



Computing Degree and Enrollment Trends

From the 2011-2012 CRA Taulbee Survey

**PhD Production in Computer Science Rises to Highest Level Ever
While Undergraduate Enrollment Grows for Fifth Straight Year**

By Stuart Zweben

Executive Summary

Summary of Results

- The number of new undergraduate computing majors among U.S. computer science departments rose an astonishing 29.2 percent, 22.8 percent among those departments reporting both this year and last year. This is the fifth straight year of increased enrollment in computing majors by new students.
- Bachelor's degree production increased by a double-digit percentage for the third straight year. In U.S. computer science departments the increases were 19.8 percent overall and 16.6 percent among those departments that reported both years.
- The fraction of women among bachelor's graduates in CS increased to 12.9 percent in 2011-12, compared to 11.7 percent in 2010-11.
- Overall Ph.D. production in computing programs reported by the Taulbee Survey reached its highest level ever, with 1,929 degrees granted. This represents an 8.2 percent increase over 2010-11. Among those departments reporting both this year and last year, the number of total doctoral degrees increased by 5.2 percent.

Introduction

The CRA Taulbee Survey is conducted annually by the Computing Research Association to document trends in student enrollment, degree production, employment of graduates, and faculty salaries in academic units in the United States and Canada that grant the Ph.D. in computer science (CS), computer engineering (CE) or information (I). Most of these academic units are departments, but some are colleges or schools of information or computing. In this report, we will use the term “department” to refer to the unit offering the program. This article and the accompanying figures and tables present the enrollment and degree production results from the 42nd 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 2013 at www.cra.org.

Information for the survey is gathered from CRA members and other PhD-granting institutions during the Fall of each year. Responses received by January 7, 2013 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 (2011-2012). Data for new students in all categories refer to the current academic year (2012-2013).

For this report, we surveyed a total of 277 Ph.D.-granting departments, of which 193 responded for a response rate of 70 percent. This is slightly higher than last year's 69 percent. The response rate for U.S. CS departments, by far the largest category, increased from 77 percent last year to 80 percent this year. Response rates are inexact because some departments provide only partial data, and some institutions provide a single joint response for multiple departments. Thus, the number of departments shown as reporting student data may not equal the overall total number of respondents for that category of department. To account for changes in response rate, we will comment not only on aggregate totals but also on data from those departments who responded to both this year's and last year's surveys. This will be a more accurate indication of the one-year changes affecting degree production and enrollments. Of the 152 U.S. CS departments responding to this year's survey, 134 provided doctoral data in both years and 127 provided bachelor's data both years. Of the 193 total departments responding to this year's survey, 167 provided doctoral data in both years and 151 provided bachelor's data in both years.

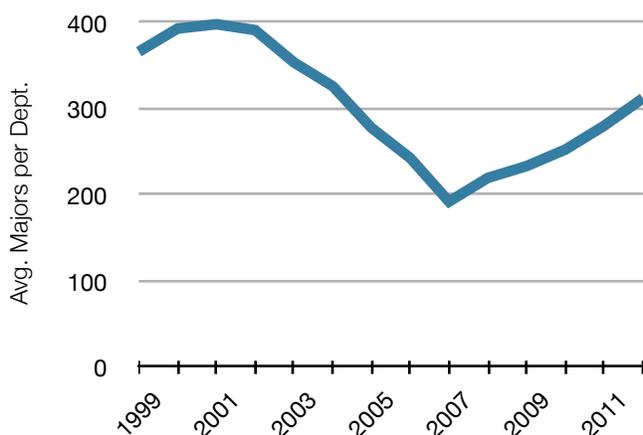
Table 1: Number of Respondents to the Taulbee Survey					
Year	US CS	US CE	Canadian	US I	Total
1995	110/133 (83%)	9/13 (69%)	11/16 (69%)		130/162 (80%)
1996	98/131 (75%)	8/13 (62%)	9/16 (56%)		115/160 (72%)
1997	111/133 (83%)	6/13 (46%)	13/17 (76%)		130/163 (80%)
1998	122/145 (84%)	7/19 (37%)	12/18 (67%)		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%)
2011	142/185 (77%)	13/31 (42%)	13/30 (43%)	16/21 (76%)	184/267 (69%)
2012	152/189 (80%)	11/32 (34%)	14/30 (47%)	16/26 (62%)	193/277 (70%)

Bachelor's Degree Production and Enrollments

Bachelor's degree production increased by a double-digit percentage for the third straight year. Among all departments reporting, the increase was 15.7 percent, but if only those departments who reported both years are counted, the increase was 17.1 percent. In U.S. computer science departments the increases were 19.8 percent overall and 16.6 percent among those departments that reported both years.

The number of new undergraduate computing majors among U.S. computer science departments rose an astonishing 29.2 percent, 22.8 percent among those departments reporting both this year

Figure 1. Average CS majors per U.S. CS Department



Source: Table 6: Total Bachelor's Enrollment by Department Type

and last year. This is the fifth straight year of increased enrollment in computing majors by new students. Total undergraduate enrollment in computing majors among U.S. CS departments increased 16.2 percent in aggregate, and 11.2 percent among departments reporting both this year and last year.

Once again, the number of CE degrees increased significantly in this year's report among U.S. CS departments that also give CE degrees. Degrees in the information area also increased, while degrees at Canadian CS programs held steady compared with last year's data. New student enrollment increased in aggregate

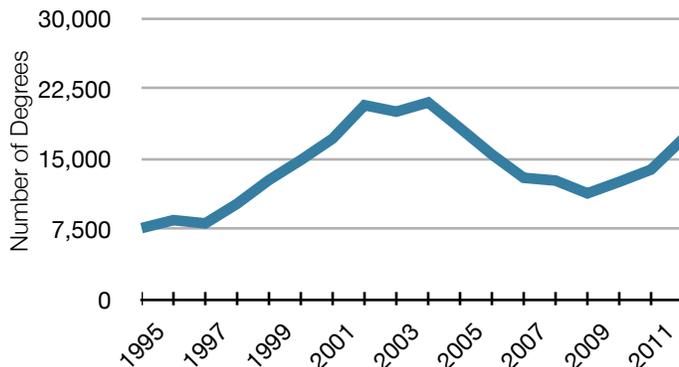
among departments offering CE and I programs but was fairly flat among Canadian departments. Total enrollment in CE programs increased in aggregate, while total enrollment in I programs and Canadian programs declined. It should be noted that the numbers for Canadian, CE and I are more volatile due to the small number of departments reporting in each of these areas.

The fraction of women among bachelor's graduates in CS increased to 12.9 percent in 2011-12, compared to 11.7 percent in 2010-11. In CE, the fraction of female graduates decreased, to 10.6 percent from 11.8 percent. The gender balance among graduates of I programs was similar in this year's data (17.2 percent female compared to last year's 17.5 percent).

This year there was a smaller percentage of Whites and greater percentages of Asian, Black and Hispanic graduates in CS programs. I programs also had a smaller fraction of Whites and a larger fraction of

Blacks among their graduates, CE programs had a slightly larger percentage of Non-resident Aliens, and a smaller percentage of Blacks and Hispanics as graduates. In aggregate across the

Figure 2. BS Production (All Departments)



Source: Table 3: Bachelor's Degrees Awarded by Department Type

three degree areas, about 63 percent of the graduates were White, 17 percent Asian, 7 percent Non-resident Aliens, and 13 percent all other ethnicity categories combined.

	Total						Only Departments Reporting Both Years					
	US CS Only			All Departments			US CS Only			All Departments		
	2011	2012	% chg	2011	2012	% chg	2011	2012	% chg	2011	2012	% chg
PhDs												
# Depts	140	150	7.1%	178	187	5.1%	134	134		167	167	
PhD Awarded	1,457	1,620	11.2%	1,782	1,929	8.2%	1,435	1,532	6.8%	1,736	1,826	5.2%
PhD Enrollment	12,035	13,235	10.0%	14,671	15,648	6.7%	11,765	12,528	6.5%	14,217	14,783	4.0%
New PhD Enroll	2,442	2,702	10.6%	2,812	3,064	9.0%	2,396	2,532	5.7%	2,744	2,869	4.6%
Bachelor's	2011	2012	% chg	2011	2012	% chg	2011	2012	% chg	2011	2012	% chg
# Depts	133	142	6.8%	165	174	5.5%	127	127		151	151	
BS Awarded	10,901	13,055	19.8%	13,806	15,975	15.7%	10,438	12,171	16.6%	12,694	14,867	17.1%
BS Enrollment	48,817	56,742	16.2%	60,636	67,850	11.9%	47,105	52,396	11.2%	56,344	62,296	10.6%
New BS Majors	13,337	17,226	29.2%	16,279	20,618	26.7%	12,614	15,492	22.8%	15,149	18,294	20.8%
BS Enroll/Dept	367.0	399.6	8.9%	367.5	389.9	6.1%	370.9	412.6	11.2%	373.1	412.6	10.6%

Department Type	# Depts	CS		CE		I		Total	
US CS Public	105	7,619	69.0%	1,578	67.0%	1,004	39.1%	10,201	63.9%
US CS Private	37	2,248	20.3%	268	11.4%	338	13.2%	2,854	17.9%
Total US CS	142	9,867	89.3%	1,846	78.4%	1,342	52.2%	13,055	81.7%
US CE	9	0	0.0%	406	17.2%	0	0.0%	406	2.5%
US Info	9	0	0.0%	0	0.0%	1,190	46.3%	1,190	7.4%
Canadian	14	1,182	10.7%	104	4.4%	38	1.5%	1,324	8.3%
Grand Total	174	11,049		2,356		2,570		15,975	

Table 4. Bachelor's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	9,349	87.1%	2,106	89.4%	2,129	82.8%	13,584	86.7%
Female	1,387	12.9%	250	10.6%	441	17.2%	2,078	13.3%
Total Known Gender	10,736		2,356		2,570		15,662	
Gender Unknown	313		0		0		313	
Grand Total	11,049		2,356		2,570		15,975	

Table 5. Bachelor's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	619	6.8%	216	10.5%	98	4.1%	933	6.9%
Amer Indian or Alaska Native	39	0.4%	6	0.3%	12	0.5%	57	0.4%
Asian	1,477	16.3%	447	21.7%	341	14.2%	2,265	16.7%
Black or African-American	407	4.5%	107	5.2%	203	8.4%	717	5.3%
Native Hawaiian/Pac Islander	18	0.2%	4	0.2%	3	0.1%	25	0.2%
White	5,793	64.0%	1,154	55.9%	1,522	63.2%	8,469	62.6%
Multiracial, not Hispanic	130	1.4%	27	1.3%	26	1.1%	183	1.4%
Hispanic, any race	575	6.3%	102	4.9%	203	8.4%	880	6.5%
Total Residency & Ethnicity Known	9,058		2,063		2,408		13,529	
Resident, ethnicity unknown	732		117		89		938	
Residency unknown	1,259		176		73		1,508	
Grand Total	11,049		2,356		2,570		15,975	

Table 6. Total Bachelor's Enrollment by Department Type

Department Type	CS				CE				I				Total	
	Major	Pre-major	# Depts	Avg. Major per Dept.	Major	Pre-major	Total	Avg. Major per Dept.	Major	Pre-major	Total	Avg. Major per Dept.	Major	Avg. Major per Dept.
US CS Public	34,099	7,039	103	331.1	7,092	812	42	168.9	3,812	369	23	165.7	45,003	432.7
US CS Private	9,006	554	35	257.3	871	15	9	96.8	1,862	0	5	372.4	11,739	335.4
US CS Total	43,105	7,593	138	312.4	7,963	827	51	156.1	5,674	369	28	202.6	56,742	408.2
US CE	0	0	0	0.0	1,974	225	9	219.3	0	0	0	0.0	1,974	219.3
US Information	0	0	0	0.0	0	0	0	0.0	2,553	653	9	283.7	2,553	283.7
Canadian	6,351	449	13	488.5	230	0	2	115.0	0	40	0	0.0	6,581	598.3
Grand Total	49,456	8,042	151	327.5	10,167	1,052	62	164.0	8,227	1,062	37	222.4	67,850	403.9

Master's Degree Production and Enrollments

Overall Master's degree production in CS increased in 2011-12. The increase was particularly strong among U.S. private institutions, which generated 40 percent of this past year's U.S. CS master's graduates compared with only 1/3 the previous year. The proportion of female graduates among computer science master's recipients decreased from 24.6 percent in 2010-11 to 22.6 percent in 2011-12. However, there was a somewhat larger fraction of women among I graduates this past year as compared with the previous year (51.7 percent vs. 47.8 percent). A higher fraction of the master's recipients were Non-resident Aliens this past year, but this was almost exactly offset by a decrease in those reported as resident Asians. This may be a function of the manner in which certain persons of Asian descent were counted during these two years, rather than reflecting any true demographic shift.

The number of new master's students increased among CS programs, both public and private. The total increase in the CS programs is more than 10 percent. A slightly larger proportion of new CS master's students are from outside of North America this year as compared with last year (62.3 percent vs. 61.1 percent last year), but the difference is entirely due to master's programs at private universities. The fraction of new master's students at U.S. public universities who are from outside North America actually declined slightly.

Table 7. Master's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	107	4,156	55.7%	402	45.8%	544	25.0%	5,102	48.5%
US CS Private	41	2,817	37.8%	75	8.5%	385	17.7%	3,277	31.2%
Total US CS	148	6,973	93.4%	477	54.3%	929	42.7%	8,379	79.7%
US CE	9	0	0.0%	312	35.5%	45	2.1%	357	3.4%
US Info	12	0	0.0%	0	0.0%	1204	55.3%	1,204	11.4%
Canadian	14	489	6.6%	89	10.1%	0	0.0%	578	5.5%
Grand Total	183	7,462		878		2,178		10,518	

Table 8. Master's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	5,645	77.4%	682	77.7%	1052	48.3%	7,379	71.3%
Female	1,644	22.6%	196	22.3%	1126	51.7%	2,966	28.7%
Total Known Gender	7,289		878		2,178		10,345	
Gender Unknown	173		0		0		173	
Grand Total	7,462		878		2,178		10,518	

Table 9. Master's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	4,123	62.3%	544	69.3%	397	19.8%	5,064	53.8%
Amer Indian or Alaska Native	10	0.2%	1	0.1%	9	0.4%	20	0.2%
Asian	484	7.3%	52	6.6%	213	10.6%	749	8.0%
Black or African-American	123	1.9%	8	1.0%	122	6.1%	253	2.7%
Native Hawaiian/Pac Island	9	0.1%	0	0.0%	0	0.0%	9	0.1%
White	1,725	26.1%	161	20.5%	1,144	57.0%	3,030	32.2%
Multiracial, not Hispanic	22	0.3%	1	0.1%	25	1.2%	48	0.5%
Hispanic, any race	123	1.9%	18	2.3%	96	4.8%	237	2.5%
Total Residency & Ethnicity Known	6,619		785		2,006		9,410	
Resident, ethnicity unknown	285		78		144		507	
Residency unknown	558		15		28		601	
Grand Total	7,462		878		2,178		10,518	

Table 10. Total Master's Enrollment by Department Type

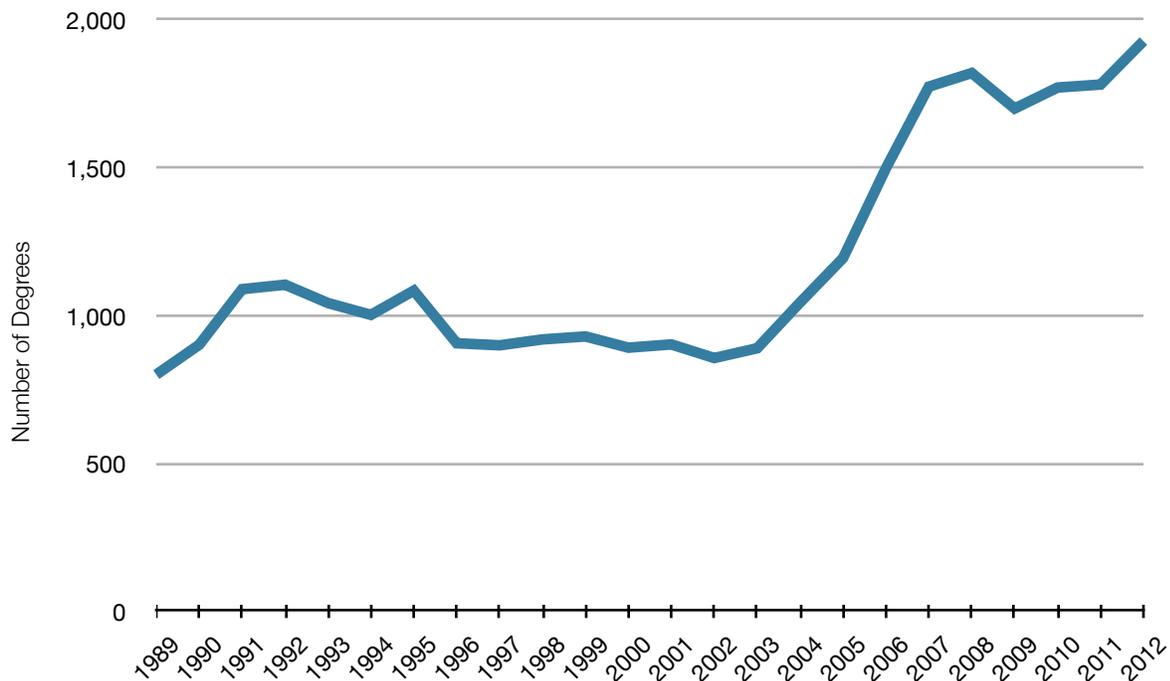
Department Type	CS			CE			I			Total		
	Total	# Depts	Avg / Dept	Total	# Depts	Avg / Dept	Total	# Dept	Avg / Dept	Total	# Dept	Avg / Dept
US CS Public	8,711	104	83.8	754	19	39.7	1,272	12	106.0	10,737	106	101.3
US CS Private	5,826	40	145.7	164	6	27.3	1,474	4	368.5	7,464	40	186.6
Total US CS	14,537	144	101.0	918	25	36.7	2,746	16	171.6	18,201	146	124.7
US CE	0	0		845	9	93.9	242	1		1,087	9	120.8
US Info	0	0		0	0		2,466	12	205.5	2,466	12	205.5
Canadian	1,390	13	106.9	103	2	51.5	0	0		1,493	13	114.8
Grand Total	15,927	157	101.4	1,866	36	51.8	5,454	29	188.1	23,247	180	129.2

Ph.D. Degree Production, Enrollments and Employment

Overall Ph.D. production in computing programs reported by the Taulbee Survey reached its highest level ever, with 1,929 degrees granted. This represents an 8.2 percent increase over 2010-11. Among those departments reporting both this year and last year, the number of total doctoral degrees increased by 5.2 percent. Overall Ph.D. production in U.S. CS departments was up 11.2 percent, and was up 6.8 percent among U.S. CS departments reporting both years. Women again comprised approximately 18 percent of CS doctoral graduates and 19 percent of all doctoral computing graduates, and once again half of the (CS and overall) doctoral degrees went to Non-resident Aliens.

The number of new Ph.D. students overall increased compared with last year (3,064 this year vs. 2,812 last year), and the average number of new CS Ph.D. students per department increased slightly. The number of new students in CE and Canadian programs also increased compared with last year's figures, while the number of new students per department in I programs decreased.

Figure 3. Total Ph.D. Production (CS & CE, US and Canada)



Source: Table 11: PhD Production and Pipeline by Department Type

The CE, Canadian, and I program comparisons are much more volatile than those for CS due to the small number of programs reporting from those strata. There was a slight increase in the proportion of new doctoral students from outside North America, from 56.3 percent last year to 57.4 percent this year. CE programs had the largest percentage from outside North America (71.3 percent) while I programs had the smallest (39.8 percent).

Artificial intelligence, software engineering, and networking continue to be the most popular areas of specialization for doctoral graduates. Databases, and theory and algorithms were the next most popular areas.

There was a significant increase in the fraction of new Ph.D.s who took positions in North American industry (to 55.5 percent from 47.2 percent in 2010-11 and 44.7 percent in 2009-10). The 2011-12 level is about the same as the historic high of 56.6 percent, set in 2007-08. A smaller fraction (28.9 percent) of graduates took North American academic jobs in 2011-12 as compared with 2010-11 (34.6 percent). The fraction taking tenure-track positions in North American doctoral-granting institutions dropped again this year, from 7.1 percent in 2010-11 to 6.6 percent in 2011-12, though the raw numbers of persons taking tenure-track positions in these departments was about the same in both years. The fraction taking positions in North American non-Ph.D.-granting departments dropped from 3.6 percent in 2010-11 to 2.5 percent in 2011-12. This is about the same level as in 2009-10. The fraction taking North American postdoctoral positions declined for the second straight year, to 13.4 percent from 16.8 percent.

The unemployment rate for new Ph.D.s dropped considerably this year, to 0.4 percent from 1.6 percent last year. The proportion of Ph.D. graduates who were reported taking positions outside of North America, among those whose employment is known, declined to 9.1 percent from 11.0 percent in 2010-11 and 11.8 percent in 2009-10. About 1/3 of those employed outside of North America went to industry, while just over 20 percent went to tenure-track academic positions and another 20 percent went to postdoctoral positions.

Table 11. PhD Production and Pipeline by Department Type

Department Type	# Depts	PhDs Awarded		PhDs Next Year		Passed Qualifier		Passed Thesis (if dept has)		
		#	Avg/Dept	#	Avg/Dept	#	Avg/Dept	#	# Dept	Avg/Dept
US CS Public	109	1,177	10.8	1,326	12.2	1,395	12.8	1,064	87	12.2
US CS Private	42	443	10.5	471	11.2	389	9.3	254	29	8.8
US CS Total	151	1,620	10.7	1,797	11.9	1,784	11.8	1,318	116	11.4
US CE	10	73	7.3	81	8.1	120	12.0	107	7	15.3
US Info	14	76	5.4	66	4.7	92	6.6	59	11	5.4
Canadian	14	160	11.4	163	11.6	142	10.1	155	12	12.9
Grand Total	189	1,929	10.2	2,107	11.1	2,138	11.3	1,639	146	11.2

Table 12. PhDs Awarded by Gender

	CS		CE		I		Total	
Male	1,275	82.2%	163	86.7%	70	55.1%	1,508	80.8%
Female	276	17.8%	25	13.3%	57	44.9%	358	19.2%
Total Known Gender	1,551		188		127		1,866	
Gender Unknown	55		6		2		63	
Grand Total	1,606		194		129		1,929	

Table 13. PhDs Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	763	51.3%	99	55.3%	32	26.9%	894	50.1%
Amer Indian or Alaska Native	1	0.1%	0	0.0%	1	0.8%	2	0.1%
Asian	168	11.3%	32	17.9%	27	22.7%	227	12.7%
Black or African-American	27	1.8%	1	0.6%	7	5.9%	35	2.0%
Native Hawaiian/Pac Islander	5	0.3%	0	0.0%	0	0.0%	5	0.3%
White	496	33.4%	45	25.1%	51	42.9%	592	33.2%
Multiracial, not Hispanic	5	0.3%	0	0.0%	0	0.0%	5	0.3%
Hispanic, any race	22	1.5%	2	1.1%	1	0.8%	25	1.4%
Total Residency & Ethnicity Known	1,487		179		119		1,785	
Resident, ethnicity unknown	25		1		5		31	
Residency unknown	94		14		5		113	
Grand Total	1,606		194		129		1,929	

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	3	0	10	3	3	10	1	5	4	13	2	9	6	7	2	0	3	6	6	11	104	6.6%
Researcher	10	0	3	3	0	1	0	9	1	0	2	5	0	2	5	3	0	6	2	14	66	4.2%
Postdoc	29	2	4	15	4	8	6	28	8	7	4	12	6	5	15	4	1	5	19	30	212	13.4%
Teaching Faculty	2	0	2	1	1	3	1	0	1	0	4	4	2	2	3	2	1	6	0	3	38	2.4%
North American, Other Academic																						
Other CS/CE/I Dept.	3	0	0	1	2	4	4	6	1	3	1	0	1	1	3	2	0	5	1	1	39	2.5%
Non-CS/CE/I Dept.																						
North American, Non-Academic																						
Industry	101	3	81	40	64	30	22	26	31	11	18	77	38	37	32	11	8	95	53	102	880	55.5%
Government	6	1	4	8	0	1	5	5	7	1	0	3	3	0	1	3	0	3	0	5	56	3.5%
Self-Employed	3	0	0	1	0	1	0	0	2	1	0	1	1	0	1	0	0	3	0	7	21	1.3%
Unemployed	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	6	0.4%
Other	1	0	0	2	0	1	0	4	0	4	0	0	0	0	2	0	0	1	0	6	21	1.3%
Total Inside North America																						
	159	6	105	74	74	60	39	83	55	40	31	111	57	55	64	26	13	130	81	180	1443	90.9%

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																						
Ten-Track in PhD	3	0	5	1	2	4	2	1	3	0	0	2	1	0	0	0	0	0	1	4	31	2.0%
Researcher in PhD	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1	4	0.3%
Postdoc in PhD	10	0	0	0	0	1	0	1	0	1	2	0	0	1	3	0	0	0	7	3	30	1.9%
Teaching in PhD	2	1	0	0	0	0	0	1	0	0	2	0	0	1	0	0	1	0	1	1	10	0.6%
Other Academic	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	2	10	0.6%
Industry	9	0	1	5	1	2	1	0	4	1	4	4	2	1	1	1	0	4	3	3	47	3.0%
Government	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	5	0.3%
Other	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	0	1	7	0.4%
Total Outside NA	26	1	6	7	6	9	4	5	8	5	5	13	4	4	4	2	2	6	12	15	144	9.1%
Total with Employment Data, Inside North America plus Outside North America																						
	185	7	111	81	80	69	43	88	63	45	36	124	61	59	68	28	15	136	93	195	1587	
Employment Type & Location Unknown																						
	18	1	11	18	10	11	6	9	6	12	13	23	5	5	10	4	5	13	23	139	342	
Grand Total	203	8	122	99	90	80	49	97	69	57	49	147	66	64	78	32	20	149	116	334	1,929	

Concluding Observations

The popularity of computing as a major at both the undergraduate and graduate levels seems to be growing at a solid clip. Industry positions for doctoral graduates have been able to keep up with increased supply, even as the academic job market did not show any growth. There is anecdotal evidence of increased faculty positions available in academia in 2012-13, and it will be interesting to see if this results in a narrowing of the now very wide gap in the fraction of new doctoral grads going to industry vs. those going to academia. The several-year increase in undergraduate computing enrollments may provide pressure on both doctoral granting programs and non-doctoral granting programs to increase the number of faculty.

Participating Schools

U.S. CS Public (109 departments): Arizona State, Auburn, City University of New York Graduate Center, Clemson University, College of William & Mary, Colorado School of Mines, Colorado State, Florida International, Florida State, George Mason, Georgia State, Georgia Tech, Indiana, Iowa State, Kansas State, Kent State, Louisiana State, Michigan State, Michigan Technological, Mississippi State, Montana State, Naval Postgraduate School, New Jersey Institute of Technology, New Mexico State, North Carolina State, North Dakota State, Ohio State, Ohio, Old Dominion, Oregon State, Penn State, Portland State, Purdue, Rutgers, Southern Illinois, Stony Brook SUNY, Temple, Texas A&M, Texas Tech University, Universities at Albany and Buffalo (SUNY), Universities of Alabama (Birmingham, Huntsville, and Tuscaloosa), Arizona, Arkansas, Arkansas at Little Rock, California (Berkeley, Davis, Irvine, Los Angeles, Riverside, San Diego, Santa Barbara, and Santa Cruz), Central Florida, Cincinnati, Colorado (Boulder), Connecticut, Delaware, Florida, Georgia, Hawaii, Houston, Idaho, Illinois (Chicago and Urbana-Champaign), Iowa, Kansas, Kentucky, Maryland (College Park and Baltimore County), Massachusetts (Amherst, Boston, and Lowell), Michigan, Minnesota, Mississippi, Missouri (Columbia), Nebraska (Lincoln), Nevada (Las Vegas and Reno), New Hampshire, New Mexico, North Carolina (Chapel Hill and Charlotte), North Texas, Oklahoma, Oregon, Pittsburgh, Rhode Island, South Carolina, South Florida, Tennessee (Knoxville), Texas (Austin and El Paso), Utah, Virginia, Washington, Wisconsin (Madison and Milwaukee), and Wyoming, Virginia Commonwealth, Virginia Tech, Washington State, Wayne State, Western Michigan, and Wright State.

U.S. CS Private (42 departments): Boston University, Brandeis, Brown, Carnegie Mellon, Case Western Reserve, Columbia, Cornell, Dartmouth, DePaul, Drexel, Duke, Emory, Florida Institute of Technology, Georgetown, Harvard, Illinois Institute of Technology, Johns Hopkins, Lehigh, Massachusetts Institute of Technology, New York University, Northeastern, Northwestern, Nova Southeastern, Pace, Princeton, Rensselaer Polytechnic Institute, Rice, Rochester Institute of Technology, Stanford, Stevens Institute of Technology, Toyota Technological Institute at Chicago, Tufts, Universities of Chicago, Notre Dame, Pennsylvania, Rochester, Southern California, and Tulsa, Vanderbilt, Washington University in St. Louis, Worcester Polytechnic Institute, and Yale.

U.S. Computer Engineering (11 departments): Florida Institute of Technology, North Carolina State, Northeastern, Santa Clara, Universities of California (Santa Cruz), Illinois (Urbana-Champaign), Iowa, New Mexico, Rhode Island, and Southern California, and Virginia Tech.

U.S. Information Programs (16 departments): Cornell, Drexel, Indiana, Penn State, Purdue, Syracuse, University at Albany, Universities of California (Berkeley, Los Angeles, and Santa Cruz), Maryland (Baltimore County), Michigan, North Carolina (Chapel Hill), Pittsburgh, Texas (Austin), and Washington.

Canadian (14 departments): Concordia, Dalhousie, McGill, Memorial University of Newfoundland, Simon Fraser, Universities of British Columbia, Calgary, Manitoba, New Brunswick, Ottawa, Toronto, Victoria, and Waterloo, and York University.

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