2010-2011 Taulbee Survey

Continued Increase in Undergraduate CS Degree Production; Slight Rise in Doctoral Production

By Stuart Zweben and Betsy Bizot

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 results from the 41st annual *CRA Taulbee Survey*.

Information is gathered during the fall. Responses received by January 23, 2012 are included in the 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 (2010-11). Data for new students in all categories refer to the current academic year (2011-12). Projected student production and information on faculty salaries are those effective January 1, 2012.

We surveyed a total of 267 Ph.D.-granting departments; 184 returned their survey forms, for a response rate of 69 percent. This is lower than last year's 74 percent, due to lower response rates from the CS and Canadian departments (77 and 43 percent, respectively). The response rate from CE departments was 42 percent, and that from I departments was 76 percent, both slightly higher than last year. Figure 1 shows the history of response rates to the survey. Response rates are inexact because some departments provide only partial data, and some institutions provide a single joint response for multiple departments. Thus, in some tables the number of departments shown as reporting will not equal the overall total number of respondents for that category of department.

To account for the changes in response rate, we will comment not only on aggregate totals but also on averages per department reporting or data from those departments that responded to both this year's and last year's surveys. This will be a more accurate indication of the one-year changes affecting the data.

Departments that responded to the survey 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, we modified the manner in which we report data for U.S. CS departments. Degree, enrollment and faculty salary data are stratified according to a) whether the institution is public or private, and b) the tenure-track faculty size of the reporting department. The faculty size strata deliberately overlap, so that data from most departments affect multiple strata. This may be especially useful to departments near the boundary of one stratum. Salary data also are stratified according to the population of the locale in which the institution is located[3]. This will allow our readers to see multiple views of important data, and hopefully gain new insights from them. These stratification dimensions were recommended by the CRA Surveys Committee[4] and approved by the CRA Board of Directors, following extensive discussion of various options. We no longer stratify the data according to any ranking of academic departments.

In addition to tabular presentations of data, we will use "box and whisker" diagrams to show medians, quartiles, and the range between the 10th and 90th percentile data points. The March 2012 *CRN* illustrated the use of these diagrams.

We thank all respondents to this year's questionnaire. Departments that participated are listed at the end of this article.

Doctoral Degree Production, Enrollments and Employment (Tables D1-D8; Figures D1-D6)

Overall, total Ph.D. production in computing programs (Table D1, Figure D1) held steady in 2010-11, with 1,782 degrees granted compared with 1,772 last year with more departments reporting last year. Among departments reporting both this year and last year, the number of total doctoral degrees increased 5.2 percent.

Next year, the departments predict an increase of nearly 9 percent in

Figure 1. Number of Respondents to the Taulbee Survey

Year	US CS Depts.	US CE Depts.	Canadian	US Information	Total
1995	110/133 (83%)	9/13 (69%)	11/16 (69%)		130/162 (80%)
1996	98/131 (75%)	8/13 (62%)	9/16 (56%)		115/160 (72%)
1997	111/133 (83%)	6/13 (46%)	13/17 (76%)		130/163 (80%)
1998	122/145 (84%)	7/19 (37%)	12/18 (67%)		141/182 (77%)
1999	132/156 (85%)	5/24 (21%)	19/23 (83%)		156/203 (77%)
2000	148/163 (91%)	6/28 (21%)	19/23 (83%)		173/214 (81%)
2001	142/164 (87%)	8/28 (29%)	23/23 (100%)		173/215 (80%)
2002	150/170 (88%)	10/28 (36%)	22/27 (82%)		182/225 (80%)
2003	148/170 (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	151/181 (83%)	12/32 (38%)	20/30 (67%)	9/19 (47%)	192/264 (73%)
2009	147/184 (80%)	13/31 (42%)	16/30 (53.3%)	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%)

Figure D1. PhD Production
CRA Taulbee Survey 2011

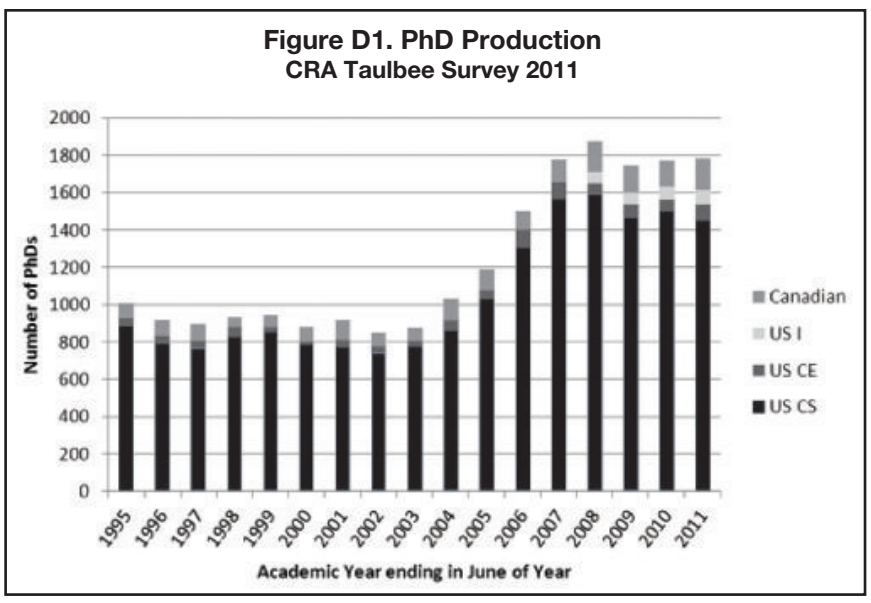

Table D1. PhD Production and Pipeline by Department Type

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

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Table D2. 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 D3. 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 D4. 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: Biomedica/ 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	3	1	4	7	6	13	102	7.1%
Researcher	6	1	4	6	1	1	0	6	2	0	2	7	2	2	2	3	1	3	7	17	73	5.1%
Postdoc	38	1	12	17	4	12	0	20	7	5	2	12	7	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	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	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	25	6	12	86	32	83	676	47.2%
Government	7	0	5	2	6	2	5	3	8	1	2	1	0	0	2	4	1	4	2	5	60	4.2%
Self-Employed	0	0	0	1	0	1	0	1	0	0	2	2	2	0	1	0	0	1	1	1	13	0.9%
Unemployed	2	0	2	1	2	2	1	0	2	0	1	3	0	0	1	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	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	26	118	85	178	1,275	89.0%
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	2.4%
Researcher in PhD	1	0	1	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	1	3	11	0.8%
Postdoc in PhD	8	0	2	1	2	1	0	2	0	0	1	0	1	1	4	0	0	3	6	3	35	2.4%
Teaching in PhD	1	0	1	0	0	0	0	1	1	0	2	1	0	0	0	0	1	1	0	0	9	0.6%
Other Academic	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	2	8	0.6%
Industry	0	0	4	5	1	0	1	2	1	1	0	13	1	1	1	0	1	4	2	7	45	3.1%
Government	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	1	0	1	0	1	7	0.5%
Other	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	7	0.5%
Total Outside NA	16	0	14	9	7	2	3	8	8	3	5	20	3	2	5	2	3	14	12	21	157	11.0%
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	

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doctoral degree production, but they notoriously over-predict the number of Ph.D. graduates. A more realistic forecast for next year's production is one comparable to that for this year.

The number of new students per department passing qualifier and thesis candidacy exams in U.S. CS departments (most, but not all, departments have such exams) increased this year. This suggests that the number of doctoral degrees produced will increase in the near term.

The number of new Ph.D. students overall (Table D5) is somewhat less than last year (2,812 this year vs. 2,962 last year). However, on a per department basis, this total is comparable to that of last year. The number of new students in CE and I programs also are similar to last year's figures. There was a slight decline in the proportion of new doctoral students from outside North America (Table D5a), from 56.8 percent last year to 56.3 percent this year. Total enrollment in computer science doctoral programs (Table D6) is comparable to that of last year, after accounting for the decreased number of departments reporting this year. However, total enrollment by Non-resident Aliens is higher in all three computing areas, and the overall level is now at 57.3 percent vs. 51.0 percent last year (Table D8 and Figure D2).

Table D5. New PhD Students by Department Type

Department Type	CS				CE				I				Total	
	New Admit	MS to PhD	Total	Avg. per Dept.	New Admit	MS to PhD	Total	Avg. per Dept.	New Admit	MS to PhD	Total	Avg. per Dept.	Total	Avg. per Dept
US CS Public	1,508	167	1,675	16.1	84	18	102	1.0	77	4	81	0.8	1,858	17.9
US CS Private	526	53	579	16.1	20	0	20	0.6	7	1	8	0.2	607	16.9
US CS Total	2,034	220	2,254	16.1	104	18	122	0.9	84	5	89	0.6	2,465	17.6
US CE	0	0	0	0.0	57	13	70	5.8	0	0	0	0.0	70	5.8
US Information	0	0	0	0.0	0	0	0	0.0	103	9	112	8.6	112	8.6
Canadian	126	21	147	11.3	18	0	18	1.4	0	0	0	0.0	165	12.7
Grand Total	2,160	241	2,401	13.5	179	31	210	1.2	187	14	201	1.1	2,812	15.8

Table D5a. New PhD Students from Outside North America

Department Type	CS	CE	I	Total New Outside	Total New	% outside North America
US CS Public	1,041	58	30	1,129	1,858	60.8%
US CS Private	267	7	6	280	607	46.1%
Total US CS	1,308	65	36	1,409	2,465	57.2%
US CE	0	41	0	41	70	58.6%
US Info	0	0	47	47	112	42.0%
Canadian	73	5	9	87	165	52.7%
Grand Total	1,381	111	92	1,584	2,812	56.3%

Table D6. PhD Enrollment by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	104	8,358	70.0%	680	39.1%	378	38.0%	9,416	64.2%
US CS Private	36	2,514	21.1%	174	10.0%	10	1.0%	2,698	18.4%
Total US CS	140	10,872	91.1%	854	49.1%	388	39.0%	12,114	82.6%
US CE	12	0	0.0%	789	45.3%	0	0.0%	789	5.4%
US Info	13	0	0.0%	0	0.0%	606	61.0%	606	4.1%
Canadian	13	1,065	8.9%	97	5.6%	0	0.0%	1,162	7.9%
Grand Total	178	11,937		1,740		994		14,671	

Table D7. PhD Enrollment by Gender

	CS		CE		I		Total	
Male	9,745	81.6%	1483	85.2%	604	60.8%	11,832	80.7%
Female	2,191	18.4%	257	14.8%	389	39.2%	2,837	19.3%
Total Known Gender	11,936		1,740		993		14,669	
Gender Unknown	1		0		1		2	
Grand Total	11,937		1,740		994		14,671	

Table D8. PhD Enrollment by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	5,978	56.1%	1152	74.0%	402	42.9%	7,532	57.3%
Amer Indian or Alaska Native	50	0.5%	0	0.0%	2	0.2%	52	0.4%
Asian	897	8.4%	79	5.1%	85	9.1%	1,061	8.1%
Black or African-American	172	1.6%	27	1.7%	49	5.2%	248	1.9%
Native Hawaiian/Pac Islander	11	0.1%	0	0.0%	16	1.7%	27	0.2%
White	3367	31.6%	278	17.9%	357	38.1%	4,002	30.4%
Multiracial, not Hispanic	31	0.3%	4	0.3%	2	0.2%	37	0.3%
Hispanic, any race	149	1.4%	16	1.0%	25	2.7%	190	1.4%
Total Known	10,655		1,556		938		13,149	
Resident, ethnicity unknown	474		112		43		629	
Residency unknown	808		72		13		893	
Grand Total	11,937		1,740		994		14,671	

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Approximately 73 percent of the doctoral degrees at U.S. CS departments are granted by public universities, though the average per department is similar at public and private universities. A similar fraction of new students (74 percent) are at public universities, while a larger fraction of new students from outside North America (approximately 80 percent) are at the public universities. At public universities, there are more students per tenure-track faculty and more degrees are given per tenure-track faculty member in larger departments, while at private universities there is less variability as department size increases (Figures D3 and D4.

Figure D5 shows a graphical view of the Ph.D. pipeline for computer science programs. The data in this graph are normalized by the number of departments reporting. The graph offsets the qualifier data by one year from the data for new students, and offsets the graduation data by five years from the data for new students. These data have been useful in estimating the timing of changes in production rates.

Figure D6 shows the employment trend of new Ph.D.s in academia and industry, those taking employment outside of North America, and those going to academia who took positions in departments other than Ph.D.-granting CS/CE departments. Table D4 shows a more detailed breakdown of the employment data for new Ph.D.s. There was an increase in the fraction of new Ph.D.s who took positions in industry (to 47.2 percent vs. 44.7 percent in 2009-10). The 2010-11 level is about the same as that in 2008-09. A smaller fraction of graduates took academic jobs in 2010-11 as compared with 2009-10. The fraction taking tenure-track positions in doctoral-granting institutions dropped from 8.2 percent in 2009-10 to 7.1 percent in 2010-11; however, the fraction taking positions in non-Ph.D.-granting departments increased to 3.6 percent from 2.4 percent. The fraction taking postdoctoral positions also declined, to 16.8 percent from 19.5 percent, but the fraction taking researcher positions at doctoral-granting institutions increased from 3.4 percent to 5.1 percent.

The unemployment rate for new Ph.D.s rose somewhat this year, to 1.6 percent from 1.1 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 slightly to 11.0 percent from 11.8 percent in 2009-10.

This year, there was a larger fraction of new Ph.D.s whose employment status was unknown (19.6 percent vs. 15.1 percent last year). It is possible that this skews the real overall percentages for certain employment categories.

Table D4 also indicates the areas of specialty of new Ph.D.s. 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.

A similar fraction of this year's computer science graduates were women (18.4 percent vs. 18.8 percent in 2009-10), a smaller fraction of this year's I graduates were women (32.5 percent vs. 40.2 percent in 2009-10) and a larger fraction of this year's 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 in I departments, 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 specific departments reporting this year.[5]

Master's and Bachelor's Degree Production and Enrollments

This section reports data about enrollment and degree production for Master's and Bachelor's programs in the doctoral-granting departments. Although the absolute number of degrees and students enrolled reported herein only reflect departments that offer the doctoral degree, the trends observed in the master's and bachelor's data from

Figure D2. Nonresident Aliens as Fraction of PhD Enrollments
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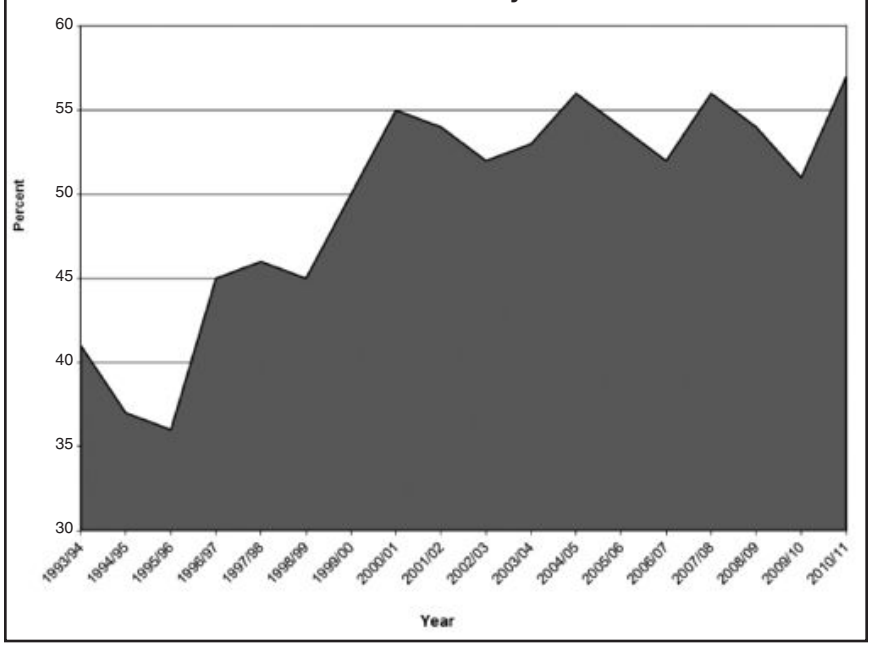


Figure D3. PhD Degrees Granted by Tenure-Track Size
CRA Taulbee Survey 2011

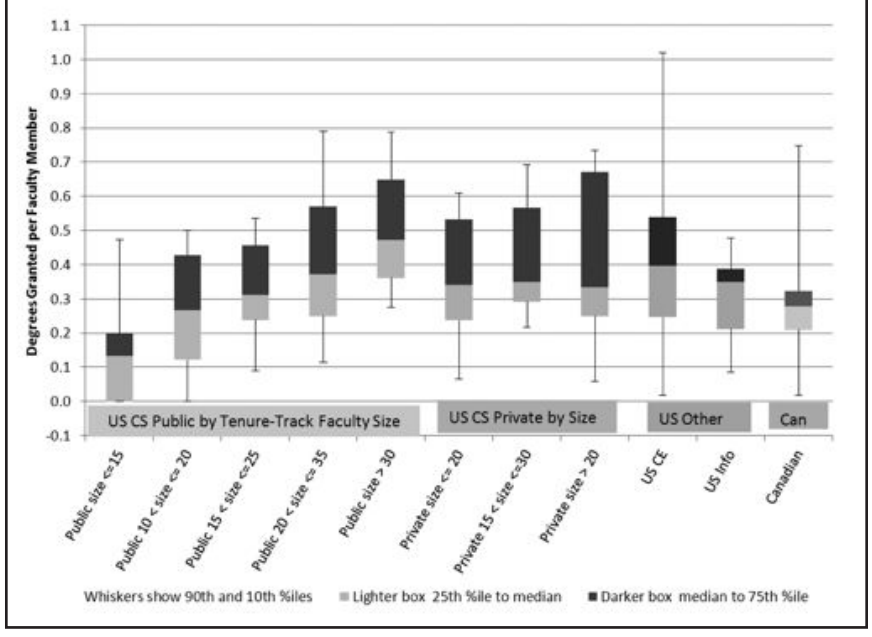


Figure D4. PhD Enrollment Normalized by Tenure-Track Size
CRA Taulbee Survey 2011

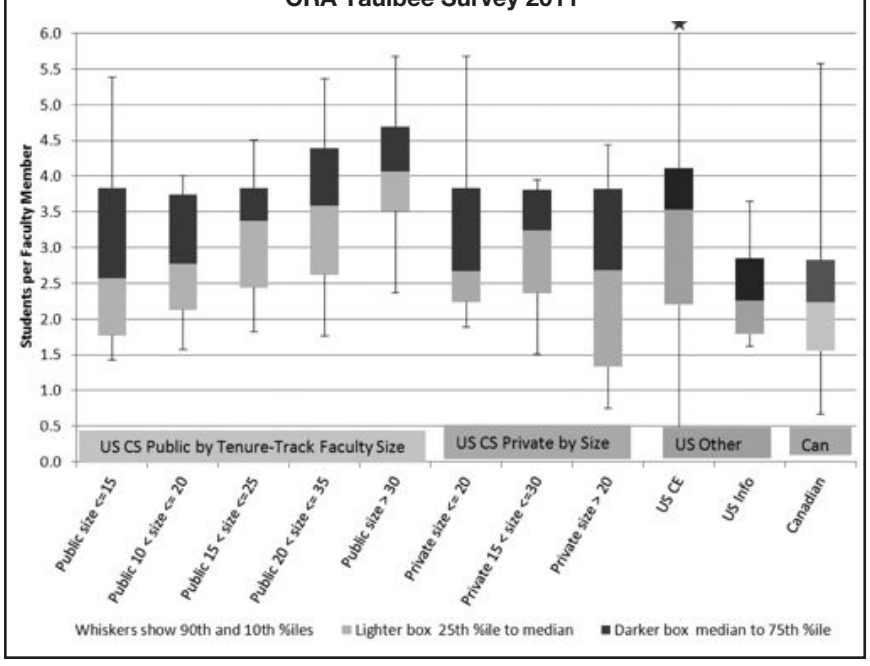


Figure D5. CS Pipeline corrected for year of entry

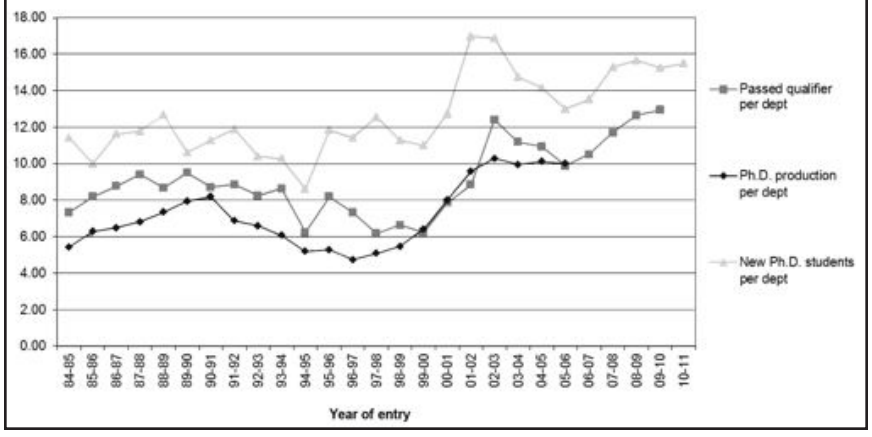
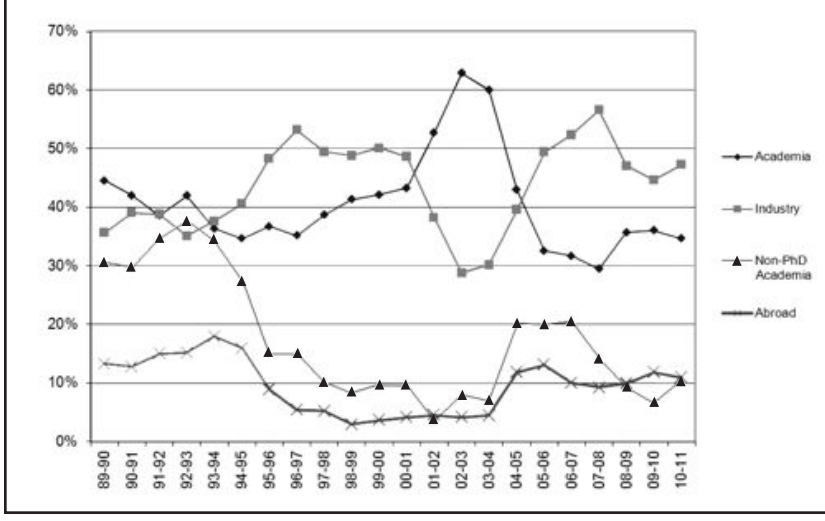


Figure D6. Employment of New PhD's in US and Canada



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these departments tend to strongly reflect trends in the larger population of programs that offer such degrees.

Master's (Tables M1-M6; Figures M1-M2)

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 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 compared with last year (56.2 percent vs. 51.2 percent last year).

Despite the neutral to increasing data for new master's students, the number of master's degrees expected next year is less in all three computing areas (CS, CE and I). Total enrollment in master's programs is

Table M1. 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 M2. 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 M3. 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 M4. Master's Degrees Expected Next Year by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	104	3,491	60.8%	365	37.6%	423	20.6%	4,279	48.8%
US CS Private	37	1,918	33.4%	120	12.4%	327	15.9%	2,365	27.0%
Total US CS	141	5,409	94.3%	485	49.9%	750	36.5%	6,644	75.8%
US CE	12	0	0.0%	484	49.8%	0	0.0%	484	5.5%
US Info	13	0	0.0%	0	0.0%	1303	63.5%	1,303	14.9%
Canadian	13	329	5.7%	2	0.2%	0	0.0%	331	3.8%
Grand Total	179	5,738		971		2,053		8,762	

Table M5. New Master's Students by Department Type

Department Type	CS			CE			I			Total			Outside North America	
	Total	# Depts	Avg / Dept	Total	# Depts	Avg / Dept	Total	# Dept	Avg / Dept	Total	# Dept	Avg / Dept	Total	%
US CS Public	3,028	99	30.6	246	22	11.2	299	10	29.9	3,573	99	36.1	2319	64.9%
US CS Private	2,229	35	63.7	110	6	18.3	284	4	71.0	2,623	35	74.9	1469	56.0%
Total US CS	5,257	134	39.2	356	28	12.7	583	14	41.6	6,196	134	46.2	3,788	61.1%
US CE	0	0		313	9	34.8	0	0		313	9	34.8	268	85.6%
US Info	0	0		0	0		1141	12	95.1	1,141	12	95.1	241	21.1%
Canadian	353	12	29.4	26	2	13.0	0	0		379	12	31.6	212	55.9%
Grand Total	5,610	146	38.4	695	39	17.8	1,724	26	66.3	8,029	167	48.1	4,509	56.2%

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down compared with last year, so the expectation for fewer degrees in the coming year is consistent with the total enrollment trend.

About two-thirds of the total master's graduates from U.S. CS departments came from public institutions. A slightly smaller proportion of total master's students (63 percent) attend public universities, and an even smaller proportion of new master's students (about 58 percent) attend universities. These fractions are smaller than their doctoral level counterparts. There appears to be no strong correlation among U.S. CS departments, either public or private, between department size and master's enrollment or degree production per tenure-track faculty member (Figures M1 and M2).

Bachelor's (Tables B1-B6; Figures B1-B4)

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 that reported both years are counted, the increase was 12.9 percent. Similar increases hold in U.S. CS departments (10.5 percent overall and 12.9 percent among those departments who reported both years).

The number of new computing majors among U.S. CS 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).

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 computer science departments and schools of information 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 departments are more

Table M6. 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

Figure M1. Master's Degrees Granted by Tenure-Track Size
CRA Taulbee Survey 2011

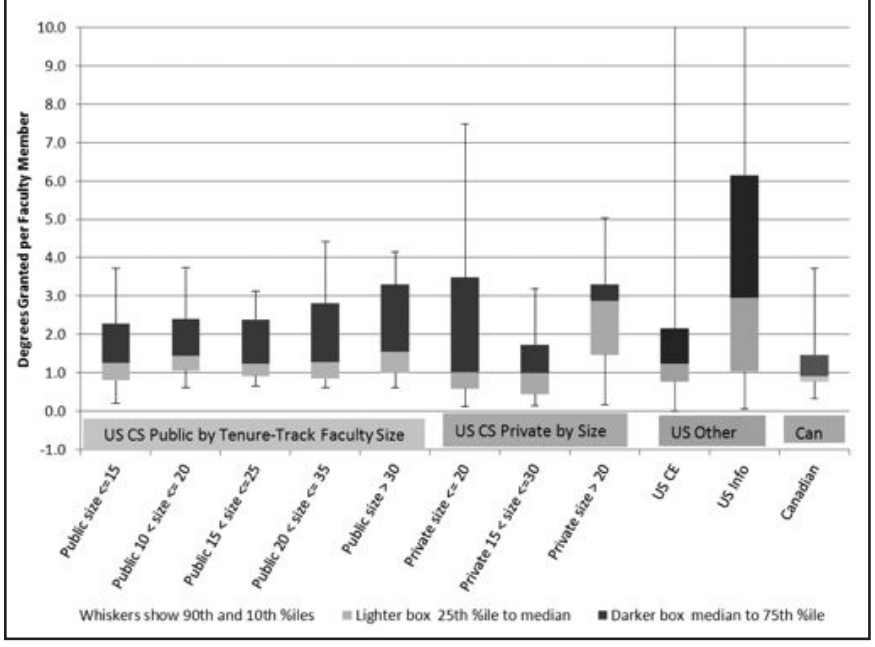

Figure M2. Master's Enrollment Normalized by Tenure-Track Size
CRA Taulbee Survey 2011

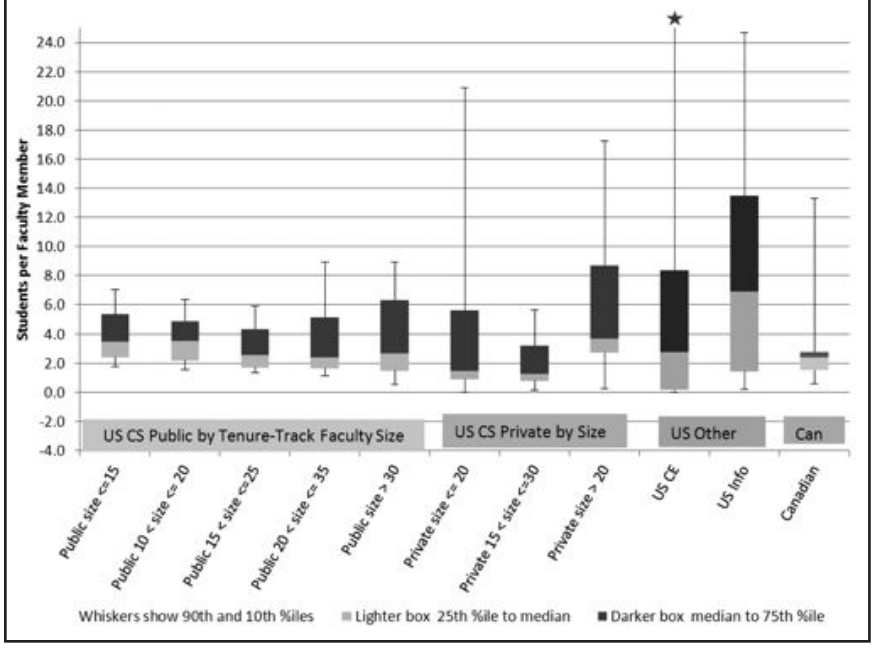

Table B1. Bachelor's Degrees Awarded by Department Type

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 B2. 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	

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volatile due to the small number reporting in each of these areas.

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.

Among U.S. CS departments, between 78 and 80 percent of the total bachelor's degrees, new bachelor's students and total bachelor's students are from public universities. These levels are higher than their master's and doctoral level counterparts in all cases except new bachelor's students, where they are approximately the same as for new doctoral students.

Larger U.S. CS departments tend to grant more bachelor's degrees per tenure-track faculty member, and public universities tend to grant more bachelor's degrees per tenure-track faculty member than do private universities. While private universities also have higher enrollments per tenure-track faculty member in larger departments, public universities exhibit a less clear trend in enrollment per tenure-track faculty as department size increases (Figures B3 and B4).

Table B3. 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 B4. Bachelor's Degrees Expected Next Year by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	99	6,497	63.5%	1238	65.3%	780	33.6%	8,515	59.0%
US CS Private	34	2,104	20.6%	250	13.2%	387	16.7%	2,741	19.0%
Total US CS	133	8,601	84.1%	1488	78.5%	1167	50.3%	11,256	77.9%
US CE	10	0	0.0%	287	15.1%	0	0.0%	287	2.0%
US Info	9	0	0.0%	0	0.0%	1126	48.6%	1,126	7.8%
Canadian	13	1,628	15.9%	121	6.4%	26	1.1%	1,775	12.3%
Grand Total	165	10,229		1,896		2,319		14,444	

Table B5. New Bachelor's Students by Department Type

Department Type	CS				CE				I				Total	
	Major	Pre-major	# Dept	Avg. Major per Dept.	Major	Pre-major	# Dept	Avg. Major per Dept.	Major	Pre-major	# Dept	Avg. Major per Dept.	Total Major	Avg. Major per Dept.
US CS Public	8,237	3080	98	84.1	1583	391	33	48.0	931	117	22	42.3	10,751	109.7
US CS Private	2073	303	34	61.0	219	5	9	24.3	357	6	5	71.4	2,649	77.9
US CS Total	10,310	3383	132	78.1	1802	396	42	42.9	1288	123	27	47.7	13,400	101.5
US CE	0	0	0	0.0	262	181	9	29.1	0	0	0	0.0	262	29.1
US Information	0	0	0	0.0	0	0	0	0.0	533	348	8	66.6	533	66.6
Canadian	2010	474	13	154.6	74	0	3	24.7	0	0	0	0.0	2,084	160.3
Grand Total	12,320	3,857	145	85.0	2,138	577	54	39.6	1,821	471	35	52.0	16,279	100.5

Table B6. 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

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Figure B1. BS Production (CS & CE)

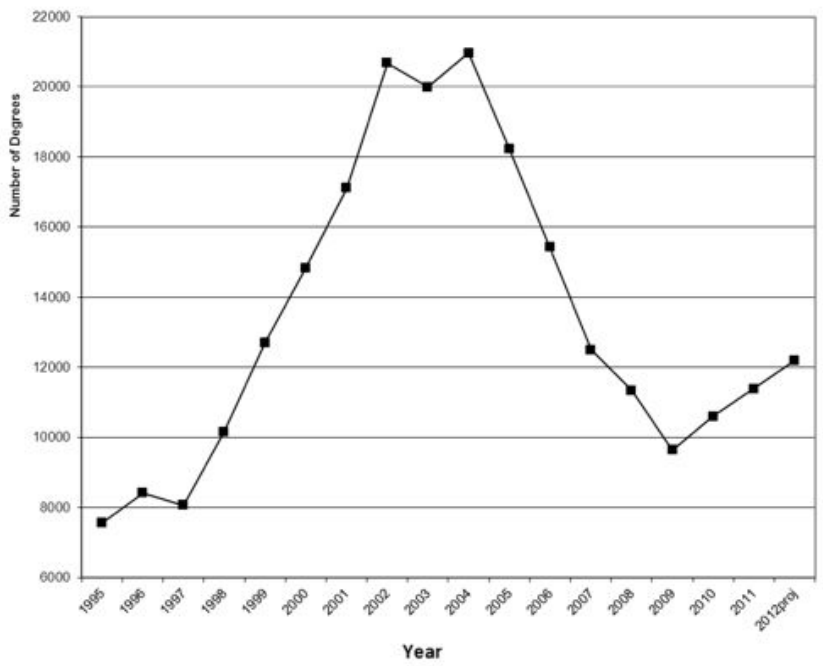


Figure B2. Newly Declared CS/CE Undergraduate Majors

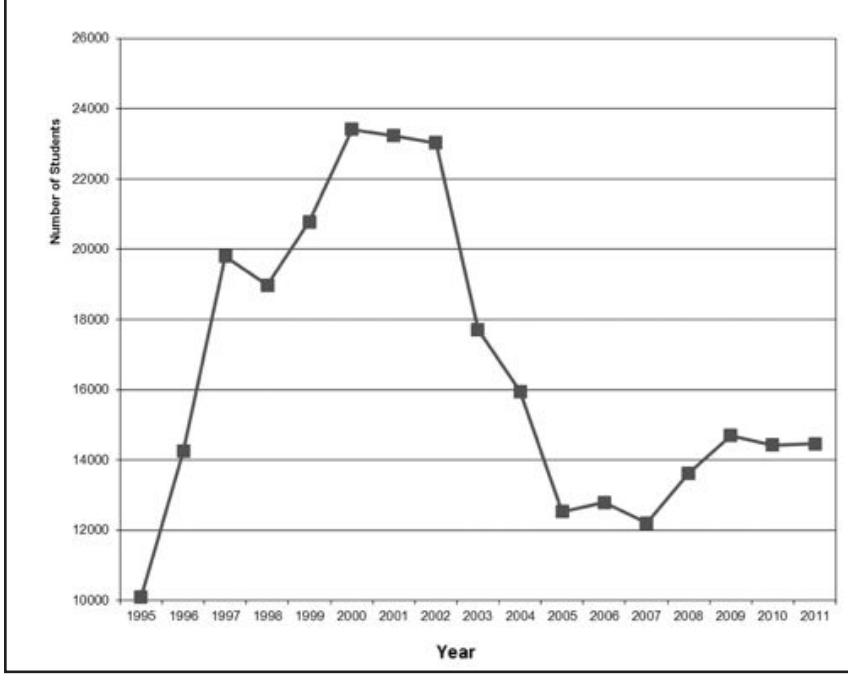


Figure B3. Bachelor's Degrees Granted by Tenure-Track Size
CRA Taulbee Survey 2011

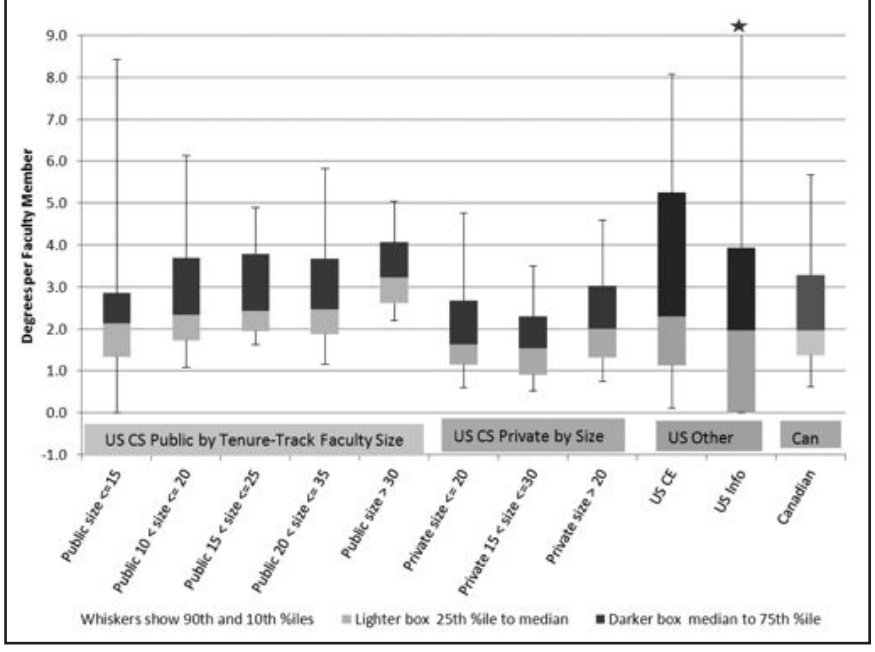
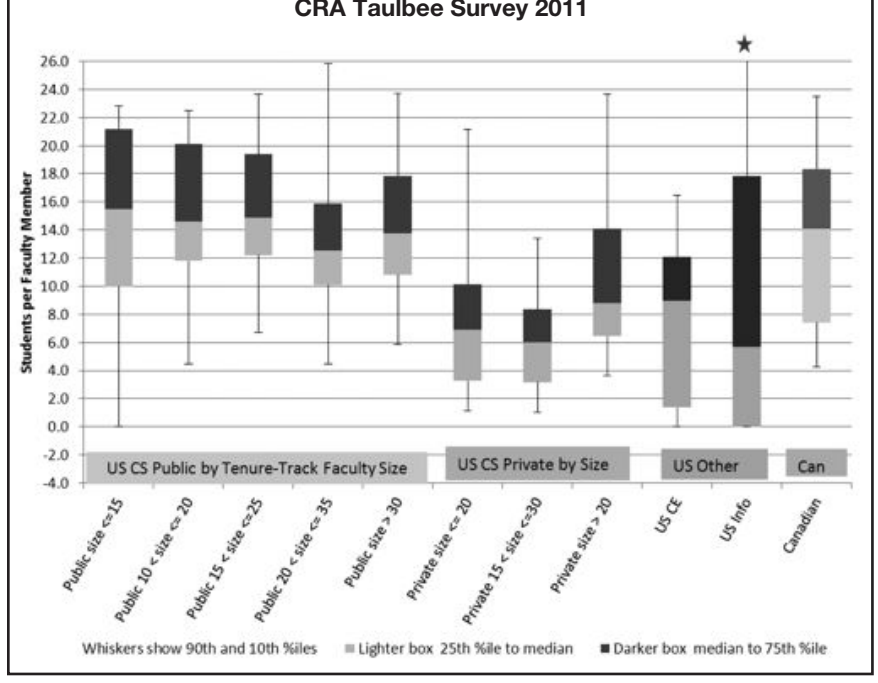


Figure B4. Bachelor's Enrollment Normalized by Tenure-Track Size
CRA Taulbee Survey 2011



CRA-W Graduate Cohort Meeting Bellevue, Washington

April 13–14, 2012

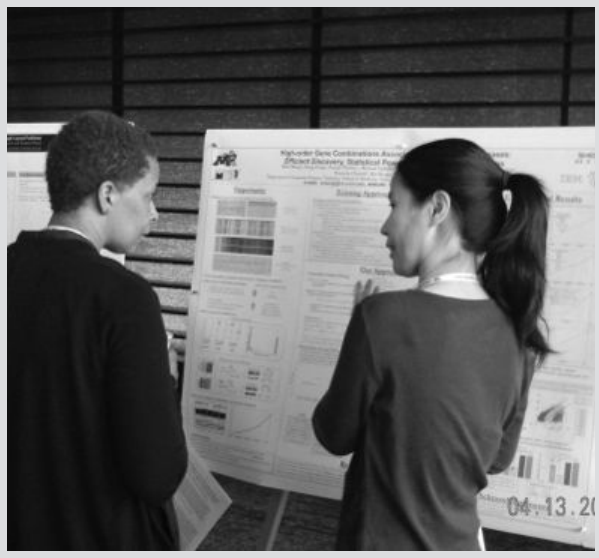
POSTER SESSIONS

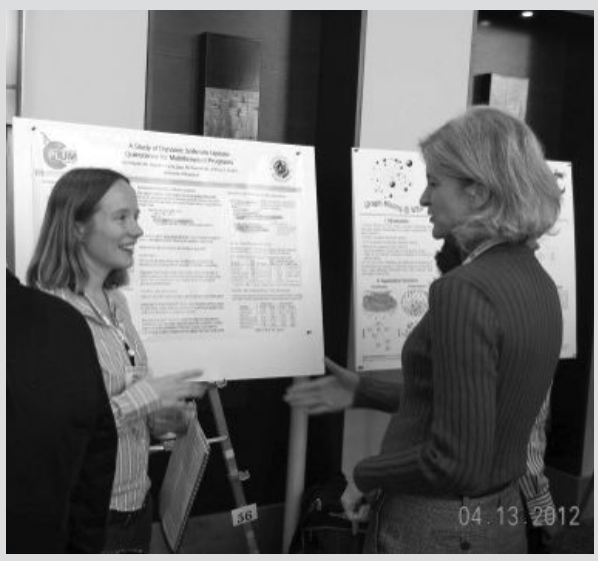
Top left: Pictured at the recent Grad Cohort meeting (l to r) are **Piyali Dey** (North Carolina State University), Grad Cohort Co-Chair **Lori Clarke** (UMass), and **Bushra Anjum** (North Carolina State University).

Top right: **Wen Wang,** University of Minnesota-Twin Cities, discusses her poster with a Cohort attendee.

Bottom left: **Karla Saur** (left), University of Maryland-College Park, talks with conference speaker **Kathryn McKinley** from Microsoft Research during the poster session.

Bottom right: **Rasna Walia,** Iowa State University, in conversation with another Cohort attendee about her poster.





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Faculty Demographics (Tables F1-F7)[6]

Table F1 shows the current and anticipated sizes, in FTE, for tenure-track, teaching and research faculty, and postdocs. In U.S. CS departments, the total tenure-track faculty count of 3,455 is about 6 percent lower than that of last year, but this is consistent with the decrease in the number of departments reporting this year. Canadian departments also showed a significant decrease in faculty numbers due to the decreased number of departments reporting. U.S. CE departments showed a decrease in total tenure-track faculty count despite a slight increase in the number of departments reporting, but this reflects a correction in some ECE departments to better separate EE from CE faculty. U.S. I departments showed an overall increase in faculty numbers, consistent with their increased number of departments reporting. Total counts of teaching and research faculty and of postdocs are similar to those for last year despite the decreased number of departments reporting.

Among U.S. CS departments, the average tenure-track faculty size is slightly larger at private universities than at public universities. Canadian universities, on average, have more tenure-track faculty members per department than do U.S. universities, while on average U.S. I departments are smaller than U.S. CS departments and U.S. CE departments are smaller still. These last two may reflect the fact that we ask departments to report only computing-related faculty, so departments with Library Science or EE programs may report only part of their faculty.

Private universities also tend to have more research faculty and postdocs than do public universities on average, though the teaching faculty per department is similar in public and private universities. Canadian departments have more teaching faculty than do U.S. departments, and have roughly the same number of postdocs per department as do private U.S. CS departments. U.S. I departments have slightly more teaching faculty as compared with U.S. CS departments, but have research faculty and postdoc averages more in line with U.S. CS departments at public universities. U.S. CE departments are smaller than their U.S. CS departments in all categories.

Table F2 summarizes faculty hiring this past year. There were 245 tenure-track vacancies reported in 2010-11 vs. 211 in 2009-10 with more departments reporting in 2009-10. Of these vacant positions, 37.6 percent were reported unfilled, higher than the 29.9 percent in 2009-10. Public and private universities had similar success rates, but the overall U.S. CS success rate was only around 60 percent, while U.S. CE, U.S. I, and Canadian departments did much better. For the first time, we report in Table F2a the reasons why positions went unfilled. We will examine trends on this in subsequent survey reports.

The fraction of women hired into tenure-track positions (Table F3) fell

Table F1. Actual and Anticipated Faculty Size by Position and Department Type

	Actual 2011-2012		Projected 2012-2013		Projected 2013-2014		Expected 2-Yr Growth	
US CS Public	Total	Average	Total	Average	Total	Average	#	%
TenureTrack	2,485	24.9	2,530	25.3	2,608	26.1	123	4.9%
Teaching	375	3.8	349	3.5	361	3.6	-14	-3.7%
Research	249	2.5	279	2.8	299	3.0	50	20.1%
Postdoc	284	2.8	325	3.3	348	3.5	64	22.5%
Total	3,393	33.9	3,483	34.8	3,616	36.2	223	6.6%
US CS Private								
TenureTrack	970	26.9	1,012	28.1	1,043	29.0	73	7.5%
Teaching	146	4.1	151	4.2	154	4.3	8	5.5%
Research	138	3.8	141	3.9	145	4.0	7	5.1%
Postdoc	238	6.6	267	7.4	282	7.8	44	18.5%
Total	1,492	41.4	1,571	43.6	1,624	45.1	132	8.8%
All US CS								
TenureTrack	3,455	25.4	3,542	26.0	3,651	26.8	196	5.7%
Teaching	521	3.8	500	3.7	515	3.8	-6	-1.2%
Research	387	2.8	420	3.1	444	3.3	57	14.7%
Postdoc	522	3.8	592	4.4	630	4.6	108	20.7%
Total	4,885	35.9	5,054	37.2	5,240	38.5	355	7.3%
US CE								
TenureTrack	157	14.3	162	14.7	165	15.0	8	5.1%
Teaching	16	1.5	17	1.5	19	1.7	3	18.8%
Research	13	1.2	15	1.4	17	1.5	4	30.8%
Postdoc	19	1.7	19	1.7	22	2.0	3	15.8%
Total	205	18.6	213	19.4	223	20.3	18	8.8%
US I								
TenureTrack	267	20.5	288	22.2	301	23.2	34	12.7%
Teaching	60	4.6	63	4.8	64	4.9	4	6.7%
Research	33	2.5	36	2.8	39	3.0	6	18.2%
Postdoc	31	2.4	37	2.8	37	2.8	6	19.4%
Total	391	30.1	424	32.6	441	33.9	50	12.8%
Canadian								
TenureTrack	487	37.5	497	38.2	502	38.6	15	3.1%
Teaching	72	5.5	73	5.6	73	5.6	1	1.4%
Research	14	1.1	14	1.1	14	1.1	0	0.0%
Postdoc	84	6.5	78	6.0	78	6.0	-6	-7.1%
Total	657	50.5	662	50.9	667	51.3	10	1.5%
Grand Total								
TenureTrack	4,366	25.2	4,489	25.9	4,619	26.7	253	5.8%
Teaching	669	3.9	653	3.8	671	3.9	2	0.3%
Research	447	2.6	485	2.8	514	3.0	67	15.0%
Postdoc	656	3.8	726	4.2	767	4.4	111	16.9%
Total	6,138	35.5	6,353	36.7	6,571	38.0	433	7.1%

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Table F2. Vacant Positions 2010-2011 by Position and Department Type

	Tried to fill	Filled	Unfilled	% Unfilled
US CS Public				
TenureTrack	120	70	50	41.7%
Teaching	81	72	9	11.1%
Research	92	83	9	9.8%
Postdoc	123	107	16	13.0%
Total	416	332	84	20.2%
US CS Private				
TenureTrack	84	52	32	38.1%
Teaching	34	33	1	2.9%
Research	29	28	1	3.4%
Postdoc	75	74	1	1.3%
Total	222	187	35	15.8%
All US CS				
TenureTrack	204	122	82	40.2%
Teaching	115	105	10	8.7%
Research	121	111	10	8.3%
Postdoc	198	181	17	8.6%
Total	638	519	119	18.7%
US CE				
TenureTrack	17	12	5	29.4%
Teaching	11	11	0	0.0%
Research	10	10	0	0.0%
Postdoc	4	4	0	0.0%
Total	42	37	5	11.9%
US I				
TenureTrack	16	12	4	25.0%
Teaching	5	5	0	0.0%
Research	27	26	1	3.7%
Postdoc	20	17	3	15.0%
Total	68	60	8	11.8%
Canadian				
TenureTrack	8	7	1	12.5%
Teaching	1	0	1	100.0%
Research	0	0	0	0.0%
Postdoc	16	16	0	0.0%
Total	25	23	2	8.0%
Grand Total				
TenureTrack	245	153	92	37.6%
Teaching	132	121	11	8.3%
Research	158	147	11	7.0%
Postdoc	238	218	20	8.4%
Total	773	639	134	17.3%

sharply in 2010-11, to 21.3 percent from 26.5 percent in 2009-10. The 2010-11 level is similar to that of 2007-08. However, this year's fraction of new female hires still outpaces the 18.4 percent of new female Ph.D.s produced this past year. The fraction of women among new teaching faculty also fell this year compared with 2009-10. However, the fraction of women among new postdocs rose again this year, from 19.5 percent to 23.6 percent. This year there was a large increase in the percentage of new faculty members whose race/ethnicity is unknown (to 25.2 percent from 5.6 percent). This makes race/ethnicity comparisons with last year less reliable (Table F4).

There was a slight increase in the overall number of faculty losses this year, due to an increased number of persons taking positions elsewhere (either academic or nonacademic). No significant change in retirements is yet evident (Table F5).

This year there was an increase in the overall fraction of women at the associate professor rank (Table F6), to 17.9 percent from 15.9 percent last year. The overall fraction of female assistant professors dropped slightly, from 25.8 percent to 25.3 percent, and the overall fraction of full professors held steady (12.7 percent). The overall fraction of women among teaching faculty is slightly lower this year (27.0 percent vs. 27.8 percent), while the fraction of women among both research faculty and postdocs is quite a bit higher this year (24.2 percent vs. 19.0 percent for research faculty and 21.1 percent vs. 15.8 percent for postdocs). For the second year in a row, there is a larger fraction of Whites and a smaller fraction of Asians and Non-resident Aliens among current assistant professors this year compared with last year (Table F7).

For next year, reporting departments forecast a 2.8 percent growth in tenure-track faculty, similar to what was forecast last year. The largest forecast growth is in U.S. I departments. Departments overall also forecast a large increase in postdocs

Table F2a. Reasons Positions Left Unfilled

Reason	# Reported	% of Reasons
Didn't find a good fit	30	36.6%
Offers turned down	28	34.1%
Technically vacant, not filled for admin reasons	14	17.1%
Hiring in progress	8	9.8%
Other	2	2.4%
Total Reasons Provided	82	

Table F5. Faculty Losses

Died	8
Retired	67
Took Academic Position Elsewhere	52
Took Nonacademic Position	34
Remained, but Changed to Part Time	12
Other	36
Unknown	4
Total	213

Table F3. Gender of Newly Hired Faculty

	Tenure-Track		Teaching		Research		Postdoc		Total	
Male	203	78.7%	61	75.3%	51	85.0%	110	76.4%	425	78.3%
Female	55	21.3%	20	24.7%	9	15.0%	34	23.6%	118	21.7%
Unknown	0		0		0		0		0	
Total	258		81		60		144		543	

Table F4. Ethnicity of Newly Hired Faculty

	Tenure-Track		Teaching		Research		Postdoc		Total	
Nonresident Alien	34	13.6%	8	10.0%	11	18.3%	51	35.7%	104	19.5%
American Indian / Alaska Native	2	0.8%	2	2.5%	1	1.7%	0	0.0%	5	0.9%
Asian	40	16.0%	6	7.5%	8	13.3%	29	20.3%	83	15.6%
Black or African-American	6	2.4%	2	2.5%	1	1.7%	2	1.4%	11	2.1%
Native Hawaiian/ Pacific Islander	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
White	98	39.2%	58	72.5%	31	51.7%	41	28.7%	228	42.8%
Multiracial, not Hispanic	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Hispanic, any race	7	2.8%	1	1.3%	2	3.3%	8	5.6%	18	3.4%
Resident, race/ethnic unknown	63	25.2%	3	3.8%	6	10.0%	12	8.4%	84	15.8%
Total known residency	250	100.0%	80	100.0%	60	100.0%	143	100.0%	533	100.0%
Residency Unknown	8		1		0		1		10	
Total	258		81		60		144		543	

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(more than 10 percent), and a healthy 8.5 percent increase in research faculty for next year.

Research Expenditures (Table R1; Figures R1-R2)

Table R1 shows the department's total expenditure (including indirect costs or "overhead" as stated on project budgets) from external sources of support. Figures R1 and R2 show the per capita expenditure, where capitation is computed two ways. The first (Figure R1) is relative to the number of tenure-track faculty members. The second (Figure R2) is relative to researchers and postdocs as well as tenure-track faculty. Canadian levels are shown in Canadian dollars. The U.S. CS data for public institutions indicate that the larger the department, the more external funding is received by the department (both in total and per capita). Average research expenditures at private institutions are much less affected by the size of the department. Though the range at U.S. public universities is much greater than that at U.S. private universities, there is no difference in the median research expenditures overall among U.S. public and U.S. private universities.

Table F6. Gender of Current Faculty

	Full		Associate		Assistant		Teaching		Research		Postdoc		Total	
Male	1,837	87.3%	1,331	82.1%	602	74.7%	513	73.0%	373	75.8%	508	78.9%	5,164	81.0%
Female	268	12.7%	291	17.9%	204	25.3%	190	27.0%	119	24.2%	136	21.1%	1,208	19.0%
Unknown	0		0		0		0		1		1		2	
Total	2,105		1,622		806		703		493		645		6,374	

Table F7. Ethnicity of Current Faculty

	Full		Associate		Assistant		Teaching		Research		Postdoc		Total	
Nonresident Alien	12	0.6%	37	2.5%	97	12.7%	14	2.1%	86	19.1%	205	35.8%	451	7.6%
American Indian / Alaska Native	2	0.1%	4	0.3%	3	0.4%	7	1.1%	0	0.0%	3	0.5%	19	0.3%
Asian	415	21.0%	415	27.8%	196	25.7%	50	7.6%	57	12.7%	111	19.4%	1,244	21.0%
Black or African-American	12	0.6%	21	1.4%	23	3.0%	22	3.3%	3	0.7%	2	0.3%	83	1.4%
Native Hawaiian/ Pacific Islander	1	0.1%	3	0.2%	1	0.1%	0	0.0%	1	0.2%	0	0.0%	6	0.1%
White	1,446	73.2%	924	61.8%	393	51.5%	536	81.5%	262	58.2%	200	35.0%	3,761	63.6%
Multiracial, not Hispanic	3	0.2%	3	0.2%	0	0.0%	1	0.2%	1	0.2%	0	0.0%	8	0.1%
Hispanic, any race	33	1.7%	35	2.3%	25	3.3%	16	2.4%	13	2.9%	15	2.6%	137	2.3%
Resident, race/ ethnic unknown	51	2.6%	52	3.5%	25	3.3%	12	1.8%	27	6.0%	36	6.3%	203	3.4%
Total known residency	1,975	100%	1,494	100%	763	100%	658	100%	450	100%	572	100%	5,912	100%
Residency Unknown	130		128		43		45		43		73		462	
Total	2,105		1,622		806		703		493		645		6,374	

Table R1. Total Expenditure from External Sources for Computing Research

Department Type	# Depts	Percentile of Department Averages 10th	25th	50th	75th	90th
US CS Public	89	$353,575	$1,589,069	$3,985,530	$8,742,962	$14,174,188
US CS Private	34	$679,354	$2,207,404	$3,961,312	$6,794,415	$13,652,591
US CE	6			$2,254,241		
US Information	13	$672,550	$1,038,805	$3,418,272	$4,611,649	$10,886,456
Canadian	9			$1,268,200		

Figure R1. Research Expenditures Normalized by Tenure-Track Size
CRA Taulbee Survey 2011

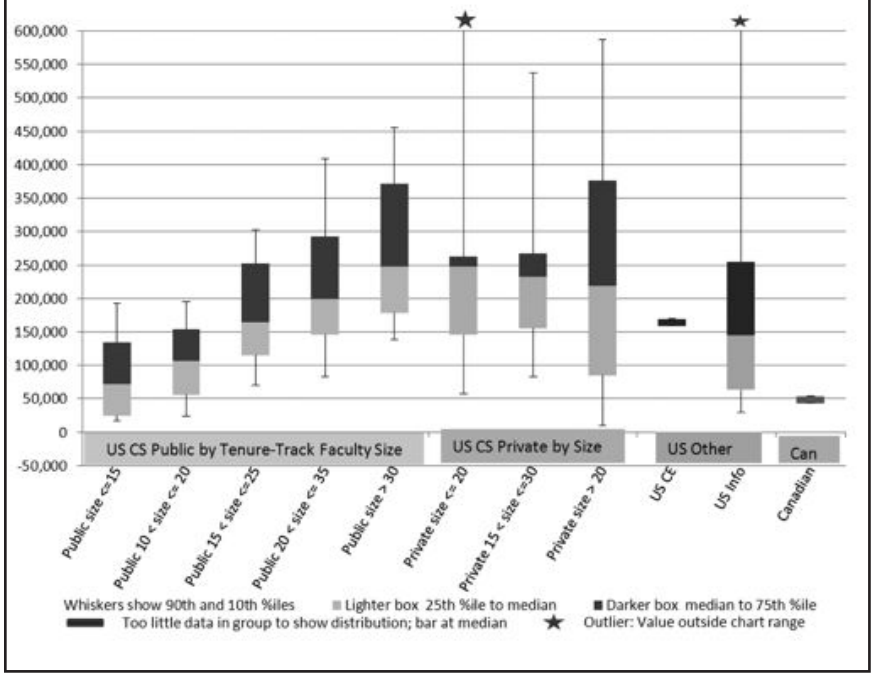
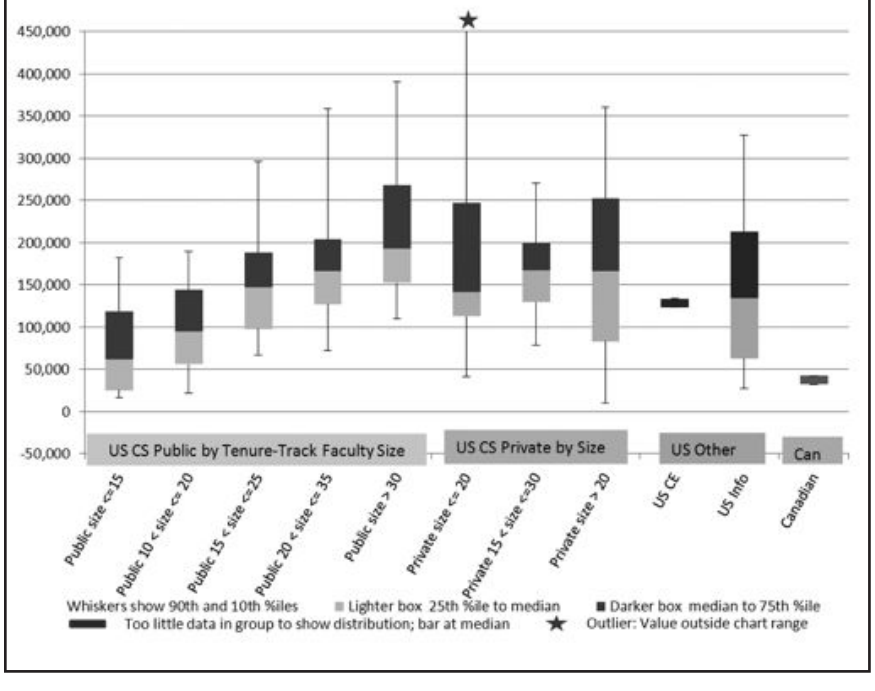


Figure R2. Research Expenditures Normalized by Tenure-Track + Research Faculty + Postdoctorates
CRA Taulbee Survey 2011



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Graduate Student Support (Tables G1-G2; Figures G1-G3)

Table G1 shows the number of graduate students supported as full-time students as of fall 2011, further categorized as teaching assistants (TAs), research assistants (RAs), and full-support fellows, and also shows the split between those on institutional vs. external funds. The number of TAs on institutional funds in CS departments decreased 3 percent this year, but this is a lower rate than the decrease in number of departments reporting. A similar situation exists in total RA support; this is coupled with a significant increase in the fraction of RAs supported on external funds. The number of full-support fellows rose with respect to both institutional fund and external fund support. U.S. CE and U.S. I programs each show significant drops in the number of supported RAs, despite an increased number of departments reporting this year. Canadian numbers are down as befits the decrease in number of departments reporting this year.

Table G2 shows the distribution of stipends for TAs, RAs, and full-support fellows. U.S. CS data are further broken down in this table by public and private institution, and the higher stipends at private institutions are evident. Figures G1-G3 further break down the U.S. CS data by the size of department and the geographic location of the university. Larger departments tend to offer higher stipends, though for full-support fellows this difference doesn't become very visible until the department size is above 20. Departments located in larger population centers also tend to pay higher stipends to TAs and RAs, as would be expected. The data for full-support fellows exhibit no clear trend relative to locale.

Table G1. Graduate Students Supported as Full-Time Students by Department Type

Department Type	# Dept	On Institutional Funds: Teaching Assistants		Research Assistants		Full-Support Fellows		On External Funds: Teaching Assistants		Research Assistants		Full-Support Fellows		Total
US CS Public	100	2,246	31.1%	753	10.4%	288	4.0%	7	0.1%	3,616	50.0%	319	4.4%	7,229
US CS Private	36	729	24.7%	286	9.7%	207	7.0%	17	0.6%	1,489	50.5%	223	7.6%	2,951
US CS Total	136	2,975	29.2%	1,039	10.2%	495	4.9%	24	0.2%	5,105	50.1%	542	5.3%	10,180
US CE	11	75	29.2%	12	4.7%	7	2.7%	0	0.0%	157	61.1%	6	2.3%	257
US I	13	82	28.1%	93	31.8%	16	5.5%	0	0.0%	76	26.0%	25	8.6%	292
Canadian	13	311	31.5%	210	21.3%	154	15.6%	0	0.0%	217	22.0%	95	9.6%	987
Grand Total	173	3,443	29.4%	1,354	11.6%	672	5.7%	24	0.2%	5,555	47.4%	668	5.7%	11,716

Table G2. Fall 2011 Academic-Year Graduate Stipends by Department Type and Support Type

Teaching Assistantships

Department Type	# Depts	Percentiles of Department Averages: 10th	25th	50th	75th	90th
US CS Public	93	$10,528	$13,473	$15,751	$17,350	$20,026
US CS Private	28	$9,953	$17,426	$20,223	$24,255	$28,210
US CE	9			$16,015		
US Information	9			$18,500		
Canadian	9			$17,000		

Research Assistantships

Department Type	# Depts	Percentiles of Department Averages: 10th	25th	50th	75th	90th
US CS Public	92	$12,000	$14,813	$16,401	$18,816	$21,313
US CS Private	33	$17,046	$18,133	$21,100	$25,095	$28,400
US CE	8			$16,737		
US Information	10	$10,241	$16,379	$18,834	$21,850	$22,450
Canadian	9			$17,000		

Full-Support Fellows

Department Type	# Depts	Percentiles of Department Averages: 10th	25th	50th	75th	90th
US CS Public	56	$13,974	$17,025	$20,251	$25,000	$30,000
US CS Private	24	$17,550	$20,355	$22,752	$28,396	$30,000
US CE	4			$25,000		
US Information	8			$23,300		
Canadian	3			$21,505		

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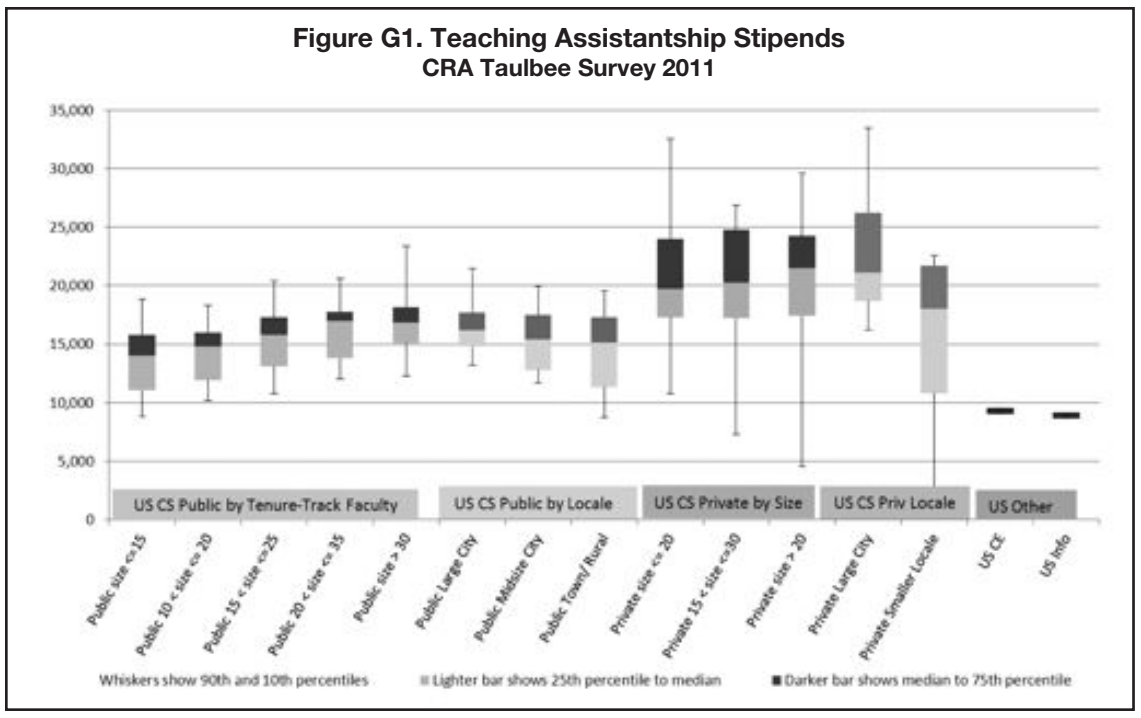

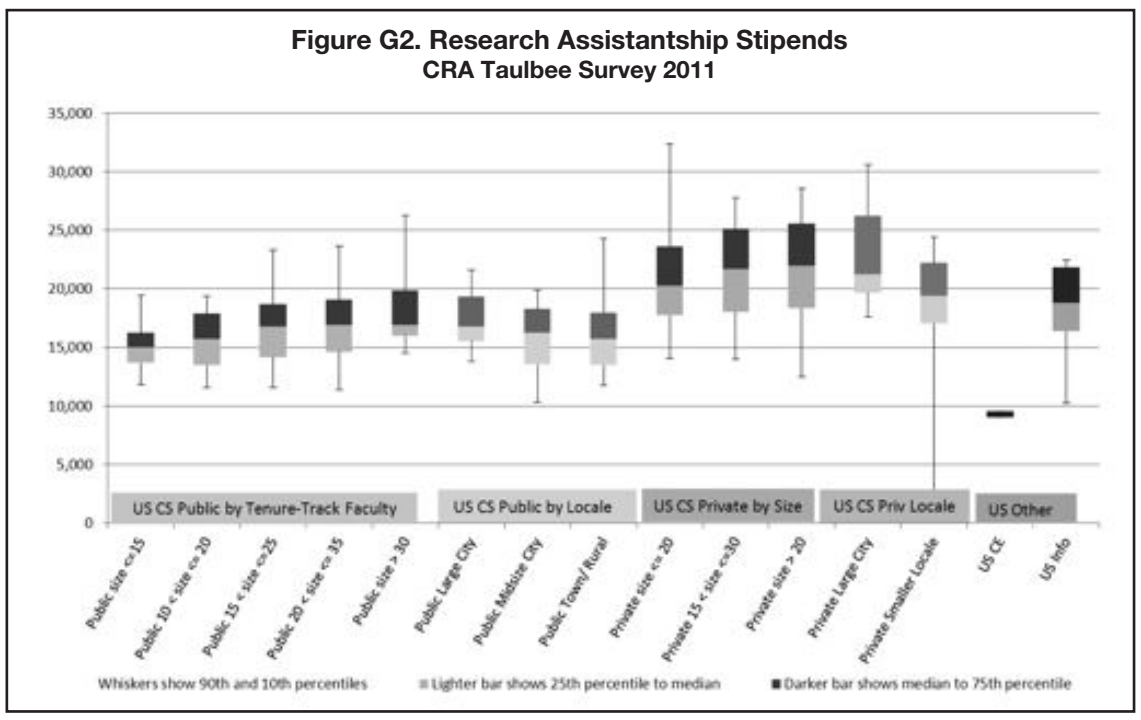

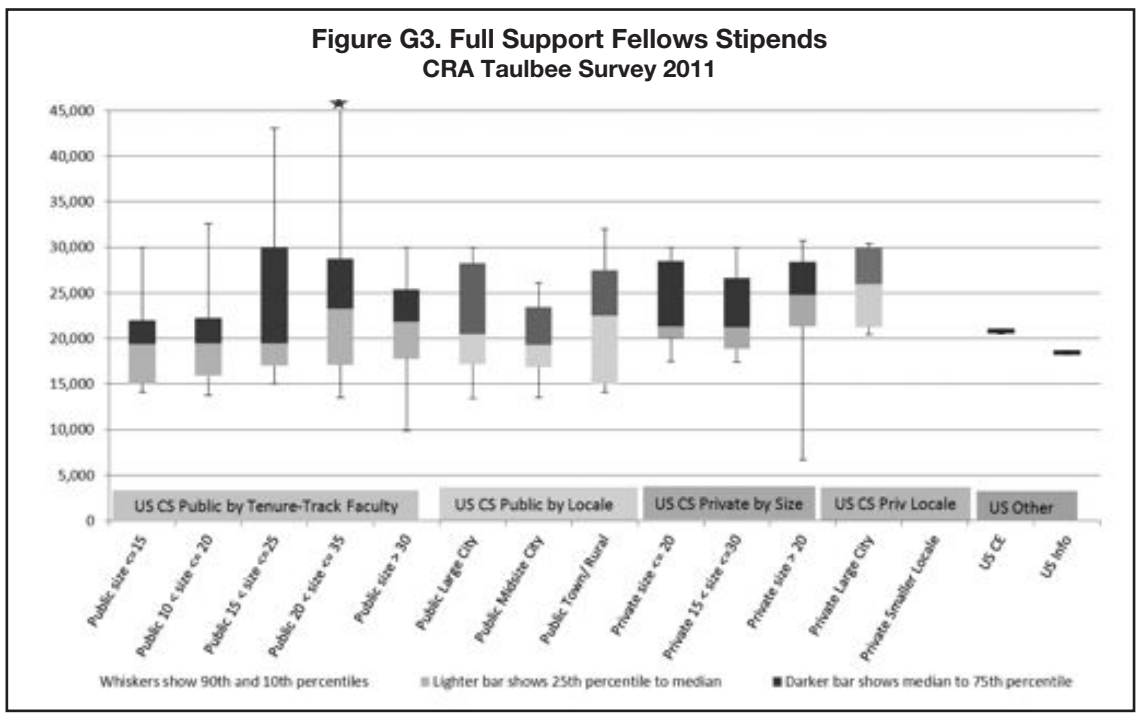

Faculty Salaries (Tables S1-S4; Figures S1-S9)

Each department was asked to report individual (but anonymous) faculty salaries if possible; otherwise, the department was requested to provide the minimum, median, mean, and maximum salaries for each rank (full, associate, and assistant professors and non-tenure-track teaching faculty including post-doctorates) and the number of persons at each rank. The salaries are those in effect on January 1, 2012. For U.S. departments, nine-month salaries are reported in U.S. dollars. For Canadian departments, twelve-month salaries are reported in Canadian dollars. Respondents were asked to include salary supplements such as salary monies from endowed positions.

U.S. CS data are reported via the box and whiskers diagrams. Data for CE, I, Canadian and new Ph.D.s are reported via tables. Additional salary tables (S5 to S15) for the U.S. CS departments are provided on pp. 22-24.

The tables and diagrams contain distributional data (first decile, quartiles, and ninth decile) computed from the department averages only. Thus, for example, a table row labeled "50" or the median line in a diagram is the median of the averages for the departments that reported within the stratum (the number of such departments reporting is shown in the "depts" row). It therefore is not a true median of all of the salaries. Those departments reporting individual salaries were provided more comprehensive distributional information based on individual salaries in January 2012. This year, 88 percent of those reporting salary data provided salaries at the individual level.

We also report salary data based on time in rank, for meaningful comparison of individual or departmental faculty salaries with national averages. We report associate professor salaries for time in rank of 7 years or less, and of more than 7 years. For full professors, we report time in rank of 7 years or less, 8 to 15 years, and more than 15 years.

Overall, the median of the reported U.S. CS average salaries increased between 1.3 and 6.6 percent, depending on tenure-track rank, and 3.3 percent for non-tenure-track teaching faculty. Full professor salaries had the widest variance, with 1.3 percent for full professors in rank 8-15 years and 6.6 percent for full professors in rank more than 15 years. Assistant professor salaries increased 2 percent and associate professor salary increases ranged from 2.4 to 3.3 percent. The median of average salaries in I departments increased 2 percent for assistant professors, 0 to 1 percent for associate professors, and 2 to 5 percent for full professors, depending on years in rank. For CE departments, assistant professor increases were 3.7 percent, associate professors in the 0 to 3 percent range, and full professors in the minus-2 to plus-2 percent range. Canadian salary

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changes were 3.7 percent for assistant professors, 1 to 9 percent for associate professors, and 4 to 11 percent for full professors. The median of average salaries for new Ph.D.s in tenure-track positions at U.S. departments (CS, CE and I combined) increased 4 percent. Because of the small number of departments reporting, comparative salary comments for CE, I and Canadian departments should be viewed with caution.

In all faculty categories, salaries in U.S. CS departments at private institutions tend to be higher than their counterparts at public institutions. Larger departments also tend to have higher salaries than do smaller departments, though for Associate Professors in rank more than 8 years the trend is less clear at both public and private institutions. For full professors at private institutions, the trend is less clear, and for postdocs there is little difference in either public or private institutions as a function of size.

Public universities in larger cities tend to have higher salaries for tenure-track faculty than do their counterparts in smaller locales, except for full professors in rank more than 15 years. It is difficult to make any statements about private universities relative to locale, since there are very few such departments not located in large cities that reported salary data.

Concluding Observations

Computing enrollments at all degree levels remain strong, and undergraduate enrollments continue to exhibit healthy increases. Within this context, the continued decline in the fraction of doctoral graduates who took tenure-track positions available at North American Ph.D.-granting departments, coupled with a significant increase in the fraction of such positions that went unfilled in U.S. CS departments, is worrisome. The somewhat improved U.S. economy appears to have made more industry positions available, putting further pressure on the ability to attract the best candidates. Hopefully the overall candidate pool is sufficiently qualified to meet the collective needs of the community, but these hiring data will bear watching.

Participating Departments

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,*

Table S1. Nine-month Salaries, 8 Responses of 31 US Computer Engineering Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	9	10	8	2	9	10	3	10	7	5	6
Indiv	42	30	16	9	30	36	8	34	23	20	14
10	$111,575			*	$87,082			$82,225			
25		$113,775		*		$93,031		$82,353			
50	$142,564	$132,902	$111,304	*	$93,948	$97,426	$101,028	$88,945	$81,170	$71,230	$45,816
75		$142,781		*		$108,090		$93,664			
90		$167,598		*		$121,024		$99,746			

Table S2. Nine-month Salaries, 13 Responses of 23 US Information Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	10	13	12	0	11	14	0	14	12	10	10
Indiv	23	46	50	0	42	76	0	86	82	43	36
10	$95,794	$106,740	$112,364		$76,498	$69,843		$72,241	$41,723	$35,974	$6,752
25	$117,330	$113,949	$122,944		$82,498	$85,078		$76,563	$60,639	$68,999	$40,749
50	$138,381	$141,355	$136,441		$101,355	$102,685		$89,279	$71,180	$86,463	$48,125
75	$180,858	$160,901	$142,724		$106,473	$107,445		$96,317	$85,065	$110,046	$55,083
90	$250,168	$166,344	$161,356		$126,364	$110,610		$99,562	$98,762	$126,344	$59,533

Table S3. Nine-month Salaries, 11 Responses of 30 Canadian Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	11	10	10	1	11	11	1	10	9	3	7
Indiv	57	53	60	2	61	133	1	52	36	5	64
10	$132,106	$130,776	$114,076	*	$111,197	$101,224	*	$84,993			
25	$148,464	$146,148	$136,334	*	$115,734	$109,625	*	$90,513			
50	$166,042	$153,362	$153,530	*	$127,752	$126,331	*	$101,217	$84,089	$50,439	$47,325
75	$191,274	$164,121	$165,715	*	$135,084	$133,559	*	$110,763			
90	$205,397	$178,105	$172,932	*	$149,046	$139,857	*	$114,313			

Table S4. Nine-month Salaries for New PhDs

	US (CS, CE, and Info Combined)				Canadian			
	Tenure-Track	Non-ten Teaching	Non-ten Research	Postdoc	Tenure-Track	Non-ten Teaching	Non-ten Research	Postdoc
Depts	43	12	10	40	2	0	0	4
Indiv	70	16	14	124	2	0	0	23
10	$80,274	$14,643	$4,000	$36,174	*			
25	$86,000	$51,250	$56,988	$42,215	*			
50	$90,000	$65,296	$68,050	$49,699	*			$48,905
75	$95,000	$71,500	$76,925	$59,427	*			
90	$97,960	$91,140	$94,625	$68,641	*			

See pp. 22-24 for additional salary tables (S5 - S15) covering U.S. CS departments.

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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.*

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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. In fall 2008, the first year these programs were surveyed as part of Taulbee, surveys were sent to CRA members, the CRA Deans group members, and participants in the iSchools Caucus (www.ischools.org) that met the criteria of granting Ph.D.s and being located in North America. Other I-programs who meet these criteria and would like to participate in the survey in future years are invited to contact survey@cra.org for inclusion.

[3]Classification of the population of an institution's locale is in accordance with the Carnegie Classification database. Large cities are those with population >= 250,000. Mid-size cities have population between 100,000 and 250,000. Town/rural populations are less than 100,000.

[4]Carla Brodley, Susanne Hambrusch, Jim Kurose, CRA Executive Director Andy Bernat and the authors comprised the Surveys Committee that made the recommendations for the new stratifications.

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

[6]All faculty tables: The survey makes no distinction between faculty specializing in CS vs. CE programs. Every effort is made to minimize the inclusion of faculty in electrical engineering who are not computer engineers.

Figure S1. US CS Department Average Salary, Full Professor in Rank 16+ years
CRA Taulbee Survey 2011

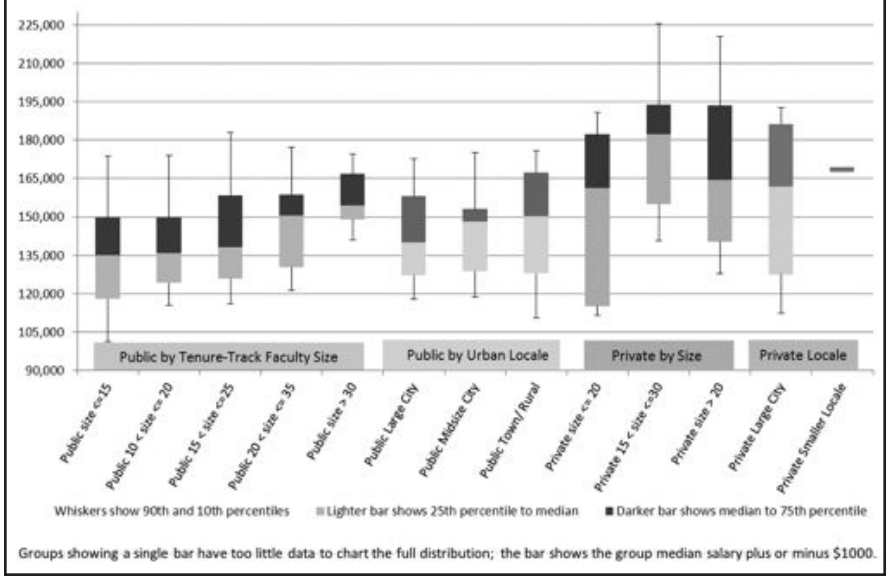


Figure S3. US CS Department Average Salary, Full Professor in Rank 0-7 years
CRA Taulbee Survey 2011

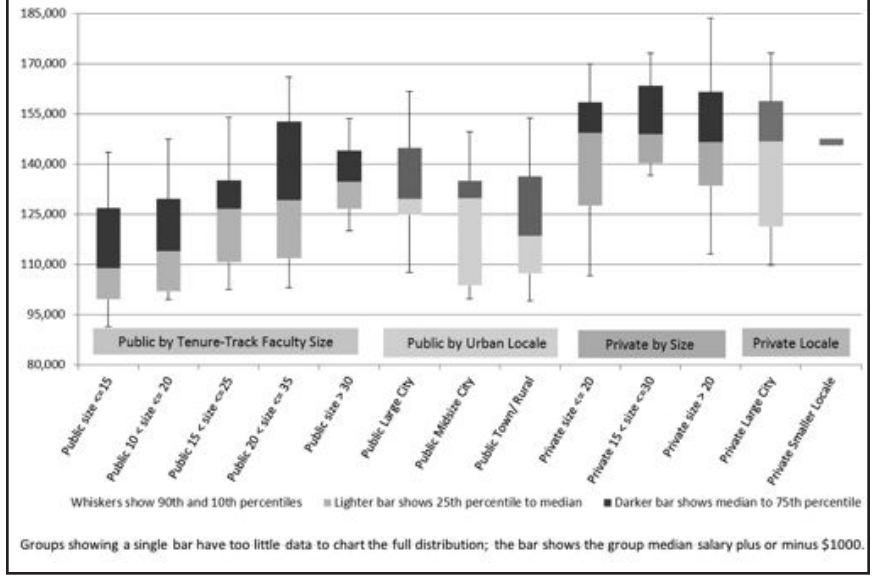


Figure S2. US CS Department Average Salary, Full Professor in Rank 8-15 years
CRA Taulbee Survey 2011

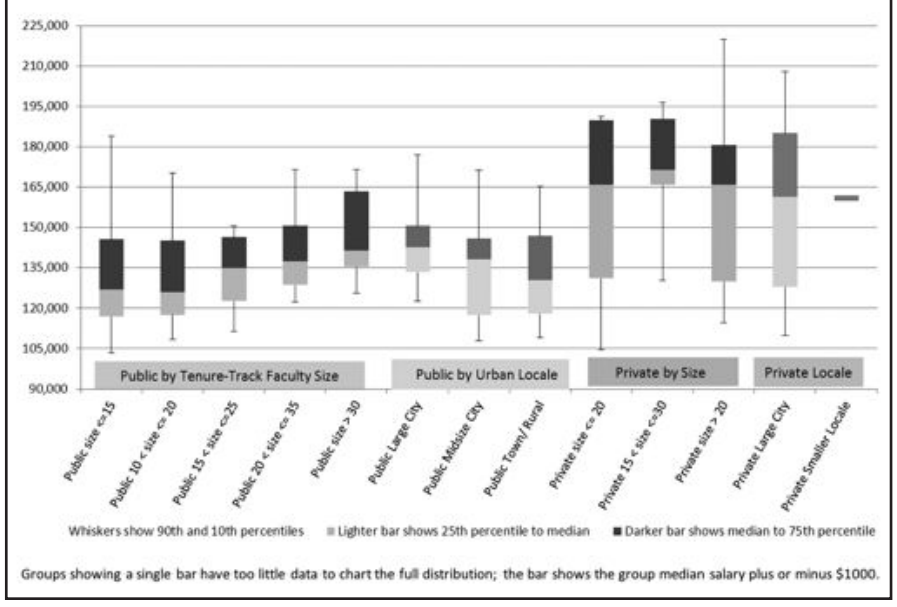
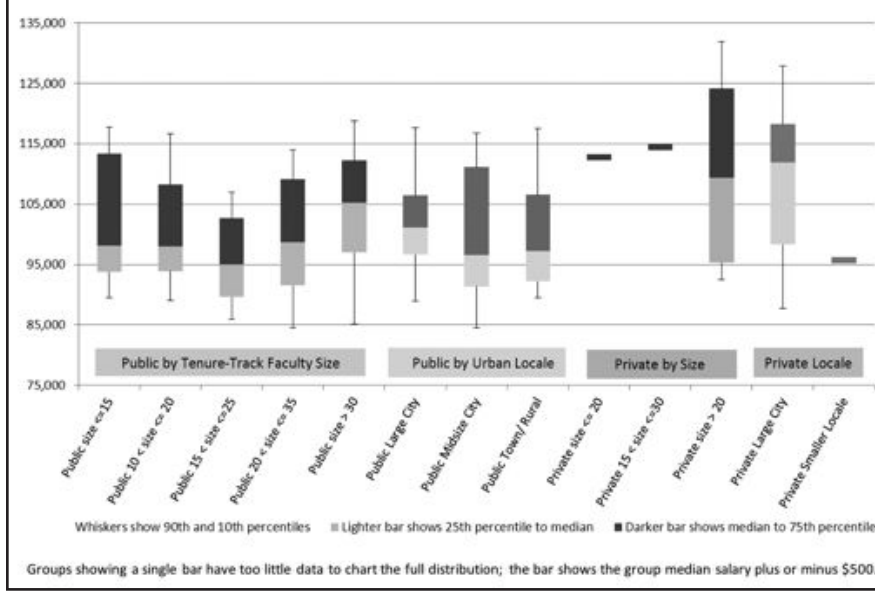


Figure S4. Associate Professors in Rank 8+ Years



2010-2011 Taulbee Survey

Figure S5. US CS Department Average Salary, Associate Professor in Rank 0-7 years
CRA Taulbee Survey 2011

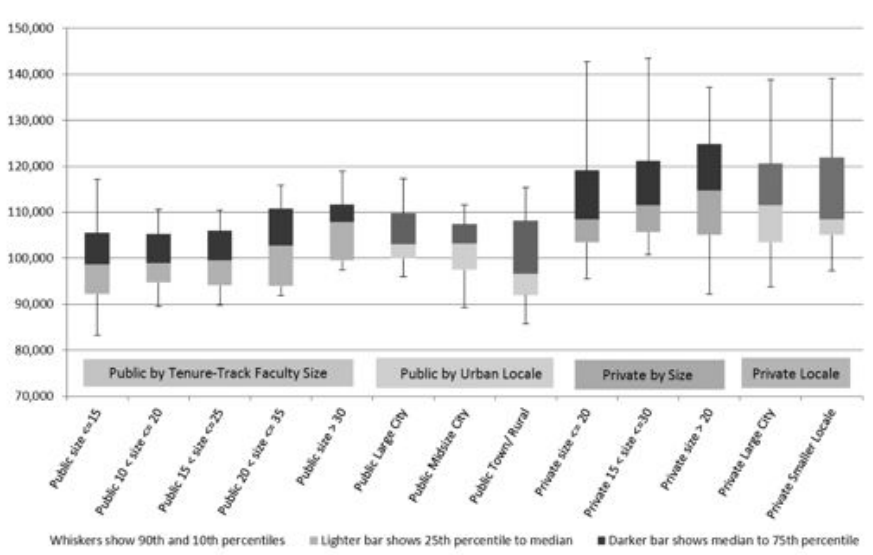
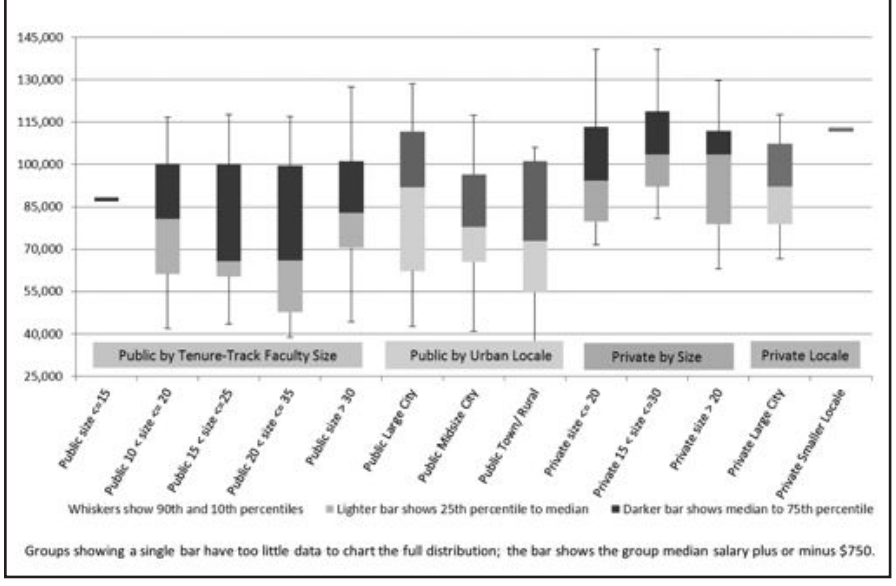


Figure S8. US CS Department Average Salary, Non-Tenure Track Research Facility
CRA Taulbee Survey 2011



Groups showing a single bar have too little data to chart the full distribution; the bar shows the group median salary plus or minus $750.

Figure S6. Assistant Professors

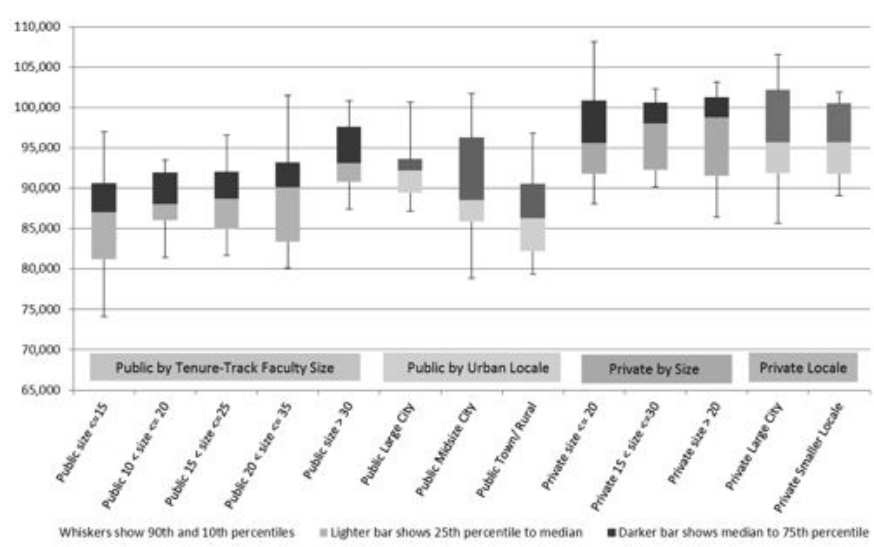
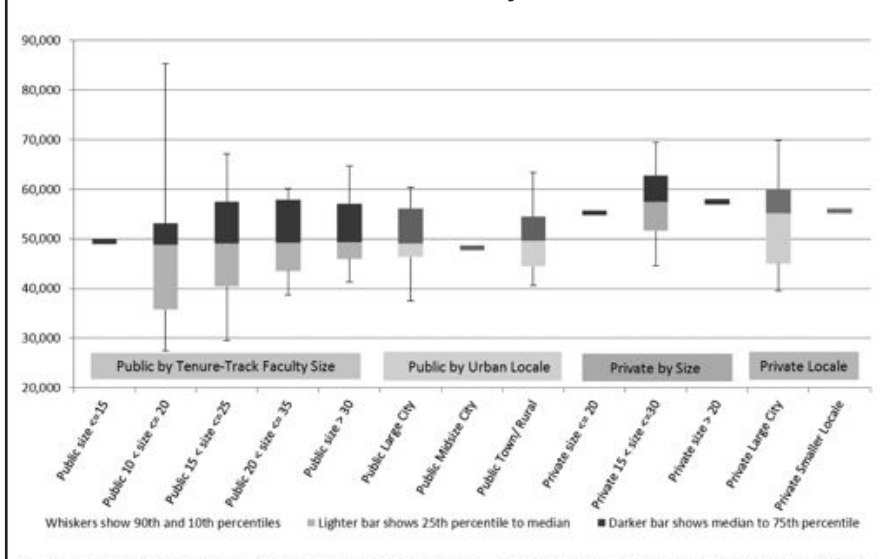
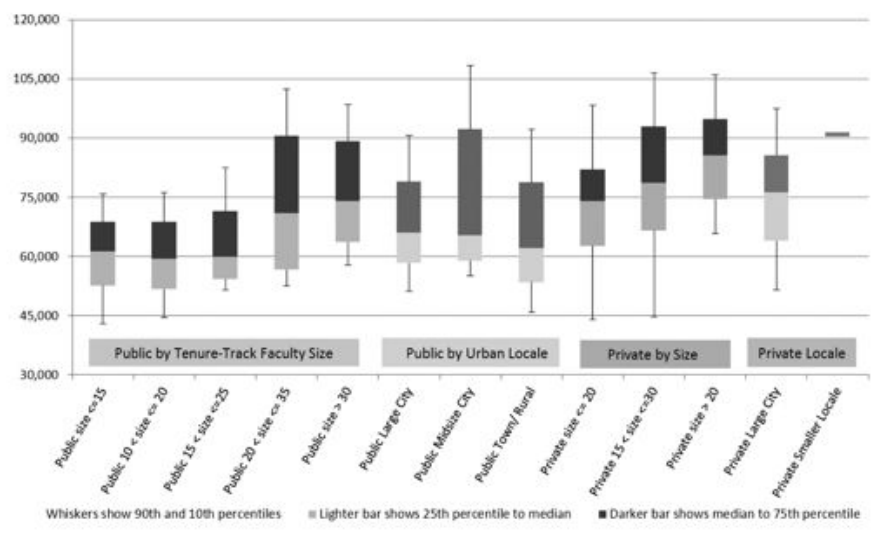


Figure S9. US CS Department Average Salary, Postdoctorates
CRA Taulbee Survey 2011



Groups showing a single bar have too little data to chart the full distribution; the bar shows the group median salary plus or minus $500.

Figure S7. US CS Department Average Salary, Non-Tenure Track Teaching Facility
CRA Taulbee Survey 2011



Groups showing a single bar have too little data to chart the full distribution; the bar shows the group median salary plus or minus $1000.

THE CRA SURVEYS COMMITTEE WANTS TO HEAR FROM YOU!

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EMAIL YOUR COMMENTS TO:

zweben@cse.ohio-state.edu; bizot@cra.org

Table S5. Nine-month Salaries, 137 Responses of 184 US CS Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	106	114	112	8	98	123	10	126	113	67	71
Indiv	505	517	548	58	305	828	79	626	473	379	460
10	117,072	115,636	102,415		87,097	91,945	94,557	81,956	51,596	47,766	39,981
25	129,385	126,338	114,356		93,915	97,391	97,994	87,131	58,337	68,019	45,050
50	149,576	140,096	131,337	142,907	100,241	104,999	104,289	91,793	68,713	86,865	49,975
75	166,752	161,762	146,736		111,284	111,082	119,662	95,709	81,053	102,315	57,475
90	183,279	177,714	160,674		118,262	119,551	159,143	101,029	96,895	118,755	61,651

Table S6. Nine-month Salaries, 102 Responses of 133 US CS Public (All Public), Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	80	89	84	7	79	93	8	94	84	46	53
Indiv	349	376	403	54	234	578	69	465	334	255	260
10	$117,553	$115,471	$100,254		$87,143	$90,212		$81,113	$51,361	$41,974	$38,635
25	$128,294	$124,853	$111,525		$92,422	$95,494		$85,937	$56,439	$61,274	$44,625
50	$146,267	$138,124	$127,642	$145,650	$98,134	$102,280	$104,289	$89,978	$64,624	$80,666	$49,041
75	$158,543	$149,308	$140,699		$109,023	$108,981		$93,306	$79,050	$100,264	$54,504
90	$173,997	$170,364	$153,424	.	$116,907	$115,137	.	$99,658	$96,405	$116,820	$60,546

Table S7. Nine-month Salaries, 35 Responses of 51 US CS Private (All Private), Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	26	25	28	1	19	30	2	32	29	21	18
Indiv	156	141	145	4	71	250	10	161	139	124	200
10	$114,467	$115,132	$110,692	*	$86,689	$96,825	*	$88,498	$55,050	$70,234	$41,772
25	$139,295	$130,466	$131,611	*	$95,665	$103,565	*	$91,768	$66,857	$79,500	$47,439
50	$163,611	$165,674	$146,564	*	$111,078	$110,461	*	$95,694	$77,425	$94,225	$55,455
75	$188,736	$181,824	$158,555	*	$118,796	$120,997	*	$100,838	$90,533	$111,620	$61,194
90	$200,218	$194,790	$173,036	*	$125,900	$138,759	*	$103,306	$105,850	$129,802	$66,374

Table S8. Nine-month Salaries, 28 Responses of US CS Public With <=15 Tenure-Track Faculty, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	17	20	18	1	21	22	3	21	19	4	5
Indiv	38	39	32	4	55	67	13	66	51	7	7
10	$101,293	$103,480	$91,358	*	$89,514	$83,196		$74,100	$43,000		
25	$117,949	$116,815	$99,570	*	$93,711	$92,139		$81,214	$52,653		
50	$134,991	$126,961	$108,827	*	$98,134	$98,702	$112,329	$87,024	$61,256	$87,650	$49,500
75	$149,732	$145,534	$126,650	*	$113,329	$105,506		$90,633	$68,713		
90	$173,706	$184,026	$143,480	*	$117,777	$117,178		$97,029	$75,867		

Table S9. Nine-month Salaries, 36 Responses of US CS Public With 10 < Tenure-Track Faculty <=20, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	29	32	27	1	30	33	3	33	27	9	10
Indiv	76	69	64	5	78	135	17	113	75	16	22
10	$115,531	$108,313	$99,495	*	$89,103	$89,599		$81,458	$44,550		$27,525
25	$124,230	$117,469	$101,801	*	$93,915	$94,643		$86,024	$51,739		$35,805
50	$135,811	$125,925	$114,000	*	$98,017	$98,897	$97,169	$88,000	$59,442	$80,301	$48,838
75	$149,732	$145,055	$129,506	*	$108,277	$105,191		$91,917	$68,713		$53,138
90	$174,038	$170,387	$147,472	*	$116,631	$110,641		$93,465	$76,174		$85,338

Table S10. Nine-month Salaries, 34 Responses of US CS Public With 15 < Tenure-Track Faculty <=25, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	29	32	31	2	27	32	2	33	29	15	17
Indiv	88	96	100	16	74	168	18	126	101	72	47
10	$115,993	$111,343	$102,549	*	$85,879	$89,845	*	$81,654	$51,500	$43,459	$29,450
25	$125,934	$122,618	$110,649	*	$89,623	$94,033	*	$84,925	$54,260	$60,378	$40,382
50	$138,117	$134,838	$126,536	*	$94,948	$99,518	*	$88,722	$60,000	$65,700	$49,041
75	$158,446	$146,317	$135,039	*	$102,700	$105,919	*	$92,047	$71,492	$100,000	$57,455
90	$182,907	$150,491	$153,935	*	$106,941	$110,512	*	$96,562	$82,431	$117,667	$67,114

Table S11. Nine-month Salaries, 31 Responses of US CS Public With 20 < Tenure-Track Faculty <=35, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	27	29	27	2	26	30	1	31	27	18	22
Indiv	121	124	135	15	86	186	9	148	119	102	93
10	$121,302	$122,306	$103,004	*	$84,456	$91,899	*	$80,095	$52,544	$38,849	$38,668
25	$130,418	$128,574	$111,838	*	$91,533	$93,928	*	$83,389	$56,617	$47,708	$43,573
50	$150,563	$137,425	$129,014	*	$98,612	$102,796	*	$90,123	$71,015	$65,895	$49,211
75	$158,731	$150,511	$152,572	*	$109,178	$110,837	*	$93,211	$90,590	$99,586	$57,951
90	$177,200	$171,633	$165,933	*	$113,951	$115,916	*	$101,476	$102,471	$116,909	$60,147

Table S12. Nine-month Salaries, 29 Responses of US CS Public With Tenure-Track Faculty >30, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	25	27	27	4	22	28	3	29	27	21	23
Indiv	182	196	210	34	75	266	38	215	146	150	174
10	$140,956	$125,626	$120,011		$85,124	$97,424		$87,388	$57,791	$44,377	$41,286
25	$149,092	$135,300	$126,521		$96,967	$99,450		$90,740	$63,664	$70,412	$46,000
50	$154,632	$141,355	$134,655	$142,907	$105,224	$107,913	$103,636	$93,056	$74,043	$82,874	$49,381
75	$166,757	$163,325	$143,948		$112,237	$111,619		$97,570	$89,256	$101,160	$57,116
90	$174,658	$171,530	$153,637		$118,826	$118,960		$100,788	$98,481	$127,447	$64,657

Table S13. Nine-month Salaries, 19 Responses of US CS Private With <=20 Tenure-Track Faculty, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	11	11	13	1	9	16	2	18	15	10	9
Indiv	37	57	38	4	16	70	10	62	53	60	34
10	$111,619	$104,567	$106,653	*		$95,598	*	$88,080	$44,019	$71,575	
25	$115,276	$131,040	$127,602	*		$103,448	*	$91,771	$62,668	$79,750	
50	$161,272	$165,667	$149,250	*	$112,747	$108,409	*	$95,594	$74,000	$94,203	$55,243
75	$182,250	$189,771	$158,364	*		$119,103	*	$100,850	$82,046	$113,250	
90	$190,791	$191,201	$169,862	*		$142,775	*	$108,143	$98,395	$140,779	

Table S14. Nine-month Salaries, 17 Responses of US CS Private With 15 < Tenure-Track Faculty <=30, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	13	13	13	0	7	15	0	16	14	11	13
Indiv	65	70	53	0	15	80	0	65	47	59	91
10	$140,623	$130,320	$136,547		*	$100,749		$90,142	$44,643	$80,774	$44,571
25	$155,070	$165,670	$140,235		*	$105,604		$92,222	$66,643	$92,184	$51,625
50	$182,250	$171,255	$148,769		$114,357	$111,542		$98,025	$78,695	$103,635	$57,475
75	$194,014	$190,288	$163,250		*	$121,096		$100,575	$92,947	$118,649	$62,781
90	$225,408	$196,535	$173,073		*	$143,450		$102,318	$106,528	$140,716	$69,500

Table S15. Nine-month Salaries, 15 Responses of US CS Private With Tenure-Track Faculty >20, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	Years not given	In rank 8+ years	In rank 0-7 years	Years not given		Teach	Research	Postdoc
Depts	15	14	15	0	10	14	0	14	14	11	9
Indiv	119	84	107	0	55	180	0	99	86	64	166
10	$127,910	$114,711	$113,132		$92,533	$92,246		$86,449	$65,866	$63,088	
25	$140,381	$129,879	$133,496		$95,351	$105,098		$91,495	$74,561	$78,800	
50	$164,583	$165,789	$146,482		$109,318	$114,761		$98,723	$85,635	$103,635	$57,475
75	$193,512	$180,519	$161,500		$124,111	$124,766		$101,288	$94,785	$111,789	
90	$220,622	$220,013	$183,570		$131,961	$137,265		$103,166	$106,038	$129,802	