8%
Self-Employed	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	1	1	3	3	12	0.9%
Unemployed	2	0	1	0	0	1	2	0	2	0	1	2	0	1	0	0	0	0	0	3	16	1.1%
Other	4	0	2	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	7	21	1.5%
Total Inside North America	136	9	85	81	69	53	37	49	55	24	26	113	39	51	57	19	10	100	67	191	1271	90.1%

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	1	0	3	1	0	3	1	0	3	1	0	3	0	0	1	0	0	2	4	6	29	2.1%
Researcher in PhD																						
Postdoc in PhD	2	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	7	0.5%
Teaching in PhD	3	0	1	2	1	1	0	1	5	0	1	2	1	3	3	0	0	2	5	4	35	2.5%
Other Academic	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	6	0.4%
Industry	0	0	2	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	2	0	8	0.6%
Government	4	0	4	2	3	2	1	1	2	1	0	12	1	1	1	1	0	4	1	6	47	3.3%
Other	0	0	1	0	0	0	0	0	0	0	0	2	0	1	0	0	0	1	0	1	7	0.5%
Total Outside NA	**11**	**0**	**12**	**5**	**4**	**7**	**3**	**2**	**11**	**2**	**2**	**23**	**2**	**6**	**5**	**1**	**0**	**11**	**12**	**21**	**140**	**9.9%**
Total with Employment Data, Inside North America plus Outside North America	147	9	97	86	73	60	40	51	66	26	28	136	41	57	62	20	10	111	79	212	1411	14
Employment Type & Location Unknown	18	1	18	10	7	5	2	8	10	2	9	22	3	6	3	3	2	6	15	186	336	
Total	**165**	**10**	**115**	**96**	**80**	**65**	**42**	**59**	**76**	**28**	**37**	**158**	**44**	**63**	**65**	**23**	**12**	**117**	**94**	**398**	**1747**	

Concluding Observations

The continued increased student interest in undergraduate computing programs is heartening for our profession and is consistent with the interests of governments in nurturing Science, Technology, Engineering and Mathematics (STEM) disciplines. While we have increased worldwide participation in our graduate programs, it will be helpful to also increase interest in these graduate programs among domestic graduates of our bachelor's programs. As economic recovery takes hold, it should be possible to sustain employment of the current high numbers of doctoral graduates and soon-to-be-realized increased numbers of bachelor's graduates.

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).[3] New NRC rankings are anticipated later in 2010, and future Taulbee reports may be modified as a result.

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.

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 ranked 25-36 are: University of Chicago, Purdue, Rutgers, Duke, University of North Carolina (Chapel Hill), University of Rochester, State University of New York (Stony Brook), Georgia Institute of Technology, University of Arizona, University of California (Irvine), University of Virginia, and Indiana. 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, Binghamton, Boston University, Case Western Reserve, City University of New York Graduate Center, Clarkson, College of William and Mary, Colorado School of Mines, Colorado State, Dartmouth, DePaul, Drexel, Florida Institute of Technology, Florida International, Florida State, George Mason, George Washington, Georgia State,

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[3] See http://www.cra.org/statistics/nrcstudy2/home.html

[4] 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.

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 Jersey Institute of Technology, New Mexico Institute of Mining and Technology, New Mexico State, North Carolina State, Northeastern, Northwestern, Oakland, 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, Toyota Technological Institute (Chicago), Tufts, Vanderbilt, Virginia Tech, Washington State, Washington (St. Louis), Wayne State, Worcester Polytechnic, and Wright State.

University of: Alabama (Birmingham and Tuscaloosa), Albany, Arkansas (Fayetteville), Buffalo, California (at Davis, Irving, Riverside, and Santa Cruz), Cincinnati, Colorado (Boulder), Connecticut, Delaware, Florida, Georgia, Idaho, Illinois (Chicago), Iowa, Kansas, Kentucky, Louisiana (Lafayette), Maine, Maryland (Baltimore Co.), Massachusetts (at Boston and Lowell), Minnesota, Mississippi, Missouri (at Columbia), Nebraska (Lincoln), Nevada (Las Vegas and Reno), New Hampshire, New Mexico, North Carolina (Charlotte), North Texas, Notre Dame, Oklahoma, Oregon, Pittsburgh, South Carolina, South Florida, Southern Mississippi, Tennessee (Knoxville), Texas (at Arlington, Dallas, El Paso, and San Antonio), Tulsa, Utah, and Wyoming.

Computer Engineering departments participating in the survey this year include: Boston University, Florida Institute of Technology, Iowa State, Northeastern, Princeton, Santa Clara University, Virginia Tech, and the Universities of California (Santa Cruz), Houston, Iowa, New Mexico, Rochester, and Southern California.

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

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

Endnote

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.

Acknowledgements