



Computing Degree and Enrollment Trends

From the 2010-2011 CRA Taulbee Survey

**Undergraduate Degree Production in Computer Science Rises
While Enrollment Grows for Fourth Straight Year**

By Stuart Zweben

Executive Summary

Summary of Results

- Among U.S. schools that reported data this year and last, enrollments in undergraduate computer science programs rose 9.6 percent in the 2011-12 school year – the fourth straight year of increase. Overall enrollment – including schools that did not participate in the survey last year – increased by 11.5 percent per department compared to the 2010-11 school year.
- Anecdotal reports suggest that, once again, growth in enrollment is being constrained at institutions not by student interest, but by enrollment caps in place in university computer science departments. Free of these caps – in place because of faculty or infrastructure limitations – enrollment figures might have reflected even larger increases.
- The number of Bachelor's degrees in computer science awarded by U.S. schools increased by 10.5 percent in the 2010-11 school year. Among schools who responded both this year and last, the increase was 12.9 percent.
- Total Ph.D. production in computing programs held steady in 2010-11, with 1,782 degrees granted.

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 academic units in the United States and Canada that grant the Ph.D. in computer science (CS), computer engineering (CE) or information (I)². 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 41st 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 2012 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 23, 2012 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 (2010-2011). Data for new students in all categories refer to the current academic year (2011-2012).

For this report, we surveyed a total of 267 Ph.D.-granting departments, of which 184 responded for a response rate of 69 percent. This is lower than last year’s 74 percent. 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 does not equal the overall total number of respondents for that category of department. Nevertheless, it is clear that the response rate decreased notably for U.S. CS departments and Canadian departments. To account for these 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 140 U.S. CS departments providing student data to this year’s survey, 135 responded last year also. Of the 178 total departments providing student data to this year’s survey, 165 also responded last year.

Departments that provided salary data were sent preliminary results about faculty salaries in January 2012; these results included additional distributional information not contained in this report. The CRA Board views this as a benefit of participating in the survey. This year’s respondents are listed at the end of this article; we thank all of them.

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.

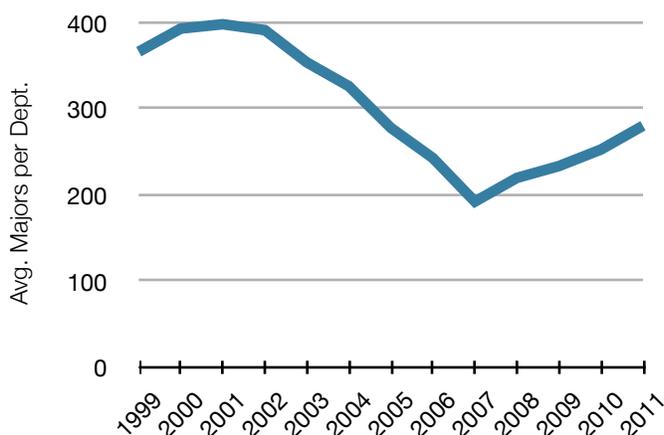
² Information (I) programs included here are Information Science, Information Systems, Information Technology, Informatics, and related disciplines with a strong computing component. Surveys were sent to CRA members, the CRA Deans group members, and participants in the iSchools Caucus (www.ischools.org)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

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%)

Bachelor's Degree Production and Enrollments

The number of new computing majors among U.S. computer science departments rose 6.7 percent (7.4 percent among those departments reporting both this year and last year). This is the fourth straight year of increased enrollment in computing majors by new students. Total enrollment in computing majors among U.S. CS departments increased 5.9 percent in aggregate (9.6 percent among departments reporting both this year and last year). Anecdotal reports suggest that, once again, growth in enrollment is being constrained at institutions not by student interest, but by enrollment caps in place in university computer science departments. Free of these caps – in place because of faculty or infrastructure limitations – enrollment figures might have reflected even larger increases.

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



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

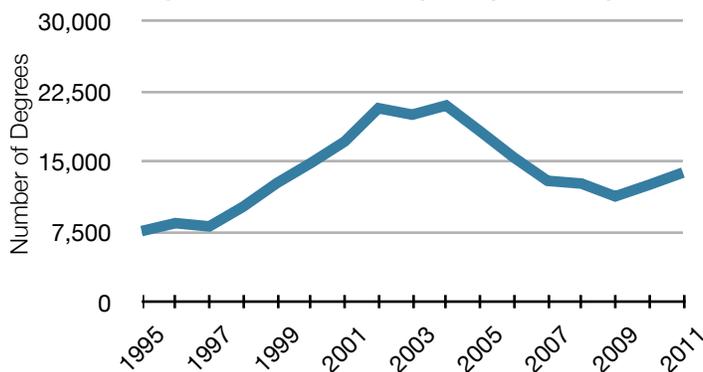
departments and among U.S. CS departments who also give CE degrees. Degrees in the information area also increased significantly among U.S. departments offering information degrees, but this may be affected by the categorization of several institutions whose CS and I departments report jointly. New student enrollment increased in aggregate among departments offering I programs but decreased among those offering CE programs (though it increased among CE departments that reported both years). Total enrollment in both CE and I programs increased in aggregate, though total enrollment decreased in I departments that reported both years. These data suggest increased interest in undergraduate computing degrees of all types within the U.S. It should be noted that the numbers for CE and I are more volatile due to the small number of departments reporting in each of these areas.

For the second straight year, there was a double-digit percentage increase in bachelor's degree production. Among all departments reporting, the increase was 10.4 percent, but if only those departments who reported both years are counted, the increase was 12.9 percent. Bachelor's degree production in US computer science departments was up 10.5 percent overall and also was up 12.9 percent among those departments who reported both this year and last year.

The number of CE degrees also increased significantly this year, among U.S. CE

departments and among U.S. CS departments who also give CE degrees. Degrees in the information area also increased significantly among U.S. departments offering information degrees, but this may be affected by the categorization of several institutions whose CS and I departments report jointly. New student enrollment increased in aggregate among departments offering I

Figure 2. BS Production (All Departments)



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

Canadian statistics also are volatile due to the small number of departments reporting. In aggregate, they show slightly decreased degree production, but Canadian response to the survey was unusually low this year and among Canadian departments reporting both years, there was an

11 percent increase in bachelor's degree production. New student enrollment among Canadian departments that reported both years increased by 3.6 percent, but total enrollment in these departments was down a little less than one percent.

The fraction of women among bachelor's graduates decreased in CS this year, from 13.8 percent in 2009-10 to 11.7 percent in 2010-11. In CE and I, the fraction of female graduates increased, to 11.8 percent in CE and to 17.5 percent in I. This year there was a smaller percentage of Whites and greater percentages of Non-resident Alien, Black and Hispanic graduates in CE programs. CS programs, on the other hand, showed a slight increase in the proportion of Whites and a slight decrease in the proportion of Non-resident Alien graduates. I programs had a smaller fraction of Whites, Blacks and Non-resident Aliens, and increased fractions of Asians and Hispanics. Overall across the three degree areas, about 65 percent of the graduates were White, 15 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		
	2010	2011	% chg	2010	2011	% chg	2010	2011	% chg	2010	2011	% chg
PhDs												
# Depts	150	140	-6.7%	192	178	-6.8%	135	135		168	168	
PhD Awarded	1,501	1,457	-2.9%	1,772	1,782	0.6%	1,419	1,422	0.2%	1,624	1,708	5.2%
PhD Enrollment	12,482	12,114	-2.9%	15,038	14,671	-2.4%	11,527	11,742	1.9%	13,578	13,815	1.7%
New PhD Enroll	2,560	2,465	-3.7%	2,962	2,812	-5.1%	2,394	2,388	-0.3%	2,712	2,715	0.1%
Bachelor's	2010	2011	% chg	2010	2011	% chg	2010	2011	% chg	2010	2011	% chg
# Depts	140	133	-5.0%	176	165	-6.3%	125	125		153	153	
BS Awarded	9,904	10,946	10.5%	12,501	13,806	10.4%	8,731	9,859	12.9%	11,072	12,505	12.9%
BS Enrollment	46,218	48,952	5.9%	58,784	60,636	3.2%	41,034	44,966	9.6%	52,143	56,077	7.5%
New BS Majors	12,556	13,400	6.7%	15,905	16,279	2.4%	11,286	12,124	7.4%	14,031	14,972	6.7%
BS Enroll/Dept	330.1	368.1	11.5%	334.0	367.5	10.0%	328.3	359.7	9.6%	340.8	366.5	7.5%

Department Type	# Depts	CS		CE		I		Total	
US CS Public	99	6,358	68.5%	1301	61.8%	993	41.1%	8,652	62.7%
US CS Private	34	1,792	19.3%	180	8.6%	322	13.3%	2,294	16.6%
Total US CS	133	8,150	87.8%	1481	70.4%	1315	54.4%	10,946	79.3%
US CE	10	0	0.0%	561	26.7%	0	0.0%	561	4.1%
US Info	9	0	0.0%	0	0.0%	1095	45.3%	1,095	7.9%
Canadian	13	1,136	12.2%	62	2.9%	6	0.2%	1,204	8.7%
Grand Total	165	9,286		2,104		2,416		13,806	

Table 4. Bachelor's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	7,983	88.3%	1,856	88.2%	1,993	82.5%	11,832	87.3%
Female	1,057	11.7%	248	11.8%	422	17.5%	1,727	12.7%
Total Known Gender	9,040		2,104		2,415		13,559	
Gender Unknown	246		0		1		247	
Grand Total	9,286		2,104		2,416		13,806	

Table 5. Bachelor's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	524	7.0%	179	10.0%	78	3.6%	781	6.8%
Amer Indian or Alaska Native	39	0.5%	8	0.4%	16	0.7%	63	0.5%
Asian	1,115	14.8%	337	18.8%	302	13.9%	1,754	15.3%
Black or African-American	274	3.6%	106	5.9%	151	6.9%	531	4.6%
Native Hawaiian/Pac Islander	22	0.3%	7	0.4%	8	0.4%	37	0.3%
White	5026	66.9%	981	54.7%	1432	65.8%	7,439	64.8%
Multiracial, not Hispanic	104	1.4%	28	1.6%	3	0.1%	135	1.2%
Hispanic, any race	409	5.4%	146	8.1%	187	8.6%	742	6.5%
Total Residency & Ethnicity Known	7,513		1,792		2,177		11,482	
Resident, ethnicity unknown	741		200		99		1,040	
Residency unknown	1032		112		140		1,284	
Grand Total	9,286		2,104		2,416		13,806	

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	29,163	5747	98	297.6	5398	987	33	163.6	3875	299	22	176.1	38,436	388.2
US CS Private	7852	248	34	230.9	725	9	9	80.6	248	0	5	49.6	8,825	259.6
US CS Total	37,015	5995	132	280.4	6123	996	42	145.8	5814	299	27	215.3	48,952	368.1
US CE	0	0	0	0.0	1603	235	9	178.1	0	0	0	0.0	1,603	160.3
US Information	0	0	0	0.0	0	0	0	0.0	3063	838	8	382.9	3,063	340.3
Canadian	6744	340	13	518.8	274	0	3	91.3	0	0	0	0.0	7,018	539.8
Grand Total	43,759	6,335	145	301.8	8,000	1,231	54	148.1	8,877	1,137	35	253.6	60,636	367.5

Master's Degree Production and Enrollments

Master's degree production in CS was flat in 2010-11 after accounting for the decreased number of departments reporting. However, master's degree production increased sharply in CE and I departments, resulting in an overall increase in production of 5 percent even with fewer departments reporting overall.

The proportion of female graduates among master's recipients increased from 27.2 percent in 2009-10 to 29.5 percent in 2010-11. In computer science, the increase was from 21.0 percent to 24.6 percent. A higher fraction of the master's recipients were Black, Hispanic or Asian this year as compared with last year, while there was a somewhat smaller proportion of Whites and Non-resident Aliens receiving master's degrees this year.

The number of new master's students in CS programs this year is similar to last year on a per department basis, though there is an increase in new master's students among CE and I programs. A larger proportion of new master's students are from outside of North America this year as compared with last year (56.2 percent vs. 51.2 percent last year).

Table 7. Master's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	109	4,030	61.0%	526	44.5%	521	23.6%	5,077	50.8%
US CS Private	40	2,054	31.1%	137	11.6%	414	18.8%	2,605	26.1%
Total US CS	150	6,084	92.0%	663	56.0%	935	42.4%	7,682	76.8%
US CE	12	0	0.0%	428	36.2%	0	0.0%	428	4.3%
US Info	13	0	0.0%	0	0.0%	1271	57.6%	1,271	12.7%
Canadian	18	527	8.0%	92	7.8%	0	0.0%	619	6.2%
Grand Total	192	6,611		1,183		2,206		10,000	

Table 8. Master's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	4,968	75.4%	920	77.8%	1150	52.2%	7,038	70.5%
Female	1,623	24.6%	262	22.2%	1054	47.8%	2,939	29.5%
Total Known Gender	6,591		1,182		2,204		9,977	
Gender Unknown	20		1		2		23	
Grand Total	6,611		1,183		2,206		10,000	

Table 9. Master's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	3,332	56.7%	776	72.6%	389	19.6%	4,497	50.4%
Amer Indian or Alaska Native	12	0.2%	0	0.0%	12	0.6%	24	0.3%
Asian	753	12.8%	108	10.1%	245	12.3%	1,106	12.4%
Black or African-American	96	1.6%	13	1.2%	123	6.2%	232	2.6%
Native Hawaiian/Pac Island	19	0.3%	0	0.0%	6	0.3%	25	0.3%
White	1533	26.1%	142	13.3%	1113	56.1%	2,788	31.2%
Multiracial, not Hispanic	8	0.1%	4	0.4%	4	0.2%	16	0.2%
Hispanic, any race	119	2.0%	26	2.4%	92	4.6%	237	2.7%
Total Residency & Ethnicity Known	5,872		1,069		1,984		8,925	
Resident, ethnicity unknown	320		88		205		613	
Residency unknown	419		26		17		462	
Grand Total	6,611		1,183		2,206		10,000	

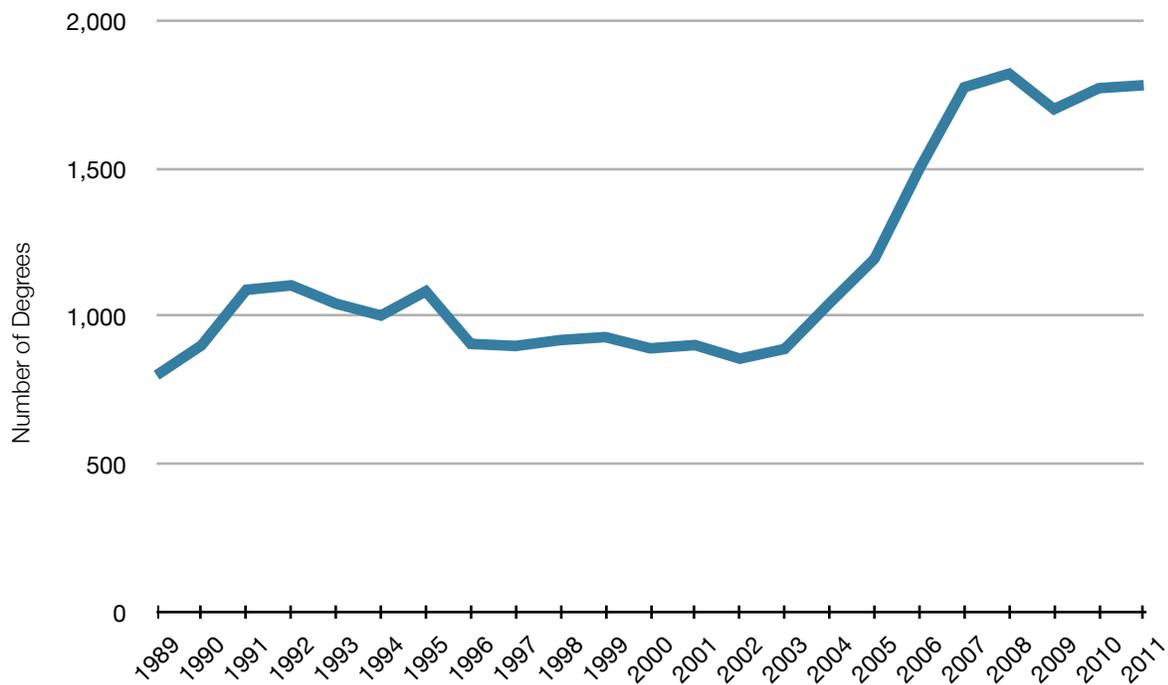
Table 10. Total Master's Enrollment by Department Type

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	8,048	98	82.1	895	22	40.7	1088	11	98.9	10,031	98	102.4
US CS Private	4,726	34	139.0	185	6	30.8	1495	4	373.8	6,406	34	188.4
Total US CS	12,774	132	96.8	1080	28	38.6	2583	15	172.2	16,437	132	124.5
US CE	0	0		950	9	105.6	0	0		950	9	105.6
US Info	0	0		0	0		2916	12	243.0	2,916	12	243.0
Canadian	1,114	12	92.8	98	2	49.0	0	0		1,212	12	101.0
Grand Total	13,888	144	96.4	2,128	39	54.6	5,499	27	203.7	21,515	165	130.4

Ph.D. Degree Production, Enrollments and Employment

Total Ph.D. production in computing programs held steady in 2010-11, with 1,782 degrees granted. However, if only departments reporting both years are considered, the number of total doctoral degrees increased by 5.2 percent. Overall Ph.D. production in U.S. CS departments was down slightly (1,457 vs. 1,501 in 2009-10) but was steady among U.S. CS departments reporting both years (1,422 vs 1,419 in 2009-10). Ph.D. production was up about 22 percent among both CE departments and Canadian departments that reported both years. A similar fraction of this year's computer science doctoral graduates were women (18.4 percent vs. 18.8 percent in 2009-10), a smaller fraction of this year's I school graduates were women (32.5 percent vs 40.2 percent in 2009-10), and a larger fraction of CE graduates were women (22.1 percent vs. 15.4 percent in 2009-10). A smaller fraction of this year's graduates were White (34.3 percent vs. 36.7 percent in 2009-10). This change was largest at I schools, where there was a 7 percent smaller fraction of Whites and a 7 percent larger fraction of Non-resident Aliens, a reverse of what was experienced last year, but this may reflect differences in the reporting departments.

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



Source: Table 11 : PhD Production and Pipeline by Department

The number of new Ph.D. students overall is about 5 percent less than last year (2,812 this year vs. 2,962 last year), but among departments that reported both years, the total is similar to last year (2,715 per department this year vs. 2,712 last year). The number of new students in Canadian programs that reported both years increased 17.4 percent, however. The overall proportion of new doctoral students from outside North America, 56.3 percent, is similar to last year's 56.8 percent, but the proportion of students from outside North America in U.S. CS departments rose from 56.1 percent last year to 57.2 percent this year. Total enrollment in computer science doctoral programs is comparable to that of last year, after accounting for the decreased number of departments

reporting this year, although total enrollment in both CE departments and I-school departments increased on a per department basis.

Artificial intelligence, software engineering, and networking continue to be the most popular areas of specialization for doctoral graduates, though this year software engineering replaced networking as the number two area behind AI. Theory and algorithms, databases, and graphics/visualization remained the next three most popular areas.

Only 7.1 percent of the 2010-11 graduates went into tenure-track positions at North American Ph.D.-granting departments, down from 8.2 percent the previous year and 10.4 percent two years ago. However, the fraction of new doctoral graduates who went into positions as researchers at these departments increased from 3.4 percent to 5.1 percent. Also, the fraction of new graduates who went to non-doctoral-granting North American computing departments increased from 2.4 percent last year to 3.6 percent this year. This year, 47.2 percent of doctoral graduates went into industry, compared with 44.7 percent of 2009-10 graduates. The 2010-11 level of 47.2 percent was about the same as that of 2008-09. The fraction of Ph.D. graduates who took postdoctoral positions at North American Ph.D.-granting departments dropped from 19.5 percent to 16.8 percent. The proportion of new doctoral graduates who were not employed increased slightly, from 1.1 percent last year to 1.6 percent this year. Note that all these percentages are of those whose employment was known rather than of the total graduates for the year. The number of graduates whose employment was reported as “unknown” was 20% this year compared to 15% last year and 19% the previous year.

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	104	1,062	10.2	1,260	12.1	1,367	13.1	899	87	10.3
US CS Private	36	395	11.0	426	11.8	360	10.0	278	26	10.7
US CS Total	140	1,457	10.4	1,686	12.0	1,727	12.3	1,177	113	10.4
US CE	12	80	6.7	55	4.6	89	7.4	58	9	6.4
US Info	13	80	6.2	86	6.6	95	7.3	55	10	5.5
Canadian	13	165	12.7	110	8.5	173	13.3	171	12	14.3
Grand Total	178	1,782	10.0	1,937	10.9	2,084	11.7	1,461	144	10.1

Table 12. PhDs Awarded by Gender

	CS		CE		I		Total	
Male	1,154	81.6%	159	77.9%	81	67.5%	1,394	80.2%
Female	261	18.4%	45	22.1%	39	32.5%	345	19.8%
Total Known Gender	1,415		204		120		1,739	
Gender Unknown	41		1		1		43	
Grand Total	1,456		205		121		1,782	

Table 13. PhDs Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	634	48.1%	130	67.4%	44	37.0%	808	49.6%
Amer Indian or Alaska Native	2	0.2%	0	0.0%	2	1.7%	4	0.2%
Asian	171	13.0%	16	8.3%	14	11.8%	201	12.3%
Black or African-American	16	1.2%	1	0.5%	6	5.0%	23	1.4%
Native Hawaiian/Pac Islander	4	0.3%	0	0.0%	0	0.0%	4	0.2%
White	465	35.3%	42	21.8%	52	43.7%	559	34.3%
Multiracial, not Hispanic	3	0.2%	0	0.0%	0	0.0%	3	0.2%
Hispanic, any race	22	1.7%	4	2.1%	1	0.8%	27	1.7%
Total Residency & Ethnicity Known	1,317		193		119		1,629	
Resident, ethnicity unknown	43		4		2		49	
Residency unknown	96		8		0		104	
Grand Total	1,456		205		121		1,782	

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	14	1	5	6	2	10	1	2	5	9	2	6	2	3	1	4	7	6	13	102	7.1%
Researcher	6	1	4	6	1	1	0	6	2	0	2	7	2	2	3	1	3	7	17	73	5.1%
Postdoc	38	1	12	17	4	12	0	20	7	5	2	12	7	14	6	3	10	30	34	241	16.8%
Teaching Faculty	2	1	1	0	0	1	0	1	1	2	1	1	1	0	0	3	4	4	4	28	2.0%
North American, Other Academic																					
Other CS/CE/I Dept.	3	0	4	1	1	1	4	2	2	0	5	6	1	0	0	0	3	1	18	52	3.6%
Non-CS/CE/I Dept.																					
North American, Non-Academic																					
Industry	64	2	49	46	41	24	20	17	40	5	6	67	29	22	6	12	86	32	83	676	47.2%
Government	7	0	5	2	6	2	5	3	8	1	2	1	0	0	4	1	4	2	5	60	4.2%
Self-Employed	0	0	0	1	0	1	0	1	0	0	2	2	2	0	0	0	1	1	1	13	0.9%
Unemployed	2	0	2	1	2	2	1	0	2	0	1	3	0	0	0	2	0	1	3	23	1.6%
Other	2	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	7	0.5%
Total Inside North America																					
	138	6	83	80	57	54	32	53	67	22	23	106	44	35	48	20	118	85	178	1,275	89.0%

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	5	0	5	1	1	0	0	0	3	2	1	6	1	0	0	0	1	4	3	2	35
Researcher in PhD	1	0	1	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	1	3	11
Postdoc in PhD	8	0	2	1	2	1	0	2	0	0	1	0	1	1	4	0	0	3	6	3	35
Teaching in PhD	1	0	1	0	0	0	0	1	1	0	2	1	0	0	0	0	1	1	0	0	9
Other Academic	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	2	8
Industry	0	0	4	5	1	0	1	2	1	1	0	13	1	1	1	0	1	4	2	7	45
Government	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	1	0	1	0	1	7
Other	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	7
Total Outside NA	16	0	14	9	7	2	3	8	8	3	5	20	3	2	5	2	3	14	12	21	157
Total with Employment Data, Inside North America plus Outside North America																					
	154	6	97	89	64	56	35	61	75	25	28	126	47	37	53	22	29	132	97	199	1,432
Employment Type & Location Unknown																					
	39	0	9	22	6	13	2	7	7	5	11	14	8	11	7	5	2	15	22	145	350
Grand Total	193	6	106	111	70	69	37	68	82	30	39	140	55	48	60	27	31	147	119	344	1,782

Concluding Observations

The near-term health of computing programs continues to be strong overall, with continued increases in undergraduate enrollments, and steady or increased graduate enrollments. Though a smaller fraction of doctoral graduates took tenure-track and postdoctoral positions at North American Ph.D.-granting departments, increased positions in industry and as academic researchers compensated for this. These changes are consistent with economic improvement, but as they are only one-year changes they should be viewed with caution. It is hoped that the several-year increase in undergraduate computing enrollments also will result in a greater number of faculty openings at both doctoral granting programs and non-doctoral granting programs.

Participating Schools

U.S. CS Public (105 departments): Arizona State, Auburn, City University of New York, Graduate Center, Clemson, College of William & Mary, Colorado School of Mines, Colorado State, Florida International, George Mason, Georgia Tech, Georgia State, Indiana, Iowa State, Kansas State, Kent State, LSU, 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 Carbondale, Stony Brook (SUNY), Texas A&M, Texas Tech, the Universities at Albany and Buffalo (SUNY); Universities of Alabama (Birmingham and Tuscaloosa), Arizona, 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, Houston, Idaho, Illinois (Chicago and Urbana-Champaign), Iowa, Kansas, Kentucky, Louisiana at Lafayette, Maryland, Maryland Baltimore County, Massachusetts (Amherst, Boston), Michigan, Minnesota, Mississippi, Missouri (Columbia), Nebraska (Omaha, Lincoln), Nevada (Las Vegas, Reno), New Hampshire, New Mexico, North Carolina (Chapel Hill, Charlotte), North Texas, Oklahoma, Oregon, Pittsburgh, Rhode Island, South Carolina, South Florida, Tennessee (Knoxville), Texas (Arlington, Austin, Dallas), Utah, Virginia, Washington, Wisconsin (Madison), and Wyoming; Virginia Commonwealth, Virginia Tech, Washington State, Wayne State, Western Michigan, and Wright State.

U.S. CS Private (37 departments): Boston University, Brown University, Carnegie Mellon, Case Western Reserve, Columbia, Cornell, Dartmouth, DePaul, Drexel, Duke, Florida Institute of Technology, Harvard, Illinois Institute of Technology, Johns Hopkins, Lehigh, Massachusetts Institute of Technology, New York, Northeastern, Northwestern, Pace, Polytechnic, Princeton, Rensselaer, Rice, Rochester Institute of Technology, Stanford, Stevens Institute of Technology, Toyota Technological Institute, Tufts; the Universities of Chicago, Notre Dame, Pennsylvania, Rochester, and Tulsa; Washington University in St. Louis, Worcester Polytechnic Institute, and Yale.

U.S. Computer Engineering (13 departments): Boston University, Florida Institute of Technology, Mississippi State, North Carolina State, Northeastern, Ohio State, Santa Clara; Universities of California (Santa Cruz), Illinois (Urbana Champaign), Iowa, New Mexico, and Southern California; Virginia Tech.

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

Canadian (13 departments): Concordia, McGill, Memorial University of Newfoundland, Simon Fraser ; Universities of British Columbia, Calgary, Manitoba, Ottawa, Saskatchewan, Toronto, Waterloo, and Western Ontario; York.

Acknowledgements

Betsy Bizot once again provided valuable assistance with the data collection, tabulation, and analysis for this survey.