

2015 Taulbee Survey

Continued Booming Undergraduate CS Enrollment; Doctoral Degree Production Dips Slightly

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This article and the accompanying figures and tables present the results from the 45th annual CRA Taulbee Survey¹. The survey, conducted annually by the Computing Research Association, documents 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 year’s survey also includes the so-called “department profiles” data about space, research funding sources, and teaching loads; these data are only requested every three years.

CRA gathers survey data during the fall. Responses received by February 5, 2016 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 (2014-15). Data for new students in all categories refer to the current academic year (2015-16). Projected student production and information on faculty salaries are also for the current academic year; salaries are those effective January 1, 2016.

We surveyed a total of 266 Ph.D.-granting departments; we received responses from 178 for a response rate of 67 percent. This is similar to last year’s 68 percent. The response rates from CE and Canadian departments continue to be rather low, and this year the CE response rate was even lower than usual. U.S. CS, U.S. I, and Canadian response rates were similar to 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 shown in Figure 1 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 is 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 December 2015; these results included additional distributional information not contained in this report. The CRA Board views this as a benefit of participating in the survey.

Degree, enrollment and faculty salary data for the U.S CS departments 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 is stratified according to the population of the locale in which the institution is located.³ These stratifications allow our readers to see multiple views of important data, and hopefully gain new insights from them. 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.

We thank all respondents to this year’s questionnaire. Departments that participated are listed at the end of this article. CRA member respondents again will be given the opportunity to obtain certain survey information for a self-selected peer group. Instructions for doing this will be emailed to all such departments.

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%)
2012	152/189 (80%)	11/32 (34%)	14/30 (47%)	16/26 (62%)	193/277 (70%)
2013	144/188 (77%)	10/30 (33%)	14/26 (54%)	11/22 (50%)	179/266 (67%)
2014	143/188 (76%)	13/31 (42%)	12/26 (46%)	13/19 (68%)	181/268 (68%)
2015	146/190 (77%)	8/32 (25%)	12/26 (46%)	12/18 (67%)	178/266 (67%)

Doctoral Degree Production, Enrollments and Employment

(Tables DI-D10; Figures DI-D6)

Last year's respondents reported production of 1,940 doctoral degrees. This year's respondents produced 1,780 doctoral degrees, a decline of 8.2 percent. However, on a per-department basis, the decline is only 4.9 percent. An examination of the data by area of computing shows that the aggregate decline in degrees produced does not come from U.S. CS departments, and that overall, U.S. private CS departments actually increased their productivity on a per-department basis. Each of the other groups (CE, I and Canadian) show declines, but these numbers are more strongly influenced by the specific departments responding in a given year, since we receive data from only a small number of these departments.

Among all departments reporting both this year and last year, the number of total doctoral degrees declined by 3.5 percent,

but among U.S. CS departments reporting both years, there was essentially no change (actually an increase of 0.3 percent).

Women comprised 18.3 percent of CS doctoral graduates and 20.2 percent of all doctoral computing graduates, both values being slightly higher than those reported last year. The percentage of CS doctoral degrees that went to Non-resident Aliens also was slightly higher than last year, at 60.7 percent compared with 60.1 percent, while the percentage that went to resident Asians dropped to 6.4 percent from 8.1 percent. CE had an even higher percentage of Non-resident Aliens than did CS, and was less gender diverse. Among I doctoral degrees, 45.8 percent went to Non-resident Aliens and 33.8 percent to Whites; for Non-resident Aliens this is an increase compared with last year's report; for Whites it is a slight decrease.

The percentage of doctoral graduates who were American Indian or Alaska Native, Black or African American, Native Hawaiian/Pacific Islander, Hispanic, or Multiracial Non-Hispanic rose from 2.6 percent to 4.0 percent in CS, and was 4.5 percent in aggregate across CS, CE and I (vs 3.4 percent in 2013-14). As

they did last year, Non-resident Aliens and Resident Asians comprised a higher percentage of the CS female doctoral graduates than they did CS male graduates, while Whites comprised a lower percentage of the female graduates as compared with male graduates (Table D9).

Among currently enrolled CS doctoral students whose ethnicity is known, we see the same direction of difference among

Non-resident Aliens and Whites; Non-resident Aliens comprise a higher percent of the enrolled women than they do the enrolled men, and Whites comprise a lower percentage of enrolled women. This is similar to the observations last year. Resident Asians comprise a similar percentage of enrolled Asian men and Asian women (Table D10).

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	97	1,179	12.2	1,296	13.4	1,326	15.1	949	78	12.2
US CS Private	33	391	11.5	502	15.2	403	12.2	227	24	9.5
US CS Total	130	1,570	12.0	1,798	13.8	1,729	14.3	1,176	102	11.5
US CE	4	33	6.6	40	10.0	65	16.3	63	3	21.0
US Info	12	82	6.8	107	8.9	101	9.2	82	9	9.1
Canadian	12	95	9.5	176	14.7	128	11.6	113	8	14.1
Grand Total	158	1,780	11.3	2,121	13.4	2,023	13.8	1,434	122	11.8

Table D2. PhDs Awarded by Gender

	CS		CE		I		Total	
Male	1,263	81.7%	75	85.2%	82	56.6%	1,420	79.8%
Female	283	18.3%	13	14.8%	63	43.4%	359	20.2%
Total Known Gender	1,546		88		145		1,779	
Gender Unknown	1		0		0		1	
Grand Total	1,547		88		145		1,780	-

Table D3. PhDs Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	875	60.7%	58	67.4%	65	45.8%	998	59.8%
Amer Indian or Alaska Native	2	0.1%	0	0.0%	0	0.0%	2	0.1%
Asian	92	6.4%	4	4.7%	14	9.9%	110	6.6%
Black or African-American	15	1.0%	0	0.0%	10	7.0%	25	1.5%
Native Hawaiian/Pac Islander	6	0.4%	0	0.0%	0	0.0%	6	0.4%
White	416	28.8%	23	26.7%	48	33.8%	487	29.2%
Multiracial, not Hispanic	11	0.8%	0	0.0%	1	0.7%	12	0.7%
Hispanic, any race	25	1.7%	1	1.2%	4	2.8%	30	1.8%
Total Residency & Ethnicity Known	1,442		86		142		1,670	
Resident, ethnicity unknown	50		0		1		51	
Residency unknown	55		2		2		59	
Grand Total	1,547		88		145		1,780	-

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: 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	10	0	7	6	6	4	12	5	8	12	2	8	4	9	3	0	5	14	8	17	140	10.0%
Researcher	2	0	1	2	0	1	5	2	1	2	0	2	1	2	2	1	0	0	1	1	26	1.8%
Postdoc	22	0	10	13	7	3	6	12	5	4	2	4	1	11	9	3	1	2	9	13	137	9.7%
Teaching Faculty	6	0	5	2	1	2	2	0	5	1	3	8	2	3	2	2	4	3	2	11	64	4.6%
North American, Other Academic																						
Other CS/CE/I Dept.	2	0	2	1	0	0	2	0	2	4	0	3	2	3	0	1	1	2	3	5	33	2.3%
Non-CS/CE/I Dept	0	0	0	0	0	0	1	1	0	2	0	0	0	0	1	1	0	0	1	1	8	0.6%
North American, Non-Academic																						
Industry	77	2	67	47	46	21	23	35	34	11	6	57	31	31	48	9	29	111	35	86	806	57.3%
Government	4	0	1	1	3	6	1	3	6	0	3	0	0	3	3	3	1	3	2	4	47	3.3%
Self-Employed	1	0	0	2	1	0	0	2	1	0	1	0	1	1	1	0	2	5	0	4	22	1.6%
Unemployed	1	0	2	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	7	0.5%
Other	0	0	0	1	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	2	7	0.5%
Total Inside North America																						
	125	2	95	75	64	37	53	61	62	37	17	84	42	63	71	20	43	140	62	144	1,297	92.2%
Outside North America																						
Ten-Track in PhD	2	0	2	0	0	0	0	2	2	3	0	1	0	0	1	0	1	1	1	3	19	1.4%
Researcher in PhD	1	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0	0	0	2	1	9	0.6%
Postdoc in PhD	1	0	1	0	0	0	0	4	0	1	0	1	0	1	4	1	1	0	5	2	22	1.6%
Teaching in PhD	0	0	0	0	1	0	0	1	0	1	1	2	0	0	1	0	0	0	0	0	7	0.5%
Other Academic	1	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	2	1	0	8	0.6%
Industry	3	0	2	3	1	0	1	0	0	1	0	2	0	2	3	0	1	3	3	1	26	1.8%
Government	0	0	4	0	0	0	0	0	0	1	0	0	0	0	3	0	0	1	1	0	10	0.7%
Self-Employed	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0.3%
Unemployed	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.1%
Other	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0.2%
Total Outside NA	9	0	11	3	2	1	3	8	2	7	2	7	0	8	13	1	3	8	13	8	109	7.8%
Total with Employment Data, Inside North America plus Outside North America																						
	134	2	106	78	66	38	56	69	64	44	19	91	42	71	84	21	46	148	75	152	1,406	
Employment Type & Location Unknown																						
	19	5	13	20	9	7	12	13	12	3	11	11	3	3	8	4	2	19	5	195	374	
Grand Total	153	7	119	98	75	45	68	82	76	47	30	102	45	74	92	25	48	167	80	347	1,780	

Among those pursuing I degrees, 62 percent of the men and 55 percent of the women are Non-resident Aliens or Resident Asians. This is a higher percentage for both men and women than last year, but is a similar-sized difference between men and women. Also similar to last year, there is no appreciable difference in the percentage of men vs the percentage of women among Whites pursuing I degrees.

At U.S. CS departments, the average number of students per department who passed qualifier exams rose to 14.3 in 2014-15, from 13.9 in 2013-14. The increase was due to departments

in public institutions; there was a decrease in U.S. private institutions. The average number per department who passed thesis candidacy exams in 2014-15 (most, but not all, departments have such exams) increased slightly from 2013-14 at both public and private U.S. CS departments (Table D1).

Once again, the number of new Ph.D. students per department reporting increased slightly this year compared with the total from last year's reporting departments (Tables I and D5). This reflects increases in CS departments and decreases in CE, I, and Canadian departments. Among all departments that

Table D4a. Detail of Industry Employment

	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	Unknown	Other	Total	
Inside North America																							
Research	47	0	46	25	27	12	14	18	13	4	2	33	19	15	27	4	20	40	15	12	24	417	51.7%
Non-Research	16	1	14	15	18	6	9	12	16	7	4	19	11	13	15	4	7	58	14	7	26	292	36.2%
Postdoctorate	3	0	1	1	0	1	0	0	1	0	0	1	0	0	1	0	2	2	2	2	0	17	2.1%
Type Not Specified	11	1	6	6	1	2	0	5	4	0	0	4	1	3	5	1	0	11	4	8	7	80	9.9%
Total Inside NA	77	2	67	47	46	21	23	35	34	11	6	57	31	31	48	9	29	111	35	29	57	806	
Outside North America																							
Research	3	0	1	2	1	0	0	0	0	1	0	1	0	1	1	0	1	1	1	0	1	15	57.7%
Non-Research	0	0	1	1	0	0	1	0	0	0	0	1	0	1	0	0	0	2	1	0	0	8	30.8%
Postdoctorate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	7.7%
Type Not Specified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3.8%
Total Outside NA	3	0	2	3	1	0	1	0	0	1	0	2	0	2	3	0	1	3	3	0	1	26	

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	1,563	140	1,703	18.1	78	13	91	5.7	68	4	72	10.3	1,866	19.6
US CS Private	564	13	577	16.0	18	0	18	4.5	14	0	14	7.0	609	16.9
US CS Total	2,127	153	2,280	17.5	96	13	109	5.5	82	4	86	9.6	2,475	18.9
US CE	0	0	0	0.0	37	7	44	8.8	0	0	0	0.0	44	8.8
US Information	7	0	7	7.0	0	0	0	0.0	90	7	97	8.1	104	8.7
Canadian	116	13	129	10.8	0	0	0	0.0	0	0	0	0.0	129	10.8
Grand Total	2,250	166	2,416	16.9	133	20	153	6.1	172	11	183	8.7	2,752	17.2

reported both years, the number of new Ph.D. students was unchanged. If only U.S. CS departments that reported both years are considered, there was an increase of 2.0 percent.

The proportion of new doctoral students from outside North America continues to increase. This year's proportion is 65.7 percent while last year's was 62.6 percent. There were increases in all categories of departments with the exception of U.S. CS private (Table D5a).

Among programs that reported both years, total doctoral enrollment increased 1.1 percent. If only U.S. computer science departments are considered, the increase was only 0.2 percent (Table I). Total doctoral enrollment by gender is in about the same overall proportion reported last year (Table D7), with a slight increase in diversity in CS and a decrease in I departments. The fraction of doctoral students who are not either Non-resident Aliens,

Asian or White remains below 5 percent (Table D8).

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 two years 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. The graph suggests that doctoral production will remain fairly steady during the next few years, though the departments are forecasting an increase in production during 2015-16 (Table D1).

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. The percentage of new Ph.D.s who took positions in North American industry was 57.3 percent, just below last year's historic record of 57.5 percent. Among those doctoral graduates who went to North American industry as other than a postdoc and for whom the type of industry position was known, about 59 percent took research positions (Table D4a). This is up from the 56 percent reported last year. This year, definitive data was provided for 90 percent of the graduates who went to industry, an improvement over last year's 87 percent.

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	1,173	75	35	1,283	1,866	68.8%
US CS Private	317	16	9	342	609	56.2%
Total US CS	1,490	91	44	1,625	2,475	65.7%
US CE	0	36	0	36	44	81.8%
US Info	6	0	54	60	104	57.7%
Canadian	87	0	0	87	129	67.4%
Grand Total	1,583	127	98	1,808	2,752	65.7%

Table D6. PhD Enrollment by Department Type

Department Type	# Depts	CS		CE		I		Total	
		#	%	#	%	#	%	#	%
US CS Public	100	8,880	66.2%	566	66.2%	487	66.2%	9,933	64.5%
US CS Private	37	2,903	24.2%	71	24.2%	156	24.2%	3,130	20.3%
Total US CS	137	11,783	90.3%	637	90.3%	643	90.3%	13,063	84.8%
US CE	6	45	0.1%	480	0.1%	0	0.1%	525	3.4%
US Info	12	29	0.2%	0	0.2%	605	0.2%	634	4.1%
Canadian	11	862	9.3%	0	9.3%	313	9.3%	1,175	7.6%
Grand Total	166	12,719		1,117		1,561		15,397	

Table D7. PhD Enrollment by Gender

	CS		CE		I		Total	
	#	%	#	%	#	%	#	%
Male	10,062	81.0%	943	84.4%	1,044	66.9%	12,049	79.8%
Female	2,361	19.0%	174	15.6%	517	33.1%	3,052	20.2%
Total Known Gender	12,423		1,117		1,561		15,101	
Gender Unknown	296		0		0		296	
Grand Total	12,719		1,117		1,561		15,397	

Table D8. PhD Enrollment by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	7,067	61.0%	715	65.6%	649	51.7%	8,431	60.5%
Amer Indian or Alaska Native	39	0.3%	6	0.6%	2	0.2%	47	0.3%
Asian	916	7.9%	76	7.0%	96	7.6%	1,088	7.8%
Black or African-American	150	1.3%	18	1.7%	48	3.8%	216	1.5%
Native Hawaiian/ Pac Islander	7	0.1%	1	0.1%	7	0.6%	15	0.1%
White	3,142	27.1%	237	21.7%	413	32.9%	3,792	27.2%
Multiracial, not Hispanic	69	0.6%	11	1.0%	13	1.0%	93	0.7%
Hispanic, any race	204	1.8%	26	2.4%	28	2.2%	258	1.9%
Total Known	11,594		1,090		1,256		13,940	
Resident, ethnicity unknown	588		10		251		849	
Residency unknown	537		17		54		608	
Grand Total	12,719		1,117		1,561		15,397	

Table D9. PhDs Awarded by Gender and Ethnicity, From 175 Departments

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	707	168	0	60	64	51	7	0	69	58	33	32	0	41	53	998	59.8
Amer Indian or Alaska Native	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1
Asian	66	26	0	6	10	3	1	0	4	8	8	6	0	10	10	110	6.6
Black or African-American	10	5	0	1	2	0	0	0	0	0	6	4	0	7	7	25	1.5
Native Hawaiian/ Pac Islander	4	2	0	0	1	0	0	0	0	0	0	0	0	0	0	6	0.4
White	356	60	0	30	23	19	4	0	26	33	31	17	0	38	28	487	29.2
Multiracial, not Hispanic	9	2	0	1	1	0	0	0	0	0	1	0	0	1	0	12	0.7
Hispanic, any race	25	0	0	2	0	1	0	0	1	0	2	2	0	3	3	30	1.8
Total Res & Ethnicity Known	1,179	263	0	0	0	74	12	0			81	61	0			1,670	
Resident, ethnicity unknown	36	14	0			0	0	0			0	1	0			51	
Not Reported (N/R)	48	6	1			1	1	0			1	1	0			59	
Gender Totals	1,263	283	1			75	13	0			82	63	0			1,780	
%	81.7%	18.3%				85.2%	14.8%				56.6%	43.4%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

The percentage of 2014-15 graduates who took North American academic jobs rose this year to 29.0 from last year's all-time low of 27.3. The percentage of graduates taking tenure-track positions in North American doctoral granting computing departments rose to 10.0 in 2014-15, from 7.6 for 2013-14 graduates. The percentage taking positions in North American non-Ph.D.-granting computing departments rose from 1.9 percent to 2.3 percent, while the percentage taking North American academic postdoctoral positions dropped from 11.6 percent to 9.7 percent.

Among those whose employment is known, the proportion of Ph.D. graduates who were reported taking positions outside of North America fell from 9.4 percent to 7.8 percent. Only 24 percent of those employed outside of North America went to industry compared to 37 percent reported last year. About 17 percent went to tenure-track academic positions, down from 26 percent last year, while approximately 20 percent went to academic postdoctoral positions, similar to last year. Teaching and research positions in academic departments, and employment in government positions, were higher this year

among those who went outside North America. Of the doctoral graduates who went to non-North American industry positions, the positions were in research by almost a two-to-one margin over those that were not research; that ratio was three-to-one each of the past two years. Definitive data was provided for 96 percent of these graduates.

Employment in industry postdoctoral positions is included in the overall industry numbers. When academic and industry postdocs are combined, the result is that 12.6 percent of 2014-15 doctoral graduates took some type of postdoctoral position, down from 15.6 percent last year and 18.1 percent the year before last. Approximately 11 percent of these were industry postdocs; last year 14 percent of postdocs were industry postdocs.

The unemployment rate for new Ph.D.s again this year was below one percent. In 2014-15, 21.0 percent of new Ph.D.s' employment status was unknown; in 2013-14 it was 19.7 percent. It is possible that the lack of information about the employment of more than one in five graduates skews the real overall percentages for certain employment categories.

Table D10. PhD Enrollment by Gender and Ethnicity, From 153 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	5,583	1,405	79	61	64	604	111	0	66	64	435	214	0	55	46	8,431	60.5%
Amer Indian or Alaska Native	29	10	0	0	1	4	2	0	0	1	0	2	0	0	0	47	0.3%
Asian	706	194	16	8	9	64	12	0	7	7	56	40	0	7	9	1,088	7.8%
Black or African-American	95	50	5	1	2	9	9	0	1	5	22	26	0	3	6	216	1.5%
Native Hawaiian/Pac Islander	5	2	0	0	0	1	0	0	0	0	6	1	0	1	0	15	0.1%
White	2,585	482	75	28	22	203	34	0	22	20	258	155	0	33	34	3,792	27.2%
Multiracial, not Hispanic	55	11	3	1	1	10	1	0	1	1	5	8	0	1	2	93	0.7%
Hispanic, any race	162	32	10	2	2	22	4	0	2	2	13	15	0	2	3	258	1.9%
Total Res & Ethnicity Known	9,220	2,186	188			917	173	-			795	461	0			13,940	
Resident, ethnicity unknown	469	103	16			9	1	-			208	43	0			849	
Not Reported (N/R)	373	72	165			17	0	-			41	13	0			608	
Gender Totals	10,062	2,361	296			943	174	-			1,044	517	0			15,397	
%	81.0%	19.0%				84.4%	15.6%				66.9%	33.1%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Table D4 also indicates the areas of specialty of new Ph.D.s. Artificial intelligence, networks, software engineering and databases continue to be the most popular areas of

specialization for doctoral graduates. But this year the order is different. Software engineering moved from third to first, followed by artificial intelligence, databases and networks.

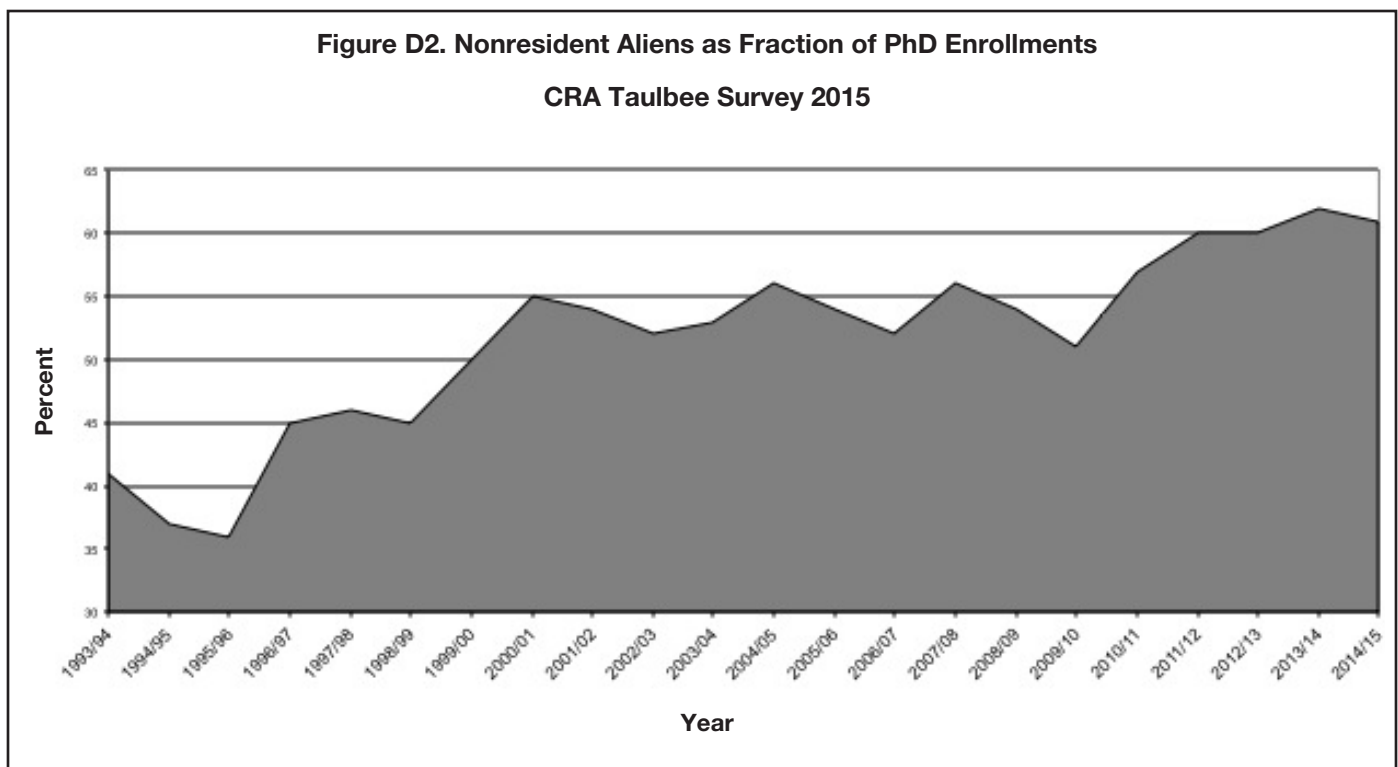
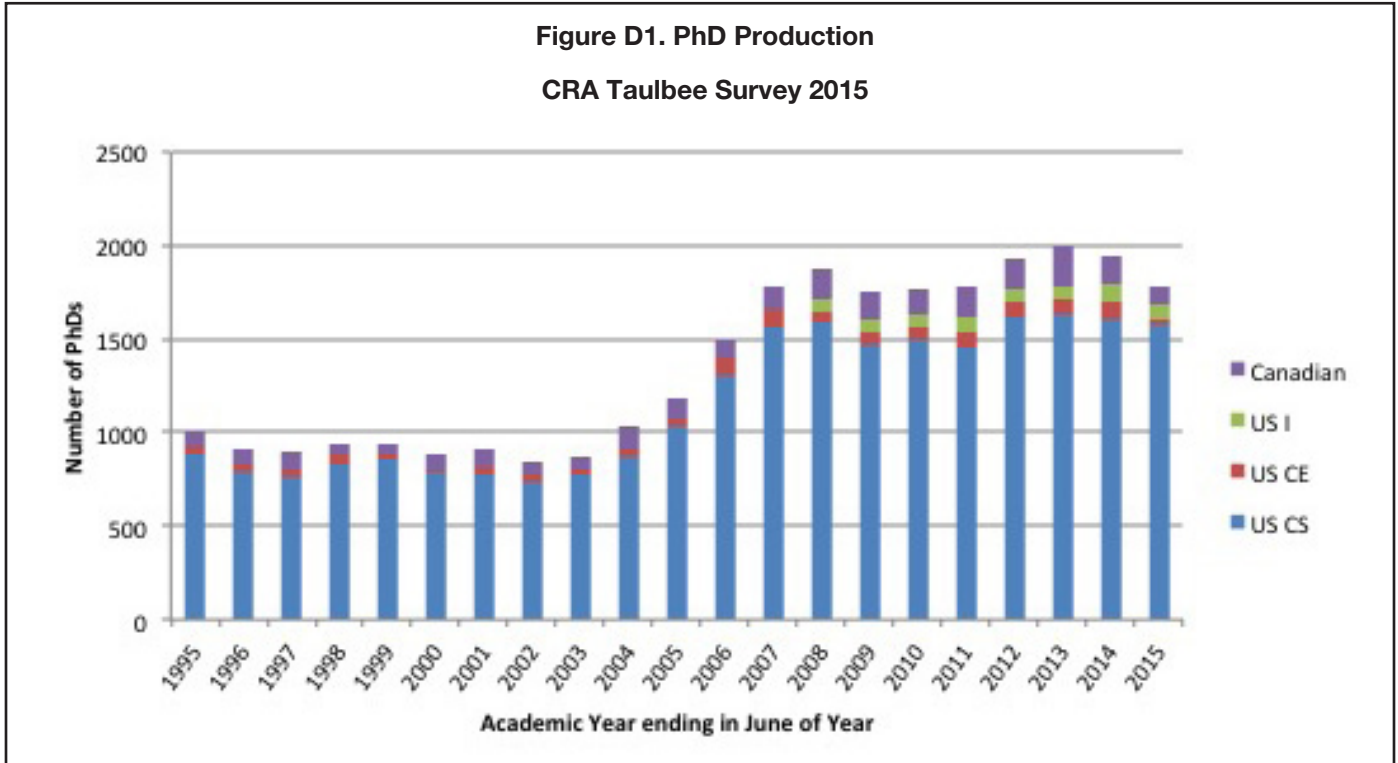


Figure D3. PhD Degrees Granted by Tenure-Track Size

CRA Taulbee Survey 2015

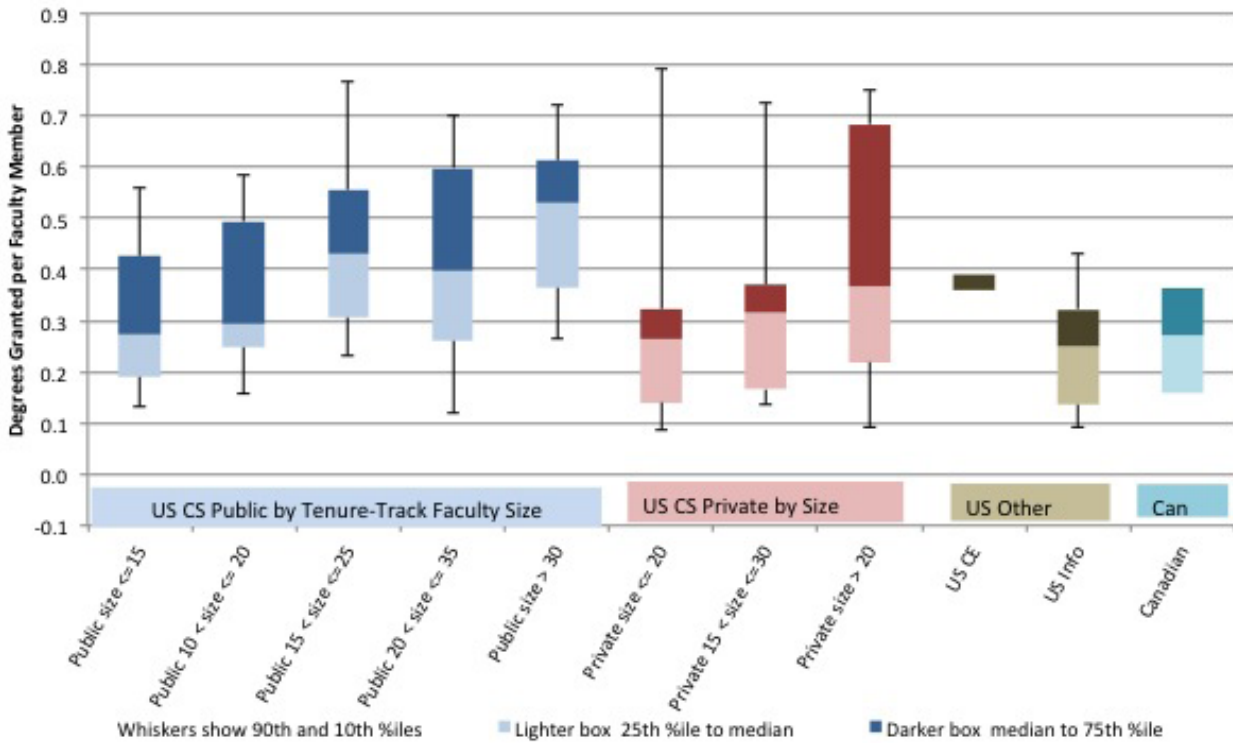


Figure D4. PhD Enrollment Normalized by Tenure-Track Size

CRA Taulbee Survey 2015

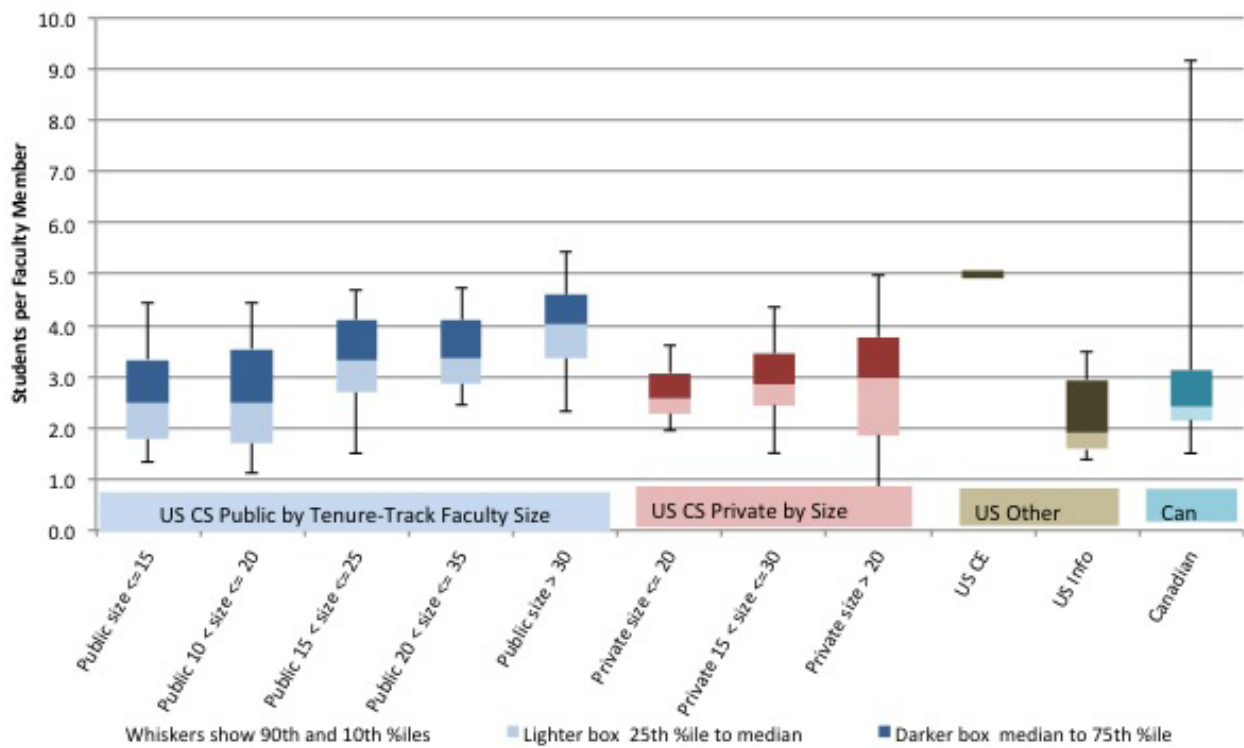


Figure D5. CS Pipeline corrected for year of entry

CRA Taulbee Survey 2015

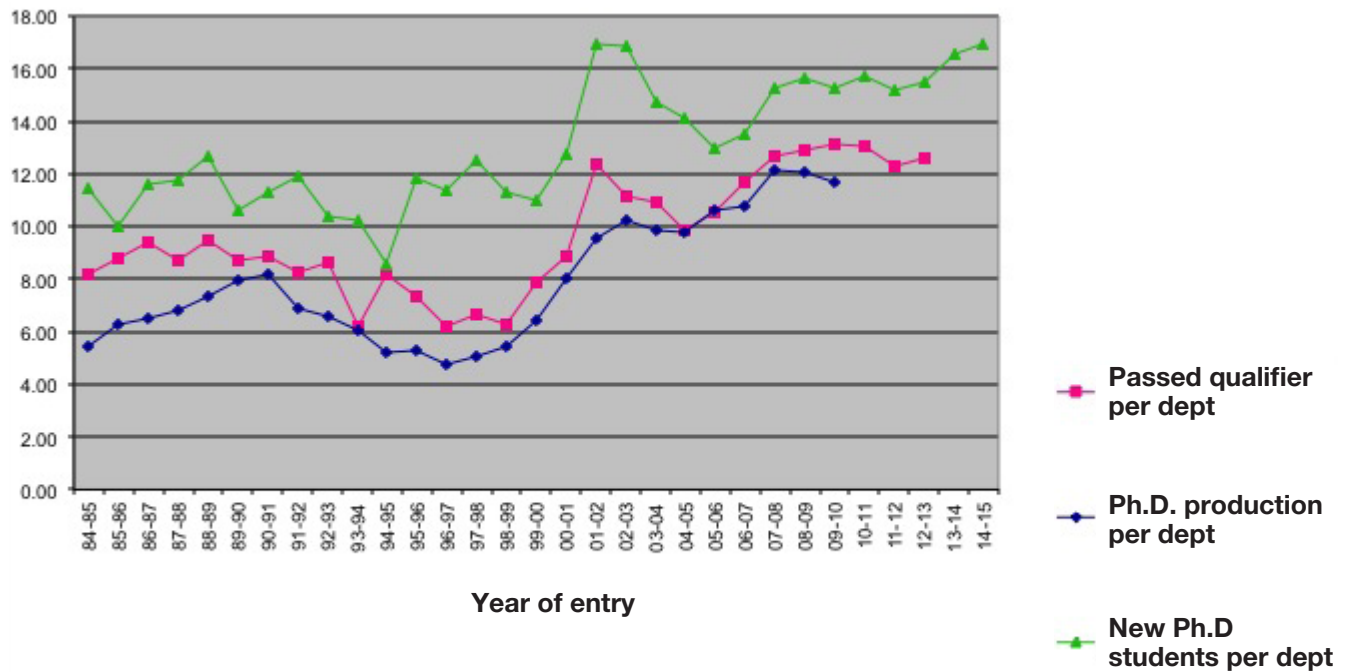
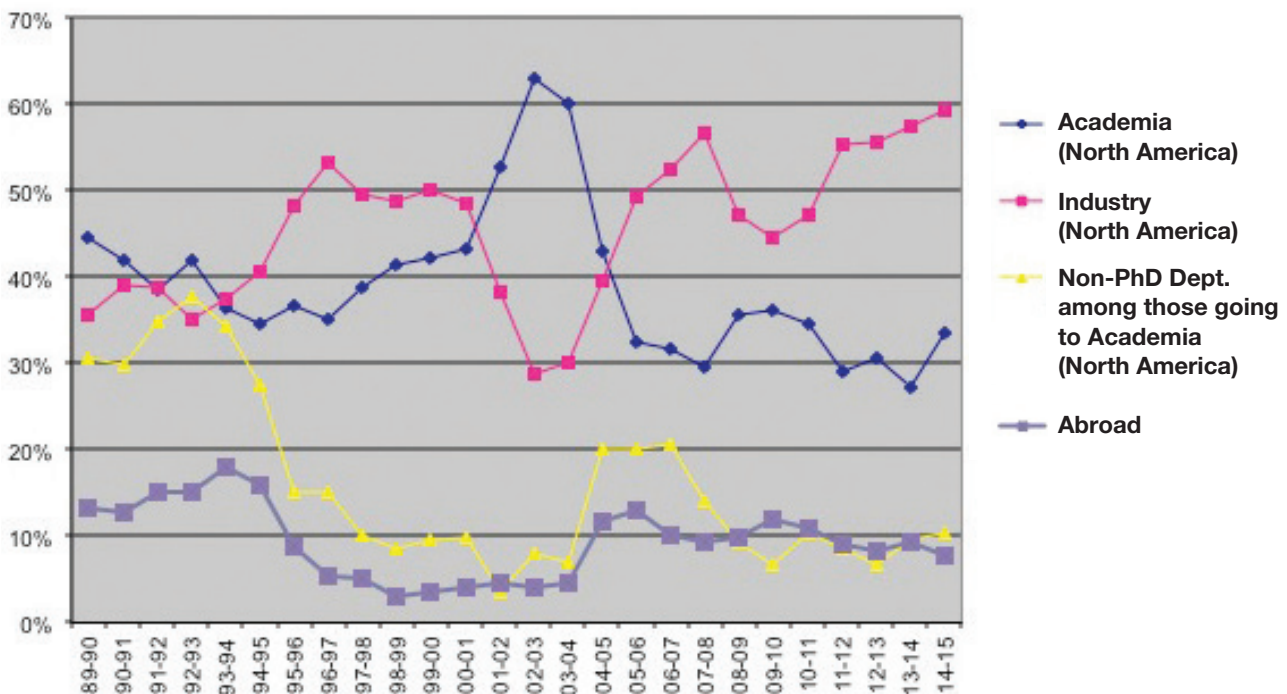


Figure D6. Employment Trends for New Ph.D.s

CRA Taulbee Survey 2015



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 enrolled students reported herein only reflect departments that offer the doctoral degree, the trends

observed in the master's and bachelor's data from these departments tend to strongly reflect trends in the larger population of programs that offer such degrees.

Master's (Tables MI-M8; Figures MI-M2)

On a per-department basis, CS master's degree production in U.S. CS departments rose nearly 25% in 2014-15; this follows

Table M1. Master's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
		Count	%	Count	%	Count	%	Count	%
US CS Public	100	5,410	54.5%	350	57.0%	785	31.6%	6,545	50.2%
US CS Private	38	3,855	38.8%	84	13.7%	347	13.9%	4,286	32.9%
Total US CS	138	9,265	93.3%	434	70.7%	1,132	45.5%	10,831	83.1%
US CE	6	0	0.0%	178	29.0%	0	0.0%	178	1.4%
US Info	11	286	2.9%	0	0.0%	1,208	48.6%	1,494	11.5%
Canadian	11	382	3.8%	2	0.3%	148	5.9%	532	4.1%
Grand Total	166	9,933		614		2,488		13,035	

Table M2. Master's Degrees Awarded by Gender

	CS		CE		I		Total	
	Count	%	Count	%	Count	%	Count	%
Male	7,268	75.1%	467	76.1%	1,294	52.0%	9,029	70.7%
Female	2,404	24.9%	147	23.9%	1,194	48.0%	3,745	29.3%
Total Known Gender	9,672		614		2,488		12,774	
Gender Unknown	261		0		0		261	
Grand Total	9,933		614		2,488		13,035	

Table M3. Master's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
	Count	%	Count	%	Count	%	Count	%
Nonresident Alien	6,076	68.1%	404	67.4%	757	33.3%	7,237	61.4%
Amer Indian or Alaska Native	48	0.5%	1	0.2%	13	0.6%	62	0.5%
Asian	958	10.7%	72	12.0%	176	7.7%	1,206	10.2%
Black or African-American	110	1.2%	6	1.0%	154	6.8%	270	2.3%
Native Hawaiian/Pac Island	3	0.0%	0	0.0%	3	0.1%	6	0.1%
White	1,534	17.2%	102	17.0%	1,039	45.7%	2,675	22.7%
Multiracial, not Hispanic	53	0.6%	0	0.0%	19	0.8%	72	0.6%
Hispanic, any race	141	1.6%	14	2.3%	111	4.9%	266	2.3%
Total Residency & Ethnicity Known	8,923		599		2,272		11,794	
Resident, ethnicity unknown	255		12		192		459	
Residency unknown	755		3		24		782	
Grand Total	9,933		614		2,488		13,035	

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

Department Type	# Depts	CS		CE		I		Total	
US CS Public	98	5,301	57.8%	297	58.9%	521	20.3%	6,119	50.0%
US CS Private	34	3,477	37.9%	63	12.5%	356	13.9%	3,896	31.8%
Total US CS	132	8,778	95.7%	360	71.4%	877	34.2%	10,015	81.8%
US CE	4	0	0.0%	127	25.2%	0	0.0%	127	1.0%
US Info	11	40	0.4%	0	0.0%	1,691	65.8%	1,731	14.1%
Canadian	12	352	3.8%	17	3.4%	0	0.0%	369	3.0%
Grand Total	159	9,170		504		2,568		12,242	

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	6,329	100	63.3	277	19	14.6	691	13	53.2	7,297	100	73.0	4,693	64.3%
US CS Private	3,241	35	92.6	68	5	13.6	284	3	94.7	3,593	35	102.7	2,201	61.3%
Total US CS	9,570	135	70.9	345	24	14.4	975	16	60.9	10,890	135	80.7	6,894	63.3%
US CE	0	0	0.0	273	5	54.6	0	0	0.0	273	5	54.6	220	80.6%
US Info	16	1	16.0	0	0	0.0	1,440	11	130.9	1,456	11	132.4	472	32.4%
Canadian	354	12	29.5	6	2	3.0	0	0	0.0	360	12	30.0	228	63.3%
Grand Total	9,940	148	67.2	624	31	20.1	2,415	27	89.4	12,979	163	79.6	7,814	60.2%

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	14,696	102	144.1	834	24	34.8	1,880	15	125.3	17,410	102	170.7
US CS Private	8,954	37	242.0	146	5	29.2	1,253	4	313.3	10,353	37	279.8
Total US CS	23,650	139	170.1	980	29	33.8	3,133	19	164.9	27,763	139	199.7
US CE	0	0	0.0	958	5	191.6	0	0	0.0	958	5	191.6
US Info	97	1	97.0	0	0	0.0	3,799	11	345.4	3,896	11	354.2
Canadian	985	11	89.5	22	1	22.0	282	2	141.0	1,289	11	117.2
Grand Total	24,732	151	163.8	1,960	35	56.0	7,214	32	225.4	33,906	166	204.3

two consecutive years of relatively flat production. Both public and private departments reported large increases.

Overall production of master's degrees in the information area declined in 2014-15, following two consecutive years of growth. U.S. public CS departments showed an increased production of information Master's degrees, while U.S. private CS departments reported decreases. U.S. I departments also reported decreased production of information master's degrees, the opposite of what took place last year (Table M1).

The proportion of female graduates among master's degree recipients rose in CS from 22.0 percent to 24.9 percent, and this resulted in a slight rise in the overall percentage of master's degrees to women, from 28.7 to 29.3 (Table M2). In the information area, the percentage of the master's recipients that were Non-resident Aliens increased in 2014-15 to 33.3 percent as compared with 28.1 percent 2013-14. In CS, 68.1 percent of the master's degrees went to Non-resident

Aliens, similar to the 67.8 percent in 2013-14. In both CS and I, the fraction of master's degrees going to Whites declined (Table M3).

Again this year, Non-resident Aliens comprised a much larger proportion of female CS degree recipients than male CS degree recipients, while Whites comprised a larger percentage of male CS degree recipients than female CS degree recipients (Table M7). With somewhat differing percentages, the same observations held for CE master's graduates. In the I area, Non-resident Aliens again comprised a larger percentage of male master's graduates than female master's graduates, and Whites comprised a smaller fraction of male master's graduates than female master's graduates. The current enrollment breakdown by gender and ethnicity (Table M8) suggests that these observations will continue to be reflected in master's recipients in the near future.

Table M7. Master's Degrees Awarded by Gender and Ethnicity, From 147 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	4,401	1,627	48	66	74	291	113	0	64	77	428	329	0	37	29	7,237	61.4
Amer Indian or Alaska Native	42	6	0	1	0	1	0	0	0	0	8	5	0	1	0	62	0.5
Asian	705	245	8	11	11	56	16	0	12	11	88	88	0	8	8	1,206	10.2
Black or African-American	73	37	0	1	2	5	1	0	1	1	72	82	0	6	7	270	2.3
Native Hawaiian/Pac Islander	3	0	0	0	0	0	0	0	0	0	2	1	0	0	0	6	0.1
White	1,263	258	13	19	12	86	16	0	19	11	468	571	0	41	51	2,675	22.7
Multiracial, not Hispanic	36	16	1	1	1	0	0	0	0	0	7	12	0	1	1	72	0.6
Hispanic, any race	115	25	1	2	1	14	0	0	3	0	74	37	0	7	3	266	2.3
Total Res & Ethnicity Known	6,638	2,214	71			453	146	0			1,147	1,125	0			11,794	
Resident, ethnicity unknown	190	64	1			12	0	0			130	62	0			459	
Not Reported (N/R)	440	126	223			2	1	0			17	7	0			782	
Gender Totals	7,268	2,404	261			467	147	0			1,294	1,194	0			13,035	
%	75.1%	24.9%				76.1%	23.9%				52.0%	48.0%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

There were increases in the average number of new master's students enrolled in U.S. CS departments. U.S. CS departments at both public and private institutions experienced these increases (Table M5). For departments at public institutions, this represents the fourth straight year of increases. This suggests further increased production of master's degrees in the next couple of years.

The fraction of new master's students in U.S. CS departments that is reported to be from outside North America declined slightly, from 64.5 percent in 2014-15 to 63.3 percent in 2015-16 (Table M5). At U.S. information departments, the fraction of new master's students from outside North America decreased from 43.5 percent to 32.4 percent, following two consecutive years of increase.

Table M8. Master's Enrollment by Gender and Ethnicity, From 139 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	9,977	4,283	195	63	76	836	242	0	53	74	1,470	1,050	0	40	35	18,053	59.5
Amer Indian or Alaska Native	19	7	1	0	0	3	1	0	0	0	4	2	0	0	0	37	0.1
Asian	1,261	472	23	8	8	120	19	0	8	6	305	188	1	8	6	2,389	7.9
Black or African-American	299	91	11	2	2	49	5	0	3	2	227	189	0	6	6	871	2.9
Native Hawaiian/Pac Islander	7	0	0	0	0	0	1	0	0	0	2	2	0	0	0	12	0.0
White	3,679	600	74	23	11	397	41	0	25	13	1,439	1,370	0	39	46	7,600	25.0
Multiracial, not Hispanic	111	30	0	1	1	21	4	0	1	1	35	46	0	1	2	247	0.8
Hispanic, any race	506	126	19	3	2	140	14	0	9	4	205	137	0	6	5	1,147	3.8
Total Res & Ethnicity Known	15,859	5,609	323			1,566	327	0			3,687	2,984	1			30,356	
Resident, ethnicity unknown	541	134	51			30	14	0			295	171	0			1,236	
Not Reported (N/R)	1,435	382	592			15	8	0			55	21	0			2,314	
Gender Totals	17,835	6,125	772			1,611	349	0			4,037	3,176	1			33,906	
%	74.4%	25.6%				82.2%	17.8%				56.0%	44.0%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Figure M1. Master's Degrees Granted by Tenure-Track Size
CRA Taulbee Survey 2015

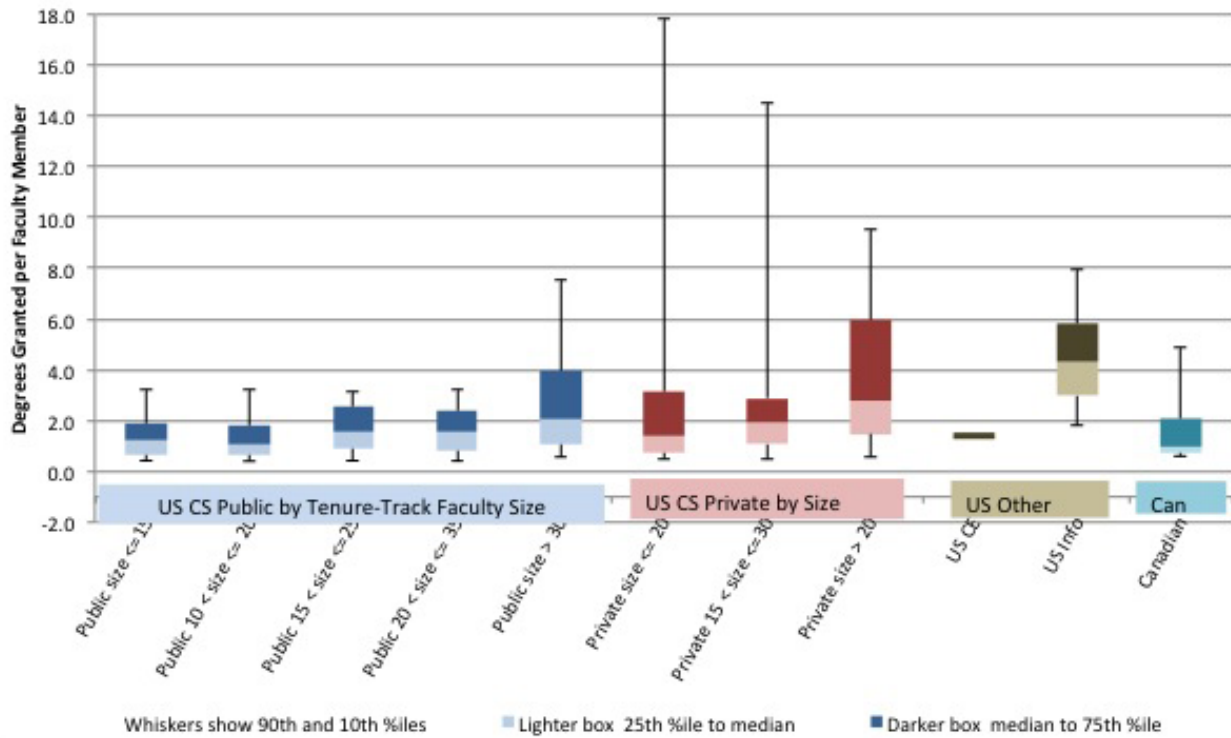
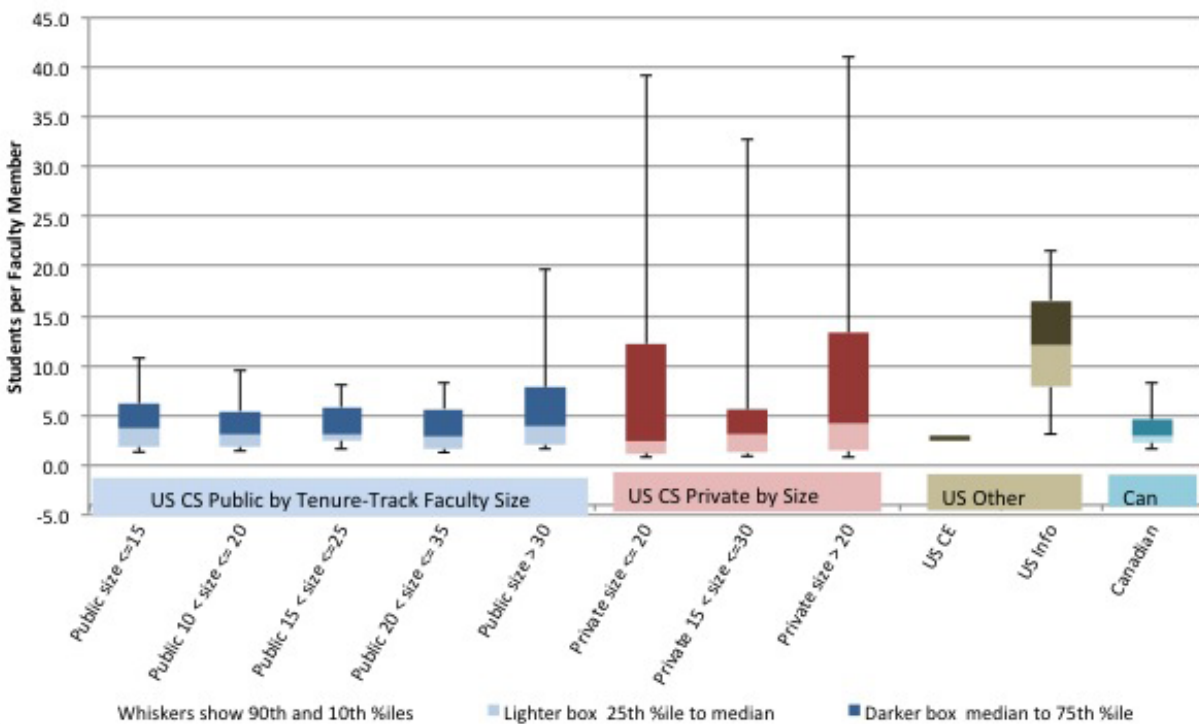


Figure M2. Master's Enrollment Normalized by Tenure-Track Size
CRA Taulbee Survey 2015



Bachelor's (Tables I, BI-B8; Figures BI-B4)

When comparing all departments reporting this year to all departments reporting last year, there was an increase in bachelor's degree production of 26.9 percent overall, and 21.6 percent per department. When considering only those departments that reported both years, the increase was

22.2 percent. Among U.S. computer science departments, the increases were 21.8 percent overall and 14.7 percent per department when comparing totals for all reporting departments. The increase was 17.7 percent for those U.S. CS departments that reported both years (Table 1).

Table 1. Degree Production and Enrollment Change From Previous Year

	Total						Only Departments Responding Both Years					
	US CS Only			All Departments			US CS Only			All Departments		
	2014	2015	% chg	2014	2015	% chg	2014	2015	% chg	2014	2015	% chg
PhDs												
# Departments	137	140	2.2%	173	170	-1.7%	122	122		151	151	
PhD Awarded	1,606	1,570	-2.2%	1,940	1,780	-8.2%	1,486	1,490	0.3%	1,746	1,685	-3.5%
# Departments	135	136		170	164		119	119		145	145	
PhD Enroll	12,633	13,063	3.4%	15,066	15,397	2.2%	11,783	11,804	0.2%	13,838	13,986	1.1%
# Departments	135	137		169	166		121	121		148	148	
New PhD Enroll	2,445	2,475	1.2%	2,820	2,752	-2.4%	2,207	2,251	2.0%	2,528	2,528	0.0%
# Departments	134	133		170	162		116	116		145	145	
Bachelor's												
# Departments	130	138	6.2%	162	166	2.5%	118	118		144	144	
BS Awarded	14,283	17,401	21.8%	17,237	21,880	26.9%	13,561	15,966	17.7%	16,333	19,964	22.2%
# Departments	129	137		158	165		116	116		140	140	
BS Enrollment	80,324	98,377	22.5%	96,660	119,919	24.1%	75,801	85,318	12.6%	91,199	105,282	15.4%
# Departments	128	138		167	165		116	116		140	140	
New BS Majors	20,351	25,256	24.1%	25,595	30,147	17.8%	18,798	22,015	17.1%	23,472	26,839	14.3%
# Departments	115	123		145	147		100	100		123	123	
BS Enroll/Dept	627.5	712.9	13.6%	578.8	726.8	25.6%	653.5	735.5	12.6%	651.4	752.0	15.4%

Table B1. Bachelor's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	100	10,468	68.6%	1,686	64.9%	1,620	40.2%	13,774	63.0%
US CS Private	36	3,046	20.0%	245	9.4%	336	8.3%	3,627	16.6%
Total US CS	136	13,514	88.6%	1,931	74.3%	1,956	48.6%	17,401	79.5%
US CE	7	0	0.0%	601	23.1%	143	3.6%	744	3.4%
US Info	10	90	0.6%	0	0.0%	1,485	36.9%	1,575	7.2%
Canadian	11	1,652	10.8%	66	2.5%	442	11.0%	2,160	9.9%
Grand Total	164	15,256		2,598		4,026		21,880	

Table B2. Bachelor's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	12,509	84.3%	2,235	88.4%	3,129	78.3%	17,873	83.7%
Female	2,325	15.7%	293	11.6%	869	21.7%	3,487	16.3%
Total Known Gender	14,834		2,528		3,998		21,360	
Gender Unknown	422		70		28		520	
Grand Total	15,256		2,598		4,026		21,880	

Table B3. Bachelor's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	1,053	8.8%	188	8.6%	253	7.4%	1,494	8.5%
Amer Indian or Alaska Native	48	0.4%	6	0.3%	5	0.1%	59	0.3%
Asian	2,734	22.8%	553	25.3%	534	15.7%	3,821	21.8%
Black or African-American	425	3.5%	81	3.7%	297	8.7%	803	4.6%
Native Hawaiian/Pac Islander	42	0.4%	11	0.5%	21	0.6%	74	0.4%
White	6,589	55.0%	1,103	50.5%	1,821	53.6%	9,513	54.2%
Multiracial, not Hispanic	248	2.1%	36	1.6%	95	2.8%	379	2.2%
Hispanic, any race	835	7.0%	206	9.4%	373	11.0%	1,414	8.1%
Total Residency & Ethnicity Known	11,974		2,184		3,399		17,557	
Resident, ethnicity unknown	718		53		150		921	
Residency unknown	2,564		361		477		3,402	
Grand Total	15,256		2,598		4,026		21,880	

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

Department Type	# Depts	CS		CE		I		Total	
US CS Public	95	11,885	65.5%	1,809	73.0%	1,365	43.5%	15,059	63.4%
US CS Private	30	3,735	20.6%	244	9.8%	268	8.5%	4,247	17.9%
Total US CS	125	15,620	86.1%	2,053	82.8%	1,633	52.0%	19,306	81.3%
US CE	4	0	0.0%	358	14.4%	0	0.0%	358	1.5%
US Info	9	82	0.5%	0	0.0%	1,497	47.7%	1,579	6.6%
Canadian	11	2,432	13.4%	68	2.7%	8	0.3%	2,508	10.6%
Grand Total	149	18,134		2,479		3,138		23,751	

This marks the second consecutive year of double-digit percentage increases in bachelor's degree production. It is a natural outgrowth of the booming bachelor's enrollments reported for the past several years.

For the eighth straight year, there was an increase in the number of new undergraduate computing majors. This year's respondents reported 17.8 percent more new majors (16.2 percent per department) than did last year's respondents. The increase is 14.3 percent when considering only those departments reporting both this year and last year. Among U.S. computer science departments, the increase was 24.1 percent overall (16.0 percent per department), and 17.1 percent among departments reporting

both this year and last year. Figure B2 illustrates the trend in the total number of newly declared CS/CE undergraduate majors as reported in the Taulbee Survey. Over the past four years, this number has almost doubled, and now exceeds the levels reported during the dot-com boom period.

Total undergraduate enrollment in computing majors among U.S. CS departments (i.e., the sum of the number of majors in CS, CE and I at these departments) increased 22.5 percent (13.6 percent per department) when all respondents are compared, and increased 12.6 percent among departments reporting both this year and last year. Aggregate total enrollment (which combines CS departments, CE departments, I departments and Canadian departments) once

Table B5. New Bachelor's Students by Department Type

Department Type	CS				CE				I				Total	
	Major	Pre-major	# Dept	Avg. Major /Dept	Total	Pre-major	# Dept	Avg. Major /Dept	Total	Pre-major	# Dept	Avg. Major /Dept	Total Major	Avg. Major / Dept
US CS Public	15,515	8,842	90	172.4	2,332	1,003	28	83.3	929	146	23	40.4	18,776	208.6
US CS Private	5,516	1,449	30	183.9	569	10	6	94.8	395	10	4	98.8	6,480	216.0
US CS Total	21,031	10,291	120	175.3	2,901	1,013	34	85.3	1,324	156	27	49.0	25,256	210.5
US CE	0	0	0	0.0	484	313	6	80.7	0	0	0	0.0	484	80.7
US Information	288	0	1	288.0	0	0	0	0.0	716	112	8	89.5	1,004	125.5
Canadian	3,138	901	10	313.8	250	0	2	125.0	15	0	1	15.0	3,403	340.3
Grand Total	24,457	11,192	131	186.7	3,635	1,326	42	86.5	2,055	268	36	57.1	30,147	209.4

Table B6. Total Bachelor's Enrollment by Department Type

Department Type	CS				CE				I				Total	
	Major	Pre-major	# Dept	Avg. Major per Dept.	Total	Pre-major	# Dept	Avg. Major per Dept.	Total	Pre-major	# Dept	Avg. Major per Dept.	Total Major	Avg. Major per Dept
US CS Public	61,039	16,320	101	604.3	8,874	1,816	34	261.0	7,353	647	26	282.8	77,266	765.0
US CS Private	18,698	1,603	37	505.4	938	17	9	104.2	1,475	4	4	368.8	21,111	570.6
US CS Total	79,737	17,923	138	577.8	9,812	1,833	43	228.2	8,828	651	30	294.3	98,377	712.9
US CE	0	0	0	0.0	3,133	471	7	447.6	729	0	1	729.0	3,862	551.7
US Information	705	0	1	705.0	0	0	0	0.0	4,064	674	10	406.4	4,769	476.9
Canadian	9,678	1,080	10	967.8	191	0	1	191.0	3,042	0	3	1,014.	12,911	1291.1
Grand Total	90,120	19,003	149	604.8	13,136	2,304	51	257.6	16,663	1,325	44	378.7	119,919	726.8

again increased in all three computing areas (CS, CE, and I), although the increase in CE was only just over 2 percent (Table B6). New student enrollment also increased once again in all three areas (Table B5).

The proportion of women among bachelor's graduates in CS rose from 14.1 percent in 2013-14 to 15.7 percent in 2014-15. In CE, the percentage of female bachelor's graduates was 11.6, the same as it was two years ago (it was 11.2 percent last year). There also was an increase in the percentage of I degrees going to women from 20.3 percent to 21.7 percent (Table B2). The fraction of CS bachelor's degrees awarded to Whites declined from 57.7 percent in 2013-14 to 55.0 percent in 2014-15, and the percentage awarded to Asians rose from 21.1 percent to 22.8 percent. Changes in other ethnicity categories

were less than one percent in CS. In aggregate across the three degree areas, 54.2 percent of the graduates were White, 21.8 percent Asian, 8.5 percent Non-resident Aliens, and 15.5 percent all other ethnicity categories combined. However, in I programs, the other ethnicity categories accounted for over 23 percent of the graduates (Table B3).

In all three computing areas (CS, CE and I), Resident Asians and Non-resident Aliens comprise a larger fraction of female degree recipients than male recipients, while Whites comprise a larger fraction of male degree recipients than female recipients (Table B7). Table B8 indicates that the same comparisons hold true for total bachelor's enrollment. We observed these same results in last year's report.

Table B7. Bachelor's Degrees Awarded by Gender and Ethnicity, From 125 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	800	245	8	8	13	159	29	0	8	11	165	87	1	6	12	1,494	8.5
Amer Indian or Alaska Native	40	8	0	0	0	4	2	0	0	1	5	0	0	0	0	59	0.3
Asian	2,126	600	8	21	32	472	81	0	25	31	379	139	16	15	19	3,821	21.8
Black or African-American	312	108	5	3	6	75	6	0	4	2	226	66	5	9	9	803	4.6
Native Hawaiian/Pac Islander	30	12	0	0	1	7	4	0	0	2	14	7	0	1	1	74	0.4
White	5,818	738	33	58	40	991	112	0	52	43	1,454	350	17	56	48	9,513	54.2
Multiracial, not Hispanic	203	42	3	2	2	29	7	0	2	3	69	24	2	3	3	379	2.2
Hispanic, any race	720	109	6	7	6	186	20	0	10	8	303	64	6	12	9	1,414	8.1
Total Res & Ethnicity Known	10,049	1,862	63			1,923	261	0			2,615	737	47			17,557	
Resident, ethnicity unknown	572	111	35			47	6	0			124	18	8			921	
Not Reported (N/R)	1,888	352	362			265	26	70			390	114	27			3,402	
Gender Totals	12,509	2,325	422			2,235	293	70			3,129	869	28			21,880	
%	84.3%	15.7%				88.4%	11.6%				78.3%	21.7%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Table B8. Bachelor's Enrollment by Gender and Ethnicity, From 121 Departments Providing Breakdown Data

	CS					CE					I					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	4,967	1,386	65	9	13	1,097	198	2	10	13	468	205	20	5	7	8,408	9.1
Amer Indian or Alaska Native	221	35	1	0	0	18	5	0	0	0	32	14	0	0	1	326	0.4
Asian	11,232	3,175	135	20	31	2,446	490	3	23	32	1,537	596	61	16	21	19,675	21.2
Black or African-American	2,840	760	70	5	7	503	95	2	5	6	906	313	47	9	11	5,536	6.0
Native Hawaiian/Pac Islander	153	34	0	0	0	41	10	0	0	1	62	19	0	1	1	319	0.3
White	30,193	3,847	334	54	37	5,224	543	1	49	35	5,273	1,378	139	53	48	46,932	50.6
Multiracial, not Hispanic	1,567	329	8	3	3	233	39	0	2	3	234	72	7	2	3	2,489	2.7
Hispanic, any race	5,155	830	73	9	8	1,170	159	7	11	10	1,373	297	35	14	10	9,099	9.8
Total Res & Ethnicity Known	56,328	10,396	686			10,732	1,539	15			9,885	2,894	309			92,784	
Resident, ethnicity unknown	3,107	633	51			336	45	2			322	66	31			4,593	
Not Reported (N/R)	9,594	2,583	7,226			422	59	0			2,510	887	10			22,963	
Gender Totals	69,029	13,612	7,479			11,490	1,643	3			12,717	3,847	99			119,919	
%	83.5%	16.5%				87.5%	12.5%				76.8%	23.2%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Figure B1. BS Production (CS & CE)
CRA Taulbee Survey 2015

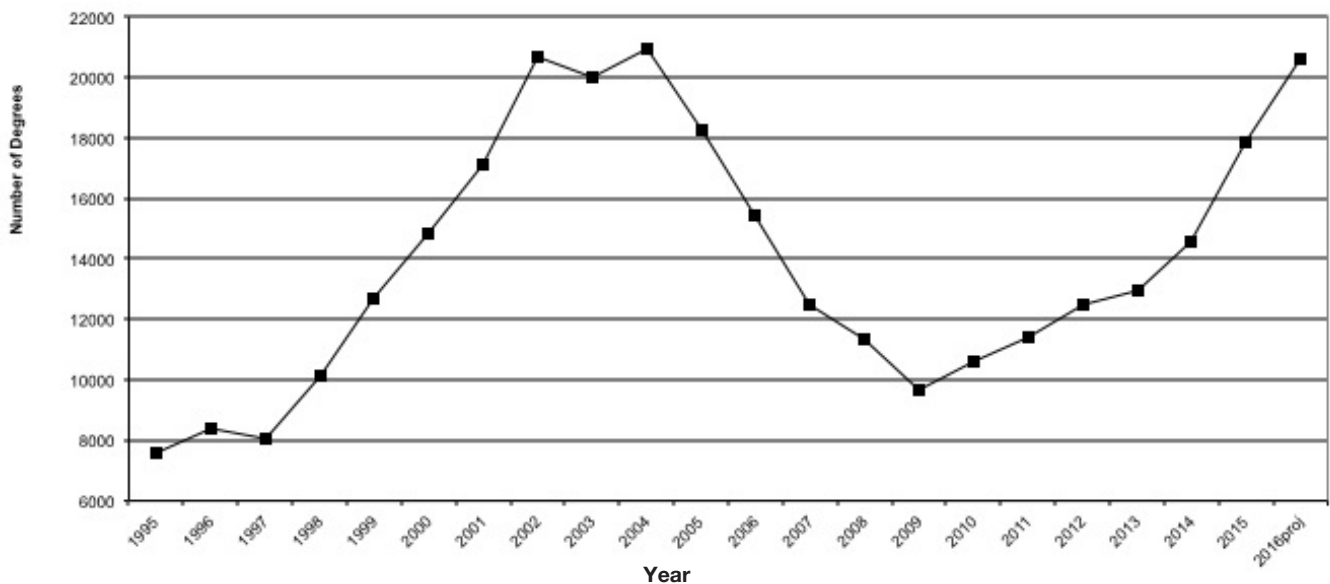


Figure B2. Newly Declared CS/CE Undergraduate Majors
CRA Taulbee Survey 2015

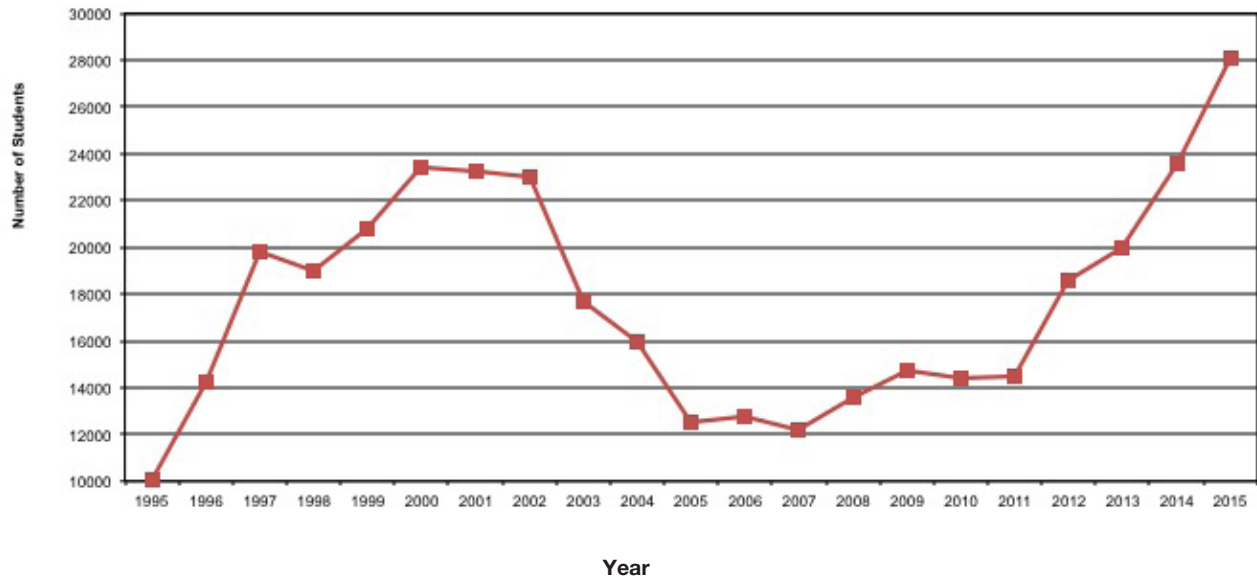


Figure B3. Bachelor's Degrees Granted by Tenure-Track Size
CRA Taulbee Survey 2015

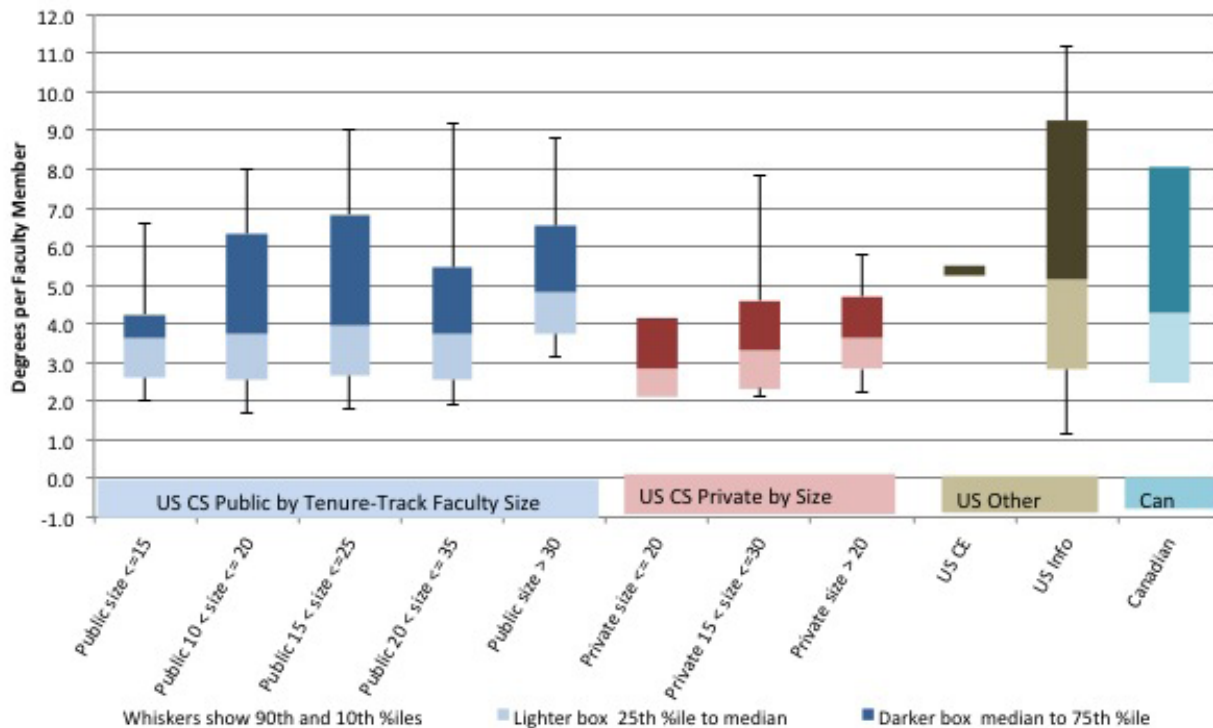
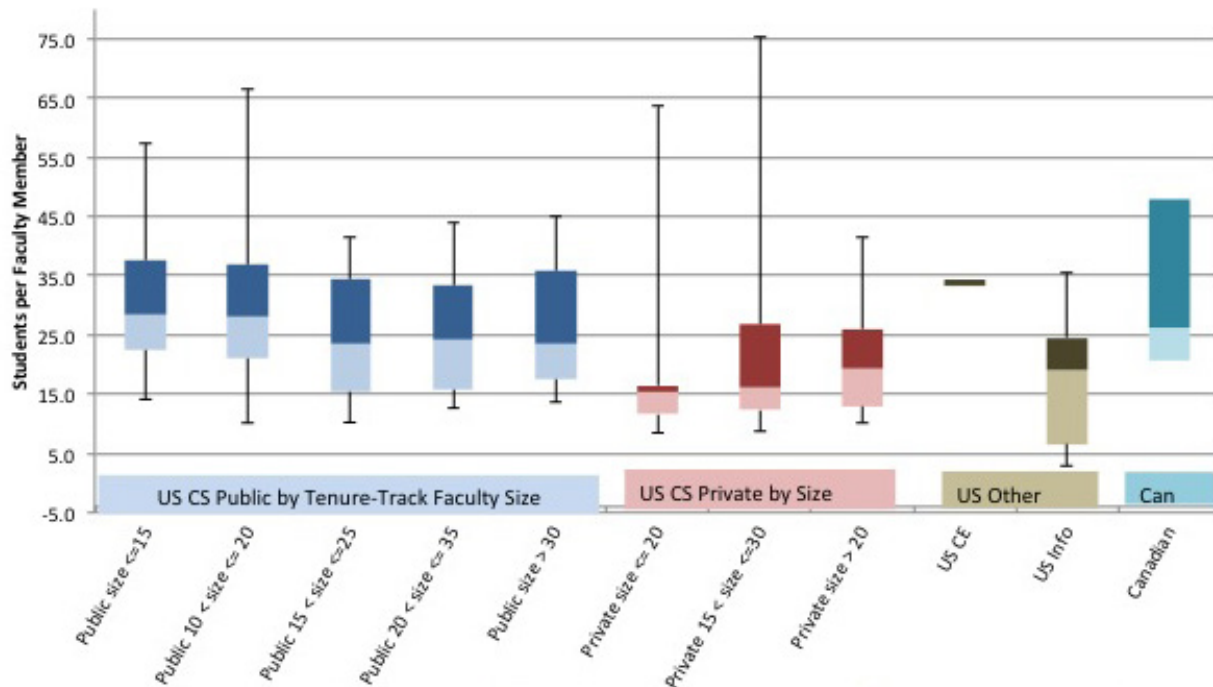


Figure B4. Bachelor's Enrollment Normalized by Tenure-Track Size

CRA Taulbee Survey 2015



Faculty Demographics (Tables FI-F9)⁴

Table FI shows the current and anticipated sizes, in FTE, for tenure-track, teaching and research faculty, and postdocs. The total tenure-track faculty count in U.S. CS departments (3,880) represents about a 9 percent increase over last year. The average tenure-track faculty size per U.S. CS department went from 27.4 to 28.1 during this period. In these departments, the average number of teaching faculty increased from 5.7 to 6.9 and the average number of postdocs increased from 6.0 to 6.5, while the average number of research faculty decreased from 6.1 to 5.4. Canadian, CE and I departments have much more volatile data due to the small number of departments reporting in each of those categories.

As we have mentioned in previous Taulbee reports, Canadian universities, on average, have several more tenure-track faculty members per department than do U.S. universities, while on average U.S. I departments and U.S. CE departments are somewhat smaller than U.S. CS departments. The

observations about U.S. CE and I departments 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.

Among U.S. CS departments, those at private universities tend to have more teaching faculty, research faculty and postdocs than do those at public universities on average. This observation also was made last year. However, this year the average tenure-track faculty size at public universities was slightly larger than that at private universities; this is a change from previous years.

Table F2 summarizes faculty hiring this past year. The success rate for hiring tenure-track faculty at U.S. CS departments fell from 80.2 percent in 2013-14 to 70.8 percent in 2014-15. Even with this decline the 2014-15 rate still was higher than that of two years ago. The success rate was almost identical at public and private departments. Again this year, Canadian departments had lower success rates on average than did U.S.

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

	Actual		Projected				Expected 2-Yr Growth	
	2015-2016		2016-2017		2017-2018		#	%
	Total	Average	Total	Average	Total	Average		
US CS Public								
TenureTrack	2,859	28.3	3,083	30.5	3,227	31.9	368	12.9%
Teaching	569	6.6	635	7.3	667	7.8	98	17.2%
Research	263	4.8	287	5.3	310	5.8	47	17.9%
Postdoc	311	5.5	355	5.9	384	6.5	73	23.5%
Total	3,991	39.5	4,351	43.1	4,580	45.3	589	14.8%
US CS Private								
TenureTrack	1,021	27.6	1,092	29.5	1,153	31.2	132	12.9%
Teaching	257	7.6	288	8.7	306	9.3	49	19.1%
Research	134	7.0	142	7.5	151	7.9	17	12.7%
Postdoc	224	9.0	244	9.8	256	10.2	32	14.3%
Total	1,632	44.1	1,764	47.7	1,864	50.4	232	14.2%
All US CS								
TenureTrack	3,880	28.1	4,175	30.3	4,380	31.7	500	12.9%
Teaching	826	6.9	923	7.7	973	8.2	147	17.8%
Research	396	5.4	429	5.9	460	6.4	64	16.2%
Postdoc	535	6.5	599	7.0	640	7.6	105	19.6%
Total	5,623	40.7	6,115	44.3	6,444	46.7	821	14.6%
US CE								
TenureTrack	105	15.1	117	16.8	126	18.0	21	20.0%
Teaching	15	2.4	17	2.8	18	2.9	3	20.0%
Research	10	2.4	10	2.5	11	2.6	1	10.0%
Postdoc	12	2.9	14	2.8	16	3.1	4	33.3%
Total	140	20.0	157	22.4	169	24.1	29	20.7%
US I								
TenureTrack	301	25.1	316	26.3	326	27.2	25	8.3%
Teaching	112	11.2	117	11.7	121	12.1	9	8.0%
Research	16	2.0	13	1.9	14	1.7	-2	-12.5%
Postdoc	27	3.0	27	3.4	26	2.9	-1	-3.7%
Total	454	37.8	473	39.4	485	40.4	31	6.8%
Canadian								
TenureTrack	425	35.4	437	36.4	441	36.8	16	3.8%
Teaching	62	5.6	62	6.2	62	6.2	0	0.0%
Research	10	2.5	9	2.3	8	2.7	-2	-20.0%
Postdoc	75	8.3	72	8.0	69	7.7	-6	-8.0%
Total	571	47.6	579	48.3	579	48.3	8	1.4%
Grand Total								
TenureTrack	4,711	27.9	5,045	29.9	5,273	31.2	562	11.9%
Teaching	1,014	6.9	1,118	7.7	1,173	8.1	159	15.7%
Research	432	4.8	461	5.2	492	5.7	60	13.9%
Postdoc	649	6.2	712	6.7	751	7.0	102	15.7%
Total	6,788	40.2	7,324	43.3	7,677	45.4	889	13.1%

Table F2. Vacant Positions 2014-2015 by Position and Department Type

	Tried to fill	Filled
US CS Public		
TenureTrack	261	185
Teaching	114	96
Research	73	70
Postdoc	81	75
Total	529	425
US CS Private		
TenureTrack	85	60
Teaching	46	37
Research	11	10
Postdoc	52	52
Total	194	159
All US CS		
TenureTrack	346	245
Teaching	160	133
Research	84	80
Postdoc	133	127
Total	723	584
US CE		
TenureTrack	8	7
Teaching	23	23
Research	16	16
Postdoc	11	11
Total	58	57
US I		
TenureTrack	25	18
Teaching	10	13
Research	1	2
Postdoc	13	18
Total	49	51
Canadian		
TenureTrack	32	20
Teaching	6	5
Research	0	0
Postdoc	24	24
Total	62	49
Grand Total		
TenureTrack	411	290
Teaching	199	174
Research	101	98
Postdoc	181	180
Total	892	741

CS, U.S. CE and U.S. I departments. In aggregate, the tenure-track hiring success rate fell from 78.8 percent to 70.6 percent.

Among those hired into all categories of academic positions (tenure-track, teaching faculty, research faculty and postdoc) in 2014-15, 21.6 percent were women, a slight decrease from the 22.1 percent in 2013-14 (Table F3). Considering only tenure-track positions, the proportion of women hired declined from 21.8 percent in 2013-14 to 20.3 percent in 2014-15. Only among research faculty positions was there an increase in the percentage of positions going to women as compared with those reported last year. The percentage of new female tenure-track and overall faculty hires is similar to the percentage of new female Ph.D.s produced this past year.

Among new tenure-track faculty, the fraction who are white declined from 49.5 percent to 44.8 percent, while the fraction who are Non-resident Alien or Asian new hires rose from 41.8 percent to 43.5 percent. Once again, whites dominated the newly hired teaching faculty, with Asians and Non-resident Aliens accounting for most of the remainder. Among research faculty, whites comprised 42.3 percent of new hires, while Non-resident Aliens or resident Asians in aggregate comprised 53.8 percent of new hires. Among postdoc new hires, whites comprised 19.8 percent, about half of what it was last year, with Non-resident Aliens and resident Asians collectively comprising 75.4 percent compared with just over 50 percent last year (Table F4).

There were slightly fewer faculty losses reported this year as compared with last year (Table F5). Retirements were the biggest reason for faculty loss, and were up substantially this year as compared with last year. Movement from one academic position to another was the next largest cause of faculty attrition.

The proportion of women at the full professor rank rose from 13.3 percent last year to 14.3 percent this year, while the proportion at the associate professor level rose from 20.5 to 22.1 percent. The proportion at the assistant professor level, however, fell from 24.6 to 23.7 percent (Table F6). There also were decreases in the proportion of women among teaching faculty and postdocs, while there was an increase in the proportion of women among research faculty. Whites, Asians and Non-resident Aliens account for more than 85 percent of each category of faculty members (Table F7).

Ninety-five percent of departments provided gender by ethnicity breakdowns for their current faculty members. (Tables F8 and F9). Whites again comprised a greater percentage of female full professors than they do male full professors, while the reverse is true at the associate professor level. Asians comprise a greater percentage of male full professors than they do female full professors.

For next year, U.S. CS departments forecast a 7.6 percent growth in tenure-track faculty, and an 11.7 percent growth in teaching faculty. They also forecast a 12.0 percent growth in postdocs.

Reason	# Reported	% of Reasons
Didn't find a good fit	35	26.3%
Offers turned down	53	39.8%
Technically vacant, not filled for admin reasons	7	5.3%
Hiring in progress	35	26.3%
Other	3	2.3%
Total Reasons Provided	133	

	Tenure-Track		Teaching		Research		Postdoc		Total	
	#	%	#	%	#	%	#	%	#	%
Male	255	79.7%	127	75.1%	39	75.0%	108	80.6%	529	78.4%
Female	65	20.3%	42	24.9%	13	25.0%	26	19.4%	146	21.6%
Unknown	0		1		1		14		16	
Total	320		170		53		148		691	

	Tenure-Track		Teaching		Research		Postdoc		Total	
	#	%	#	%	#	%	#	%	#	%
Nonresident Alien	46	15.9%	12	7.8%	14	26.9%	67	53.2%	139	22.3%
American Indian / Alaska Native	1	0.3%	0	0.0%	0	0.0%	0	0.0%	1	0.2%
Asian	80	27.6%	23	14.9%	14	26.9%	28	22.2%	145	23.3%
Black or African-American	9	3.1%	2	1.3%	0	0.0%	2	1.6%	13	2.1%
Native Hawaiian/ Pacific Islander	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
White	130	44.8%	112	72.7%	22	42.3%	25	19.8%	289	46.5%
Multiracial, not Hispanic	2	0.7%	0	0.0%	0	0.0%	1	0.8%	3	0.5%
Hispanic, any race	9	3.1%	2	1.3%	0	0.0%	1	0.8%	12	1.9%
Resident, race/ethnic unknown	13	4.5%	3	1.9%	2	3.8%	2	1.6%	20	3.2%
Total known residency	290		154		52		126		622	
Residency Unknown	30		16		1		22		69	
Total	320		170		53		148		691	

Died	8
Retired	94
Took Academic Position Elsewhere	77
Took Nonacademic Position	24
Remained, but Changed to Part Time	16
Other	10
Unknown	8
Total	237

	Full		Associate		Assistant		Teaching		Research		Postdoc		Total	
Male	2,003	85.7%	1,148	77.9%	739	76.3%	816	72.9%	371	79.6%	579	82.7%	5,656	80.0%
Female	335	14.3%	326	22.1%	229	23.7%	304	27.1%	95	20.4%	121	17.3%	1,410	20.0%
Unknown	18		2		1		0		1		5		27	
Total	2,356		1,476		969		1,120		467		705		7,093	

	Full		Associate		Assistant		Teaching		Research		Postdoc		Total	
Nonresident Alien	17	0.8%	11	0.8%	103	11.3%	23	2.2%	78	18.1%	275	45.0%	507	7.8%
American Indian / Alaska Native	1	0.0%	4	0.3%	4	0.4%	2	0.2%	0	0.0%	0	0.0%	11	0.2%
Asian	529	24.6%	417	31.2%	262	28.8%	116	10.9%	64	14.8%	108	17.7%	1,496	23.0%
Black or African-American	18	0.8%	33	2.5%	28	3.1%	39	3.7%	4	0.9%	8	1.3%	130	2.0%
Native Hawaiian/ Pacific Islander	9	0.4%	3	0.2%	6	0.7%	8	0.7%	0	0.0%	1	0.2%	27	0.4%
White	1,393	64.9%	774	57.9%	432	47.5%	812	76.0%	265	61.3%	179	29.3%	3,855	59.3%
Multiracial, not Hispanic	15	0.7%	6	0.4%	5	0.6%	4	0.4%	1	0.2%	1	0.2%	32	0.5%
Hispanic, any race	46	2.1%	32	2.4%	28	3.1%	25	2.3%	9	2.1%	5	0.8%	145	2.2%
Resident, race/ethnic unknown	120	5.6%	57	4.3%	41	4.5%	39	3.7%	11	2.5%	34	5.6%	302	4.6%
Total known residency	2,148		1,337		909		1,068		432		611		6,505	
Residency Unknown	208		139		60		52		35		94		588	
Total	2,356		1,476		969		1,120		467		705		7,093	

Table F8. Current Tenured and Tenure-Track Faculty by Gender and Ethnicity, From 170 Departments

	Full Professor					Associate Professor					Assistant Professor					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	14	3	0	1	1	8	3	0	1	1	81	22	0	12	10	131	3.1
Amer Indian or Alaska Native	1	0	0	0	0	2	2	0	0	1	2	2	0	0	1	9	0.2
Asian	463	60	6	27	21	322	94	1	33	33	198	63	1	30	30	1,208	28.9
Black or African-American	16	2	0	1	1	19	14	0	2	5	14	14	0	2	7	79	1.9
Native Hawaiian/Pac Islander	8	1	0	1	0	3	0	0	0	0	4	2	0	1	1	18	0.4
White	1,175	206	12	68	73	609	164	1	62	57	330	102	0	50	48	2,599	62.2
Multiracial, not Hispanic	14	1	0	1	0	6	0	0	1	0	2	3	0	0	1	26	0.6
Hispanic, any race	37	9	0	2	3	22	10	0	2	4	24	4	0	4	2	106	2.5
Total Res & Ethnicity Known	1,728	282	18			991	287	2			655	212	1			4,176	
Resident, ethnicity unknown	101	19	0			46	11	0			32	9	0			218	
Not Reported (N/R)	174	34	0			111	28	0			52	8	0			407	
Gender Totals	2,003	335	18			1,148	326	2			739	229	1			4,801	
%	85.7%	14.3%				77.9%	22.1%				76.3%	23.7%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Table F9. Current Non-Tenure-Track Faculty and Postdoctorates by Gender and Ethnicity, From 163 Departments

	Non-Tenure-Track Teaching					Non-Tenure-Track Research					Postdoctorates					Ethnicity Totals	
	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Male	Fem	N/R	% of M*	% of F*	Total	%
Nonresident Alien	18	5	0	2	2	62	16	0	19	19	226	48	1	48	48	376	19
Amer Indian or Alaska Native	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Asian	69	47	0	9	17	49	15	0	15	18	91	17	0	19	17	288	14
Black or African-American	29	10	0	4	4	3	1	0	1	1	3	5	0	1	5	51	3
Native Hawaiian/Pac Islander	4	4	0	1	1	0	0	0	0	0	0	1	0	0	1	9	0
White	605	207	0	81	74	215	49	1	64	58	152	26	1	32	26	1,256	62
Multiracial, not Hispanic	4	0	0	1	0	1	0	0	0	0	1	0	0	0	0	6	0
Hispanic, any race	20	5	0	3	2	5	4	0	2	5	1	4	0	0	4	39	2
Total Res & Ethnicity Known	750	279	0			335	85	1			474	101	2			2,027	
Resident, ethnicity unknown	29	10	0			8	3	0			25	9	0			84	
Not Reported (N/R)	37	15	0			28	7	0			80	11	3			181	
Gender Totals	816	304	0			371	95	1			579	121	5			2,292	
%	72.9%	27.1%				79.6%	20.4%				82.7%	17.3%					

* % of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known

Research Expenditures (Table R1; Figures R1-R2)

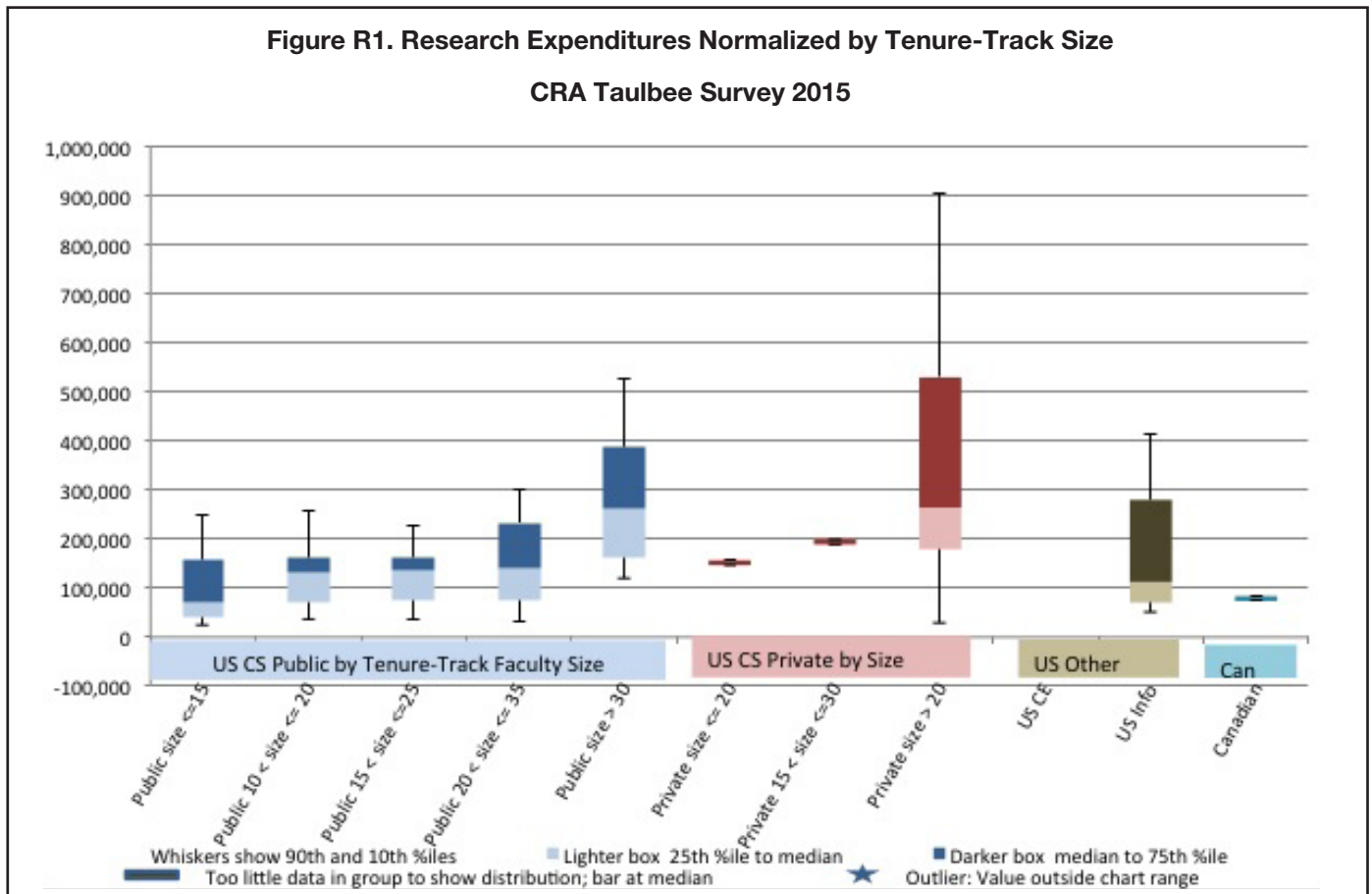
Table R1 shows the department's total expenditure (including indirect costs or "overhead" as stated on project budgets) from external sources of support. Figures R1 and R2 show the per capita expenditure, where capitation is computed two ways. The first (Figure R1) is relative to the number of tenure-track 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.

Overall median research expenditures for 2014-15 at U.S. CS public departments fell 10.7 percent in comparison with 2013-14. At U.S. CS departments in private institutions, median expenditures rose 37.6 percent. The median research expenditure at U.S. CS departments in private institutions is nearly twice that of public institutions. Median expenditures also fell at U.S. I departments and Canadian departments in comparison with 2013-14. It should be noted that for each department type, fewer departments provided research

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	72	\$608,907	\$1,758,770	\$3,528,438	\$8,278,021	\$15,596,967
US CS Private	21	\$1,506,373	\$2,936,144	\$6,883,862	\$13,380,854	\$20,150,000
US CE	3			\$2,330,244		
US Information	12	\$1,320,092	\$2,076,549	\$2,982,247	\$4,621,781	\$4,796,780
Canadian	8		\$1,898,335	\$3,289,450	\$5,621,809	

Figure R1. Research Expenditures Normalized by Tenure-Track Size
CRA Taulbee Survey 2015

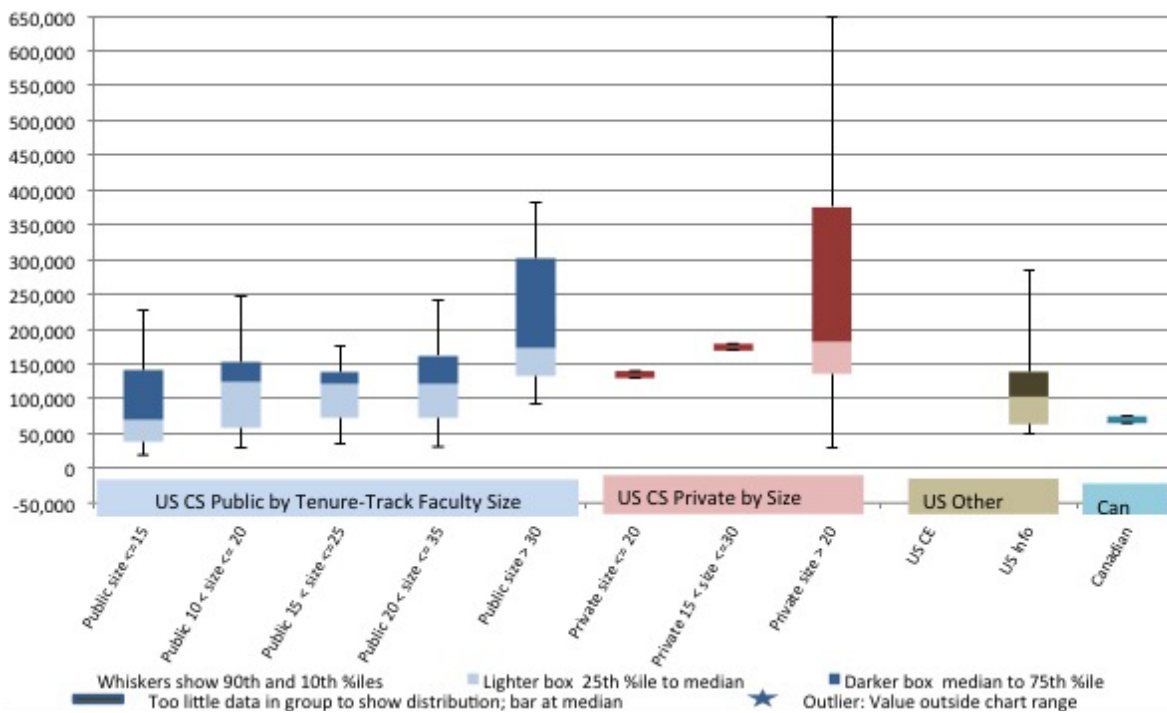


expenditure data this year than did so last year. This was especially true for U.S. CS departments. Furthermore, the I and Canadian departments are based on much smaller samples, which makes these comparisons subject to more volatility. There was an insufficient number of CE departments reporting to be able to report any meaningful comparative results.

capita is received by the department. The effect of size of the department on research expenditures per capita at private institutions is hard to assess, because very few small departments at these institutions provided research expenditure data this year

The U.S. CS data for public institutions indicate that the larger the department, the more external funding per

Figure R2. Research Expenditures Normalized by Tenure-Track + Research Faculty + Postdoctorates
CRA Taulbee Survey 2015



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 2015, further categorized as

teaching assistants (TAs), research assistants (RAs), and full-support fellows. The table also shows the split between those on institutional vs. external funds. The average number of TAs on institutional funds in U.S. CS departments increased 31.8 percent this year. Public universities reported a 17.9 percent

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

Department Type	# Dept	On Institutional Funds						On External Funds						Total
		Teaching Assistants		Research Assistants		Full-Support Fellows		Teaching Assistants		Research Assistants		Full-Support Fellows		
US CS Public	89	3,179.3	40.2%	1,117.5	14.1%	329.5	4.2%	3.3	0.0%	3,075.2	38.9%	206.0	2.6%	7,910.7
US CS Private	31	1,094.3	24.8%	1,140.1	25.8%	236.3	5.4%	15.0	0.3%	1,767.0	40.0%	161.3	3.7%	4,413.9
US CS Total	120	4,273.5	34.7%	2,257.6	18.3%	565.8	4.6%	18.3	0.1%	4,842.2	39.3%	367.3	3.0%	12,324.6
US CE	4	150.0	38.2%	38.0	9.7%	12.0	3.1%	0.0	0.0%	193.0	49.1%	0.0	0.0%	393.0
US I	10	196.5	42.0%	68.0	14.5%	28.5	6.1%	5.0	1.1%	163.0	34.9%	6.5	1.4%	467.5
Canadian	9	323.5	37.7%	92.5	10.8%	51.0	6.0%	40.0	4.7%	326.0	38.0%	24.0	2.8%	857.0
Grand Total	143	4,943.5	35.2%	2,456.1	17.5%	657.3	4.7%	63.3	0.5%	5,524.2	39.3%	397.8	2.8%	14,042.1

Table G2. Fall 2015 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	91	\$13,500	\$15,321	\$17,680	\$19,279	\$23,000
US CS Private	21	\$17,100	\$20,500	\$22,950	\$24,700	\$27,600
US CE	6		\$15,984	\$18,450	\$19,185	
US Info	10	\$17,178	\$19,316	\$20,636	\$22,597	\$24,762
Canadian	9		\$5,600	\$12,639	\$17,267	
Research Assistantships						
Department Type	# Depts	Percentiles of Department Averages				
		10th	25th	50th	75th	90th
US CS Public	90	\$14,501	\$16,650	\$18,122	\$20,000	\$23,449
US CS Private	29	\$19,180	\$22,000	\$24,300	\$26,450	\$29,866
US CE	6		\$17,317	\$18,084	\$18,800	
US Information	10	\$19,224	\$19,755	\$21,286	\$23,861	\$25,000
Canadian	8		\$9,569	\$12,320	\$15,750	
Full-Support Fellows						
Department Type	# Depts	Percentiles of Department Averages				
		10th	25th	50th	75th	90th
US CS Public	58	\$16,840	\$18,498	\$22,000	\$25,000	\$33,200
US CS Private	27	\$20,600	\$22,423	\$24,700	\$28,955	\$31,700
US CE	5			\$18,000		
US Information	4			\$25,125		
Canadian	4			\$18,000		

increase, while the average at private universities more than doubled. In last year's report, private universities reported over a 14.2 percent decrease. It is possible that there were some inconsistencies between years in departmental reporting. The average number of TAs at I departments rose 15.2 percent and the average at Canadian departments rose 64.9 percent. The small number of I and Canadian departments make these comparative averages subject to volatility. However, it seems safe to say that all types of departments increased their average number of TAs this year. This is consistent with the undergraduate enrollment increases reported earlier.

Following a year of significant decline at both public and private universities in the average number of RAs on institutional funding, this average more than doubled this year at U.S. public universities, and nearly tripled at U.S. private universities. The number of RAs on external funding decreased by 14.6 percent in U.S. CS departments at public universities, but increased by 39.7 percent in departments at private universities. For the second year in a row, we see both public and private institutions experiencing just the reverse of what was experienced in the previous year's report. The average number of full-support fellows on both internal and external funds declined in U.S. CS departments at both public and private universities.

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. Figures G1-G3 further break down the U.S. CS data by size of department and by geographic location of the university.

The median TA salaries at U.S. CS departments increased 1.2 percent at public universities and increased 2.6 percent at private universities. Median salaries of RAs were essentially unchanged at public universities but rose 5.9 percent at private universities. For full support fellows, median salaries rose 4.1 percent at U.S. public universities but declined 13.9 percent at U.S. private universities. Last year, we reported a large increase in the median salary of full support fellows at private universities, so there may be an error in the data provided to us in one of the years. Through further analysis, we also observed that those departments from private institutions that reported in this year's survey but not last year's typically had lower than average stipends.

Larger departments at U.S. public universities tend to offer higher stipends to both TAs and RAs than do smaller departments, and private universities tend to offer higher stipends to all categories of grad students than do public universities. As was the case last year, departments located in larger population centers also tend to pay higher stipends to TAs; the effect of locale on RA stipends was less clear this year for both publics and privates, and the data for full-support fellows exhibits no clear trend relative to locale at public universities.

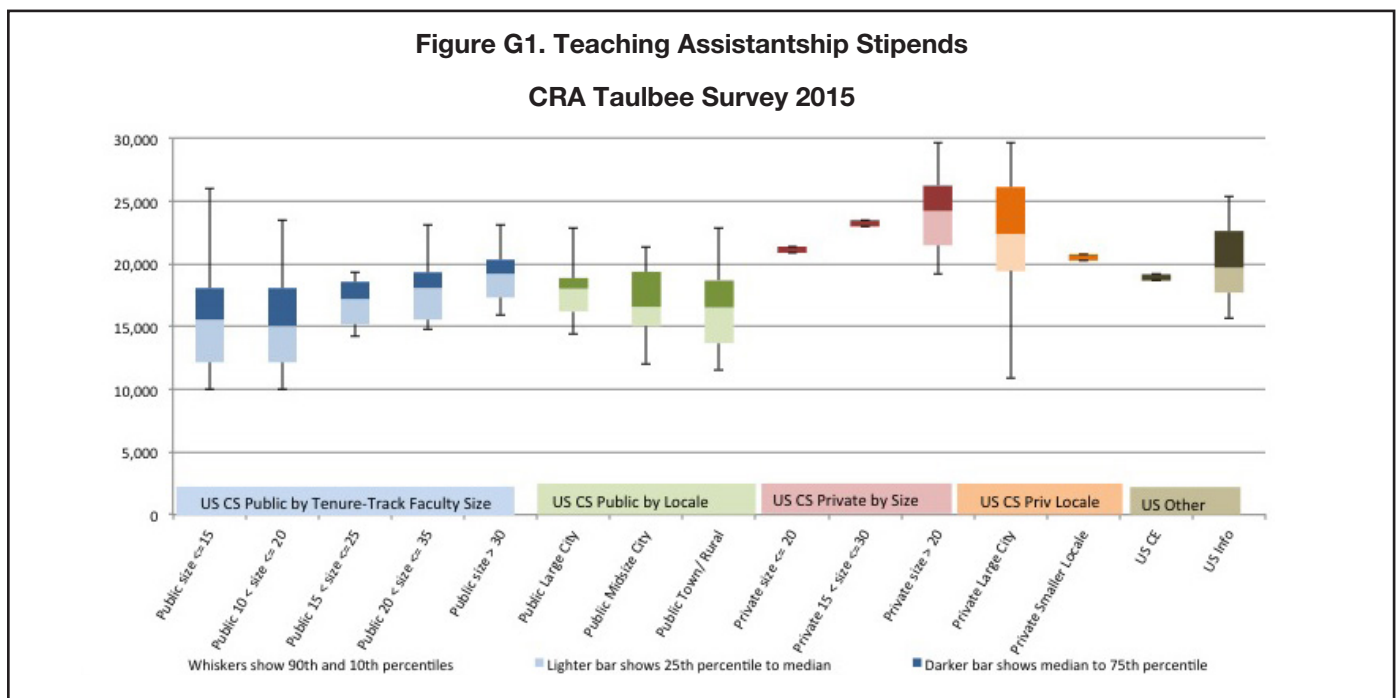


Figure G2. Research Assistantship Stipends
CRA Taulbee Survey 2015

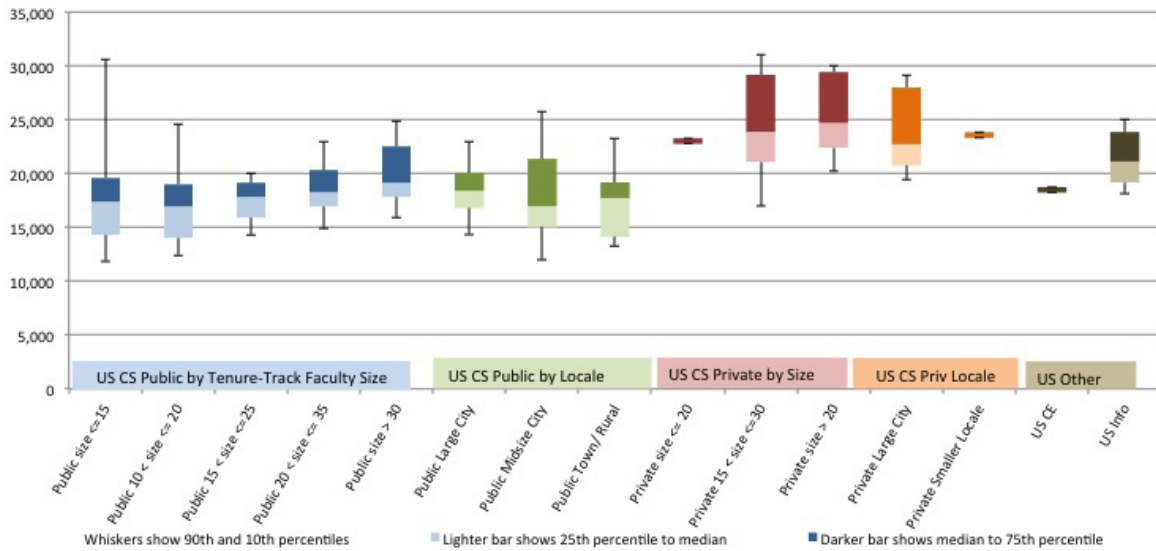
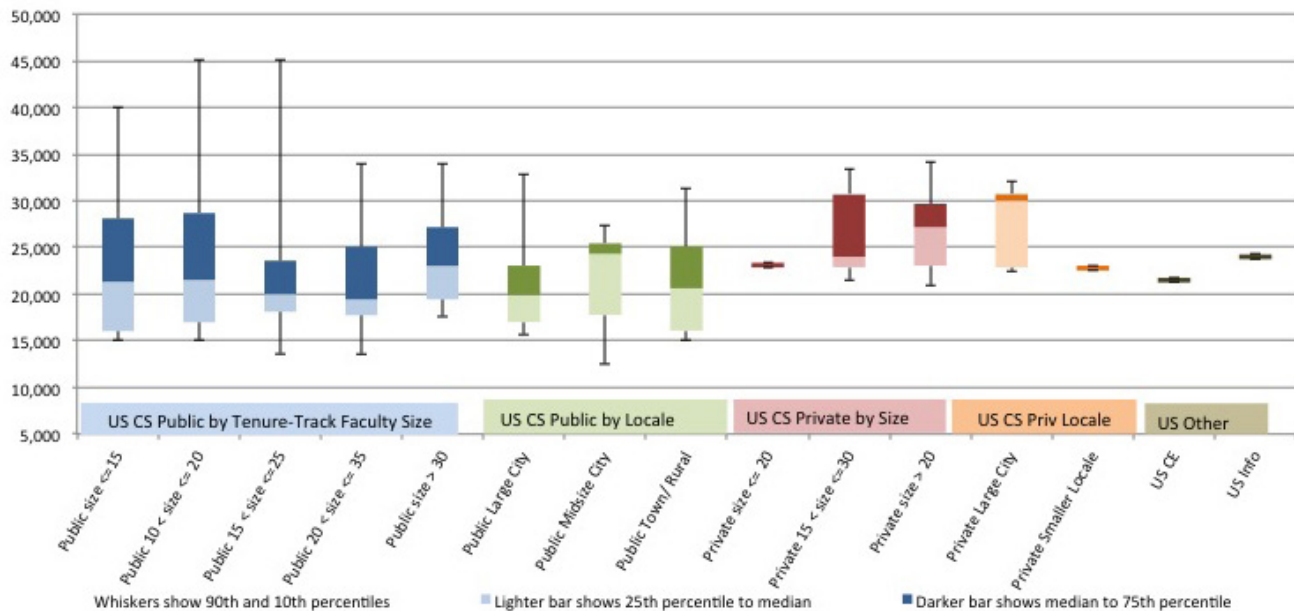


Figure G3. Full Support Fellows Stipends
CRA Taulbee Survey 2015



Faculty Salaries (Tables SI-S21; Figures SI-S9)

Each department was asked to report individual (but anonymous) faculty salaries if possible; otherwise, the department was requested to provide the mean salary for each rank (full, associate, and assistant professors and non-tenure-track teaching faculty, research faculty, and post-doctorates) and the number of persons at each rank. The salaries are those in effect on January 1, 2016. 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 in Tables SI-S16 and in the box and whiskers diagrams. Data for CE, I, Canadian and new Ph.D.s are reported in Tables SI7-S20. 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

Table S1. Nine-month Salaries, 132 Responses of 190 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 yrs	All years in rank	In rank 8+ years	In rank 0-7 yrs	All years in rank		Teach	Research	Postdoc
Depts	101	108	111	128	98	113	125	128	88	47	44
Indiv	552	547	633	1,812	401	603	1,064	792	627	262	353
10	\$127,800	\$123,346	\$115,893	\$127,969	\$97,666	\$98,365	\$99,173	\$88,788	\$63,823	\$58,466	\$40,887
25	\$139,693	\$139,661	\$127,784	\$137,653	\$102,059	\$105,432	\$105,682	\$93,277	\$68,482	\$73,694	\$47,563
50	\$165,667	\$158,109	\$141,273	\$156,016	\$110,180	\$113,873	\$111,670	\$99,115	\$75,712	\$85,900	\$54,155
75	\$182,708	\$174,541	\$157,496	\$168,839	\$120,141	\$120,933	\$121,010	\$104,754	\$88,976	\$117,996	\$60,764
90	\$200,281	\$195,062	\$184,685	\$186,073	\$128,277	\$130,188	\$130,058	\$111,231	\$103,485	\$145,329	\$67,908

Table S2. Nine-month Salaries, 97 Responses of 137 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 yrs	All years in rank	In rank 8+ years	In rank 0-7 yrs	All years in rank		Teach	Research	Postdoc
Depts	78	84	86	95	78	89	93	94	62	34	32
Indiv	401	418	465	1,319	308	478	810	559	394	179	208
10	\$127,613	\$120,324	\$114,731	\$123,307	\$97,610	\$97,372	\$98,327	\$87,745	\$60,400	\$57,891	\$40,299
25	\$137,670	\$138,816	\$124,300	\$134,450	\$101,876	\$103,687	\$104,132	\$91,954	\$66,553	\$70,892	\$48,195
50	\$156,408	\$151,552	\$140,072	\$152,687	\$109,037	\$112,446	\$110,450	\$97,599	\$72,949	\$79,852	\$53,619
75	\$176,766	\$171,136	\$153,002	\$163,135	\$117,731	\$119,834	\$117,898	\$102,351	\$79,653	\$102,788	\$57,828
90	\$189,531	\$183,944	\$171,781	\$170,844	\$126,448	\$125,831	\$128,270	\$105,981	\$90,444	\$119,000	\$62,520

Table S3. Nine-month Salaries, 34 Responses of 53 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 yrs	All years in rank	In rank 8+ years	In rank 0-7 yrs	All years in rank		Teach	Research	Postdoc
Depts	23	24	25	33	20	24	32	34	26	13	12
Indiv	151	129	168	493	93	125	254	233	233	83	145
10	\$134,248	\$132,601	\$127,788	\$130,980	\$101,060	\$106,347	\$103,922	\$95,740	\$73,356	\$63,857	\$42,977
25	\$170,595	\$148,611	\$138,375	\$144,992	\$106,068	\$112,244	\$110,979	\$98,504	\$78,930	\$84,027	\$45,746
50	\$183,615	\$176,810	\$160,098	\$176,399	\$115,907	\$119,881	\$119,338	\$106,250	\$89,816	\$127,260	\$59,095
75	\$204,272	\$197,763	\$187,065	\$196,001	\$126,712	\$130,880	\$129,841	\$111,785	\$100,809	\$144,008	\$67,769
90	\$225,246	\$220,428	\$197,740	\$212,554	\$132,831	\$142,207	\$140,785	\$120,443	\$111,360	\$153,189	\$68,289

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.

We also report salary data for senior faculty based on time in rank, for more 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.

Those departments reporting salary data were provided a summary report in December 2015. Those departments that provided individual salaries were additionally provided more comprehensive distributional information based on these

Table S4. Nine-month Salaries, 26 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	13	15	19	24	16	20	23	23	9	2	1
Indiv	34	28	46	117	48	65	127	68	32		
10	\$108,250	\$108,843	\$111,958	\$109,239	\$98,432	\$94,551	\$97,580	\$84,614			
25	\$127,800	\$119,026	\$117,356	\$124,349	\$101,462	\$99,661	\$101,061	\$87,429	\$59,250		
50	\$135,605	\$142,258	\$125,000	\$133,036	\$106,447	\$103,883	\$104,132	\$92,000	\$68,111		
75	\$153,351	\$150,076	\$133,277	\$146,318	\$120,090	\$114,540	\$110,989	\$96,000	\$72,897		
90	\$156,892	\$166,403	\$144,174	\$155,169	\$130,299	\$120,857	\$122,635	\$102,067			

Table S5. Nine-month Salaries, 29 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	18	20	22	28	22	25	28	28	14	2	3
Indiv	52	64	61	197	64	91	170	84	41		
10	\$113,805	\$117,749	\$114,437	\$118,603	\$96,531	\$95,094	\$97,031	\$84,983	\$58,271		
25	\$130,030	\$120,809	\$116,990	\$129,233	\$98,721	\$98,645	\$99,636	\$89,865	\$64,067		
50	\$138,695	\$137,726	\$126,787	\$136,255	\$102,479	\$103,687	\$104,015	\$92,103	\$66,766		
75	\$152,642	\$150,218	\$141,247	\$149,002	\$109,209	\$114,343	\$108,871	\$96,370	\$71,441		
90	\$168,639	\$160,163	\$155,475	\$156,364	\$118,881	\$119,052	\$121,630	\$102,646	\$74,242		

Table S6. Nine-month Salaries, 26 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	21	24	24	26	22	24	25	26	18	8	7
Indiv	72	94	103	280	59	95	162	95	65	21	18
10	\$113,879	\$121,511	\$113,579	\$123,116	\$92,758	\$95,773	\$96,815	\$87,723	\$63,055		
25	\$134,062	\$130,580	\$117,585	\$131,492	\$98,181	\$100,357	\$103,630	\$90,325	\$64,910	\$65,520	\$40,000
50	\$139,693	\$147,626	\$131,414	\$144,290	\$102,994	\$109,654	\$108,198	\$94,968	\$68,263	\$78,358	\$44,592
75	\$166,663	\$162,208	\$151,308	\$156,578	\$111,157	\$114,328	\$111,368	\$101,050	\$74,134	\$86,848	\$50,991
90	\$187,038	\$173,539	\$160,131	\$166,602	\$113,498	\$117,740	\$115,449	\$105,129	\$77,673		

individual salaries. This year, 75 percent of those reporting salary data provided salaries at the individual level.

The remainder of this section updates the basic report provided in December to all departments that provided salary data. It reflects salary data received since the deadline for that report.

Salaries at private institutions tend to be higher than those at public institutions for all faculty types (Tables S2 and S3). This pattern is consistent with observations in previous years.

Viewed relative to faculty size, salaries at each rank tend to be higher for larger departments at both public (Tables S4-S8) and private (Tables S9-S11) institutions. At public institutions, this

Table S7. Nine-month Salaries, 29 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	28	29	27	29	26	28	28	29	20	14	10
Indiv	122	130	123	380	97	123	220	154	105	41	54
10	\$128,526	\$125,310	\$117,335	\$131,066	\$98,694	\$99,059	\$102,295	\$88,754	\$63,192	\$49,656	\$39,499
25	\$136,063	\$138,963	\$131,414	\$143,686	\$103,235	\$106,733	\$106,492	\$92,916	\$66,127	\$69,800	\$45,414
50	\$151,436	\$154,458	\$146,973	\$155,313	\$110,778	\$112,468	\$110,459	\$98,901	\$71,504	\$78,358	\$49,979
75	\$175,692	\$172,257	\$159,210	\$163,278	\$115,342	\$116,782	\$112,863	\$101,275	\$78,491	\$90,344	\$56,517
90	\$180,818	\$185,587	\$179,389	\$174,172	\$121,077	\$122,594	\$121,250	\$105,249	\$86,872	\$113,546	\$58,046

Table S8. Nine-month Salaries, 33 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	32	33	32	33	28	33	33	33	28	20	21
Indiv	235	245	279	774	144	259	405	308	260	139	174
10	\$142,059	\$142,346	\$128,176	\$145,501	\$101,598	\$107,311	\$107,455	\$95,789	\$62,722	\$66,617	\$46,299
25	\$153,427	\$150,878	\$134,231	\$155,232	\$106,838	\$112,270	\$111,548	\$98,749	\$70,165	\$74,290	\$50,750
50	\$169,128	\$168,686	\$147,445	\$159,459	\$111,501	\$119,070	\$115,427	\$101,275	\$77,691	\$90,082	\$53,871
75	\$180,641	\$174,983	\$155,873	\$167,028	\$121,737	\$123,002	\$125,969	\$104,102	\$87,538	\$106,930	\$58,510
90	\$199,053	\$188,554	\$164,478	\$179,040	\$131,046	\$130,188	\$130,182	\$107,451	\$105,923	\$128,138	\$66,333

Table S9. Nine-month Salaries, 15 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	7	8	9	14	8	9	14	15	11	5	4
Indiv	30	28	32	103	17	26	59	59	40	9	20
10				\$128,860			\$102,083	\$95,491	\$70,792		
25	\$145,034	\$133,070	\$128,203	\$136,246	\$104,441	\$112,149	\$111,305	\$99,849	\$74,935		
50	\$171,918	\$170,798	\$153,733	\$169,218	\$112,124	\$118,828	\$117,265	\$104,099	\$79,977	\$127,260	\$54,844
75	\$178,142	\$201,411	\$186,000	\$195,006	\$126,000	\$129,274	\$128,410	\$110,909	\$94,960		
90				\$214,671			\$137,202	\$116,595	\$102,315		

Table S10. Nine-month Salaries, 15 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	10	12	12	15	8	10	14	15	10	5	6
Indiv	41	57	53	175	22	34	65	80	53	15	43
10	\$170,725	\$136,154	\$129,992	\$144,694		\$110,111	\$107,575	\$97,885	\$74,614		
25	\$176,896	\$148,611	\$138,449	\$160,780	\$102,914	\$112,826	\$110,825	\$98,804	\$82,766		
50	\$185,258	\$174,443	\$169,165	\$173,062	\$112,124	\$119,101	\$116,245	\$104,156	\$92,547	\$84,027	\$50,523
75	\$197,301	\$194,918	\$190,024	\$185,675	\$119,424	\$128,993	\$126,345	\$109,165	\$101,820		
90	\$226,239	\$212,690	\$211,587	\$207,006		\$134,050	\$129,283	\$116,595	\$118,988		

Table S11. Nine-month Salaries, 19 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	16	16	16	19	12	15	18	19	15	8	8
Indiv	121	101	136	390	76	99	195	174	193	74	125
10	\$160,103	\$141,437	\$132,928	\$138,017	\$103,431	\$106,222	\$108,624	\$96,324	\$77,114		
25	\$183,336	\$158,902	\$144,971	\$163,550	\$110,798	\$113,376	\$111,493	\$98,182	\$85,646	\$99,048	\$45,746
50	\$198,718	\$176,810	\$165,655	\$177,857	\$119,130	\$120,933	\$122,657	\$108,270	\$93,486	\$124,970	\$65,316
75	\$218,484	\$193,921	\$187,496	\$194,751	\$128,083	\$134,907	\$133,728	\$114,676	\$102,066	\$144,834	\$68,080
90	\$227,064	\$213,709	\$193,554	\$205,965	\$132,981	\$142,009	\$140,875	\$122,223	\$112,131		

Table S12. Nine-month Salaries, 37 Responses of US CS Public In Large City or Suburbs, 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	31	32	35	36	29	36	36	36	24	16	12
Indiv	159	160	206	535	129	211	342	248	187	110	99
10	\$134,062	\$137,652	\$115,749	\$130,626	\$95,949	\$101,456	\$102,034	\$91,690	\$64,042	\$63,863	\$40,299
25	\$142,055	\$142,877	\$126,061	\$138,984	\$102,209	\$107,302	\$107,083	\$95,521	\$68,106	\$73,868	\$48,118
50	\$163,506	\$152,668	\$134,118	\$155,272	\$111,404	\$113,677	\$111,924	\$100,349	\$72,337	\$99,612	\$52,381
75	\$176,641	\$170,057	\$150,108	\$161,221	\$120,321	\$119,335	\$118,191	\$102,810	\$81,040	\$117,539	\$56,333
90	\$198,863	\$184,096	\$156,387	\$169,206	\$129,906	\$127,069	\$128,534	\$106,287	\$90,361	\$141,344	\$58,361

Table S13. Nine-month Salaries, 23 Responses of US CS Public in Midsize City or Suburbs, 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	18	20	18	21	19	20	21	21	12	5	6
Indiv	107	114	130	362	57	99	166	122	79	12	25
10	\$121,411	\$120,148	\$118,852	\$130,087	\$95,736	\$97,078	\$97,482	\$88,196	\$65,430		
25	\$137,661	\$144,544	\$129,063	\$145,133	\$99,975	\$108,448	\$108,198	\$92,203	\$67,360		
50	\$153,868	\$158,368	\$146,233	\$153,878	\$106,524	\$114,737	\$112,241	\$98,906	\$70,801	\$77,400	\$52,862
75	\$181,186	\$172,303	\$152,459	\$166,353	\$115,251	\$121,045	\$120,016	\$104,712	\$78,906		
90	\$192,830	\$176,415	\$158,338	\$168,700	\$121,653	\$130,593	\$130,350	\$113,970	\$104,311		

Table S14. Nine-month Salaries, 36 Responses of US CS Public in Small City, Town, or Rural, 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	26	29	31	35	27	30	33	34	24	12	14
Indiv	117	135	126	392	109	161	282	176	120	55	84
10	\$120,840	\$119,382	\$115,098	\$118,397	\$98,269	\$97,168	\$98,327	\$87,380	\$57,688	\$50,122	\$46,774
25	\$132,372	\$130,450	\$120,745	\$130,626	\$101,734	\$100,820	\$102,327	\$90,284	\$64,537	\$69,412	\$49,139
50	\$155,799	\$149,000	\$140,392	\$145,458	\$105,597	\$105,515	\$105,682	\$94,081	\$73,477	\$78,358	\$54,345
75	\$173,939	\$170,871	\$157,528	\$162,012	\$117,468	\$116,745	\$110,468	\$99,544	\$78,556	\$87,381	\$58,298
90	\$180,426	\$186,292	\$174,592	\$175,541	\$124,680	\$121,852	\$121,024	\$104,131	\$86,632	\$94,878	\$62,418

Table S15. Nine-month Salaries, 23 Responses of US CS Private in Large City or Suburbs, 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	16	16	17	23	14	16	21	23	18	10	8
Indiv	97	84	128	341	82	95	203	176	188	69	98
10	\$127,740	\$131,859	\$128,441	\$130,980	\$103,510	\$104,876	\$103,634	\$95,624	\$71,517	\$77,100	
25	\$157,728	\$133,725	\$138,375	\$144,744	\$107,846	\$109,420	\$111,007	\$98,553	\$78,930	\$91,155	\$43,112
50	\$186,531	\$158,479	\$156,680	\$169,815	\$118,249	\$119,542	\$119,847	\$104,156	\$86,138	\$129,426	\$59,095
75	\$200,105	\$194,918	\$188,788	\$193,309	\$126,269	\$129,956	\$129,620	\$114,676	\$99,097	\$142,356	\$65,673
90	\$214,539	\$213,709	\$197,160	\$212,651	\$127,822	\$140,065	\$140,451	\$121,783	\$104,465	\$149,269	

Table S16. Nine-month Salaries, 11 Responses of US CS Private in Other than Large City, 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	7	8	8	10	6	8	11	11	8	3	4
Indiv	54	45	40	152	11	30	51	57	45	0	47
10				\$137,109			\$110,763	\$98,160			
25	\$182,089	\$172,562	\$154,957	\$176,763		\$117,904	\$113,252	\$100,860	\$87,307		
50	\$183,615	\$188,938	\$167,997	\$184,168	\$115,070	\$119,881	\$118,828	\$106,300	\$95,192		\$61,380
75	\$221,656	\$203,481	\$186,266	\$197,025		\$135,130	\$127,444	\$109,035	\$104,583		
90				\$205,464			\$141,000	\$115,339			

Table S17. Nine-month Salaries, 7 Responses of 32 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	4	5	5	7	4	5	7	6	4	2	1
Indiv	11	13	19	65	7	24	44	19	11		
10											
25				\$126,102			\$99,212				
50	\$154,343	\$128,200	\$124,550	\$138,820	\$100,334	\$109,836	\$106,119	\$97,139	\$78,085		
75				\$180,557			\$116,869				
90											

Table S18. Nine-month Salaries, 12 Responses of 20 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	9	11	12	13	11	13	13	13	9	5	3
Indiv	33	43	73	149	63	83	147	109	108	22	
10		\$130,924	\$119,152	\$123,471	\$102,066	\$93,343	\$98,499	\$83,529			
25	\$136,961	\$134,407	\$130,409	\$137,063	\$108,988	\$109,006	\$108,333	\$88,883	\$67,568		
50	\$159,849	\$145,229	\$148,620	\$155,804	\$115,226	\$115,157	\$116,619	\$97,146	\$88,746	\$93,708	
75	\$169,272	\$178,095	\$158,765	\$166,046	\$121,109	\$119,975	\$121,548	\$101,815	\$95,479		
90		\$182,795	\$194,153	\$181,710	\$146,550	\$129,716	\$132,923	\$105,429			

Table S19. Twelve-month Salaries, 10 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	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	10	9	9	10	10	9	10	10	8	4	6
Indiv	51	58	68	177	70	42	112	46	65	13	58
10	\$158,083			\$146,713	\$125,676		\$123,851	\$93,381			
25	\$164,468	\$158,978	\$135,954	\$151,230	\$133,740	\$116,066	\$125,697	\$98,736	\$98,125		
50	\$188,500	\$174,726	\$158,521	\$176,500	\$141,218	\$125,060	\$137,983	\$110,608	\$110,268	\$79,525	\$48,350
75	\$208,988	\$188,692	\$182,037	\$190,438	\$152,522	\$144,913	\$148,666	\$120,402	\$118,480		
90	\$224,519			\$192,707	\$166,386		\$163,029	\$124,987			

Table S20. Nine-month Salaries for New PhDs (Twelve-month for Canadians)

	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	63	21	7	24	5	1	0	1
Indiv	117	27	14	80	11			
10	\$89,750	\$63,184		\$42,450				
25	\$94,750	\$67,500	\$64,579	\$46,818				
50	\$98,500	\$80,000	\$64,579	\$54,410	\$95,250			
75	\$104,875	\$87,250	\$68,750	\$67,692				
90	\$111,667	\$94,340		\$68,000				

Table S21. Change in Salary Median for Departments that Reported in Both 2014 and 2015

	U.S. CS	U.S. CE	U.S. I	Canadian
Departments	117	6	10	8
Full Profs	4.2%	9.4%	9.8%	0.2%
Assoc. Profs.	1.7%	6.2%	6.4%	1.7%
Asst. Profs.	3.8%	1.7%	1.7%	-1.2%
Non-ten-track teaching faculty	4.3%	-21.3%	11.1%	5.5%
Research faculty	-3.6%	-21.7%	38.6%	-2.9%
Post doctorates	2.4%		-5.7%	-5.8%

also is consistent with the pattern in previous years. At private institutions last year, senior faculty salaries at larger departments did not tend to be higher than those at smaller departments.

Viewed relative to type of locale, public institution salaries appear to be generally lower in smaller locales for assistant professors and early stage associate professors (Tables S12-S14), while private institution salaries exhibit no consistent pattern relative to type of locale (Tables S15-S16). These observations coincide with those in previous years.

When analyzing the magnitude of faculty salary changes from one year to the next, we use only those departments that reported both years; otherwise, the departments that reported during only one year can skew the comparison. Because some departments that reported both years provided only aggregate salaries for their full and associate professors during one year and in the other year reported them by years in rank, we only report salary changes for all full professors and for all associate professors in the year-to-year comparison. Table S21 shows, by type of faculty and type of department, the change in the median of the average salaries from departments that reported both years (the number of departments being compared is indicated in the first row of each column). Using the cell showing full professors at U.S. CS departments as an

example, the table indicates that the median of the 117 average salaries for full professors was 4.2 percent higher in 2015 than was the median of the average full professor salaries in 2014 from these same 117 departments.

When interpreting these changes, it is important to remember the effect that promotions have on the departmental data from one year to the next, since individual faculty members move from one rank to another. Thus, a department with a small number of faculty members in a particular rank can have its average salary in that rank change appreciably (in either direction) by a single promotion to or from that rank. Departures via resignation or retirement also impact these figures, particularly in the non-tenure-track categories. Because of the small number of Canadian and Computer Engineering departments reporting, the values in those columns are considerably more volatile.

For new Ph.D.s in tenure-track positions at U.S. computer science, computer engineering, and I-school departments (Table S20) the median of the averages was \$98,500, an increase of 3.5 percent vs. last year. This year there is a sufficient number of Canadian institutions to report the median of the averages, but in 2014 none were reported, so year-to-year comparisons cannot be made.

Figure S1. US CS Department Average Salary, Full Professor in Rank 16+ Years

CRA Taulbee Survey 2015

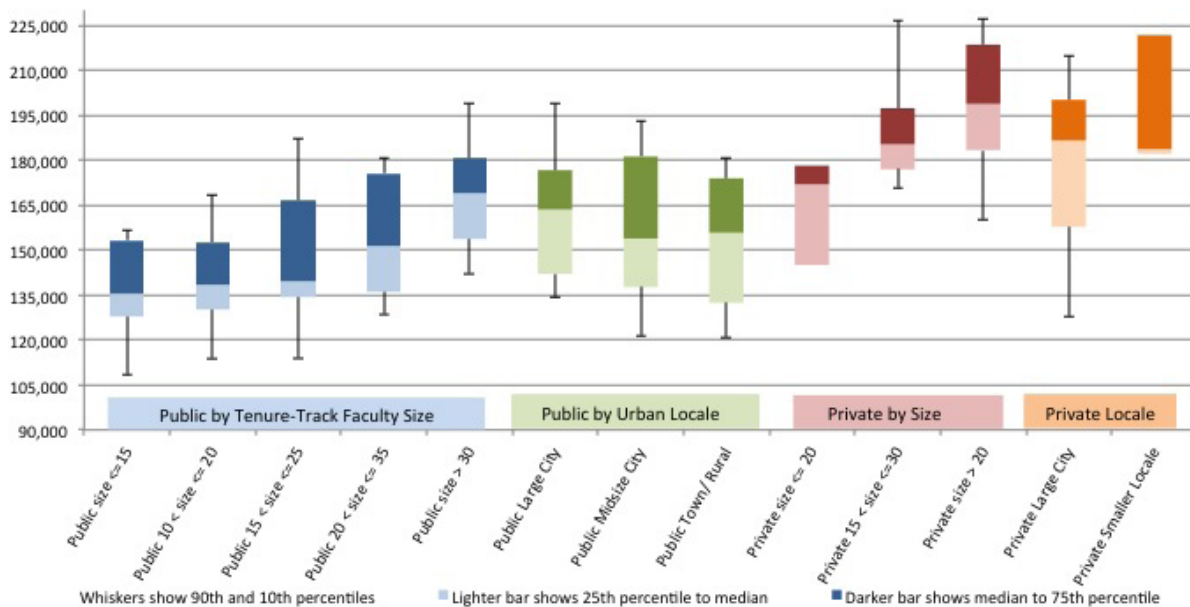


Figure S2. US CS Department Average Salary, Full Professor in Rank 8-15 Years

CRA Taulbee Survey 2015

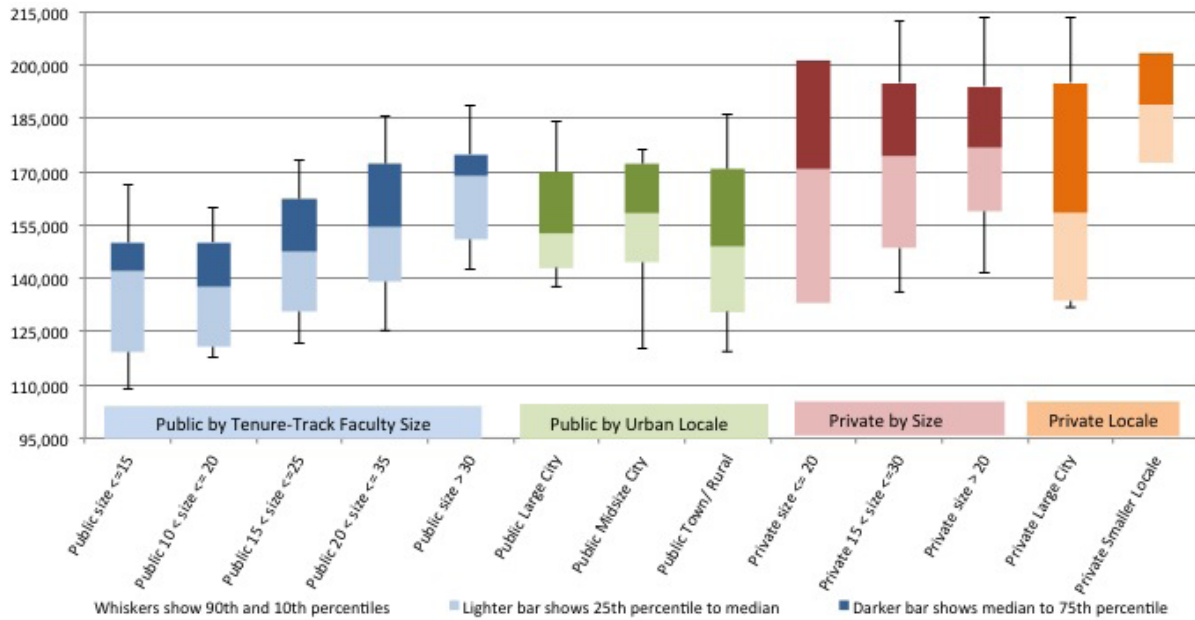


Figure S3. US CS Department Average Salary, Full Professor in Rank 0-7 Years

CRA Taulbee Survey 2015

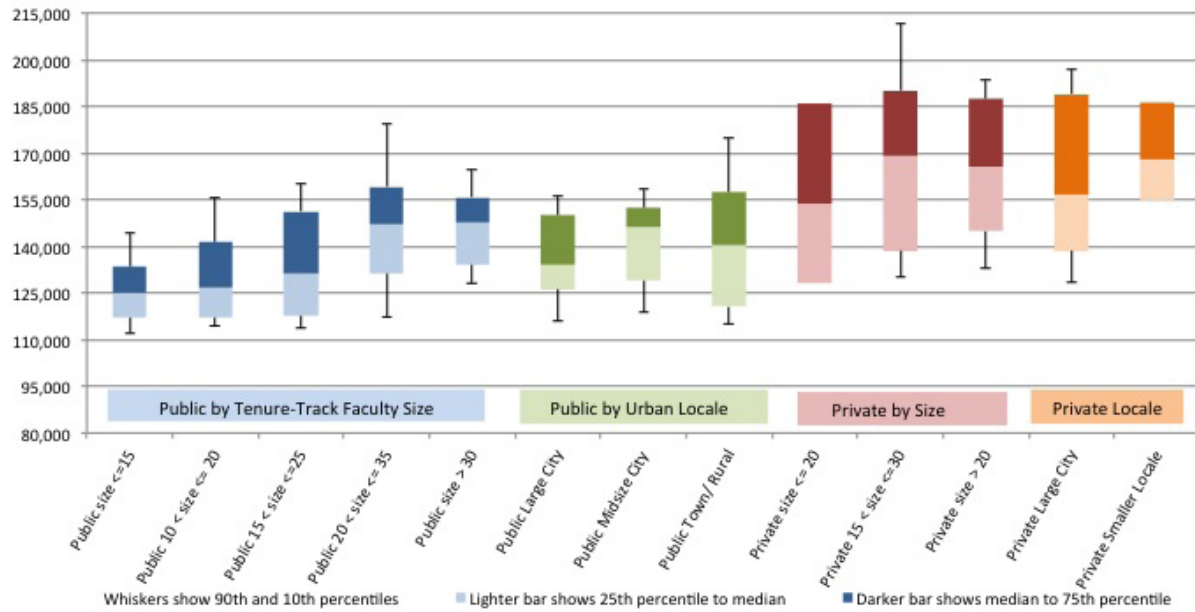


Figure S4. US CS Department Average Salary, Associate Professor in Rank 8+ Years

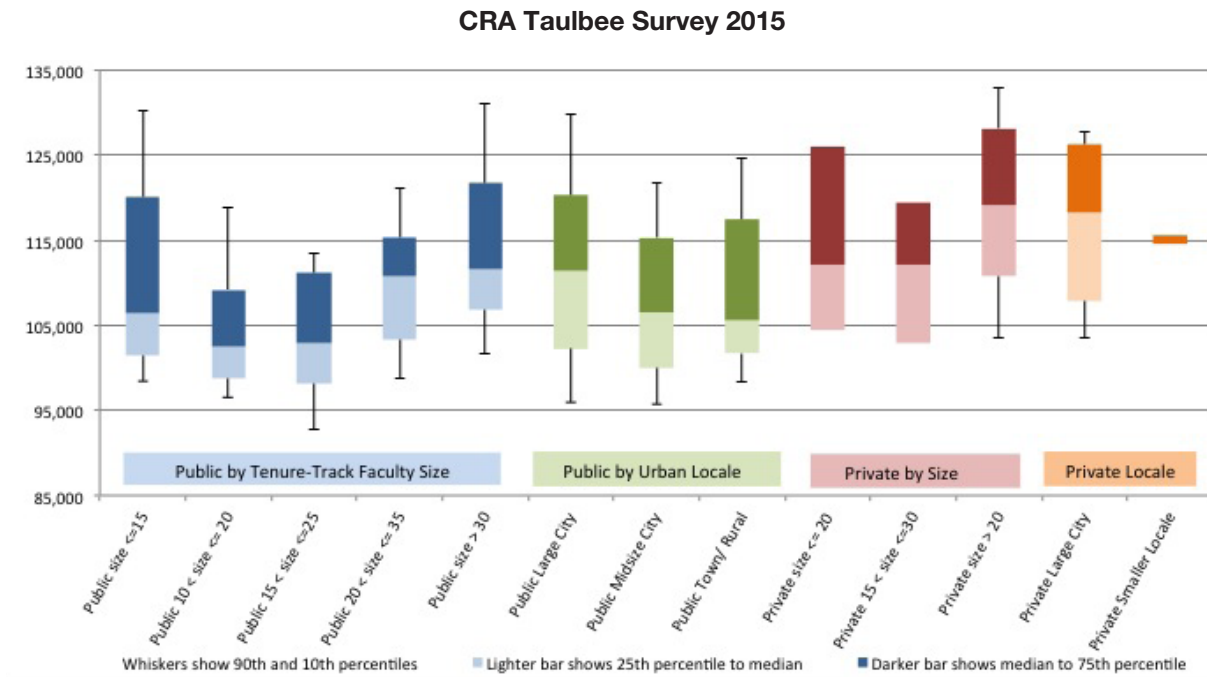


Figure S5. US CS Department Average Salary, Associate Professor in Rank 0-7 Years

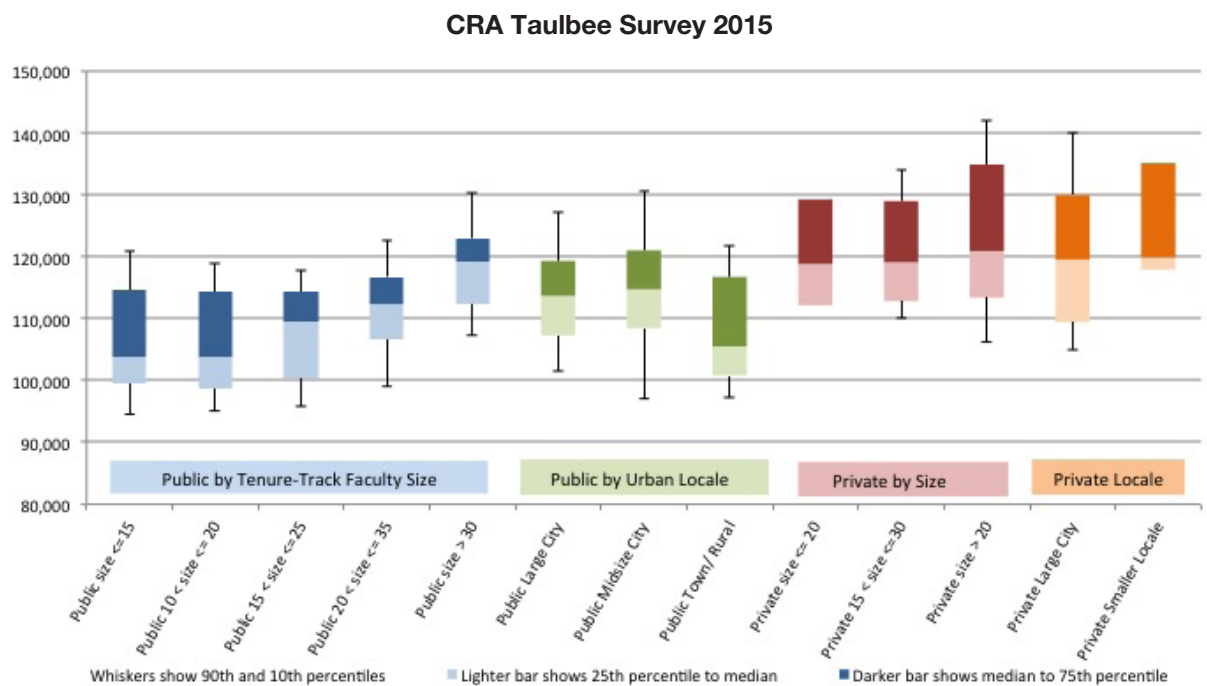


Figure S6. US CS Department Average Salary, Assistant Professor

CRA Taulbee Survey 2015

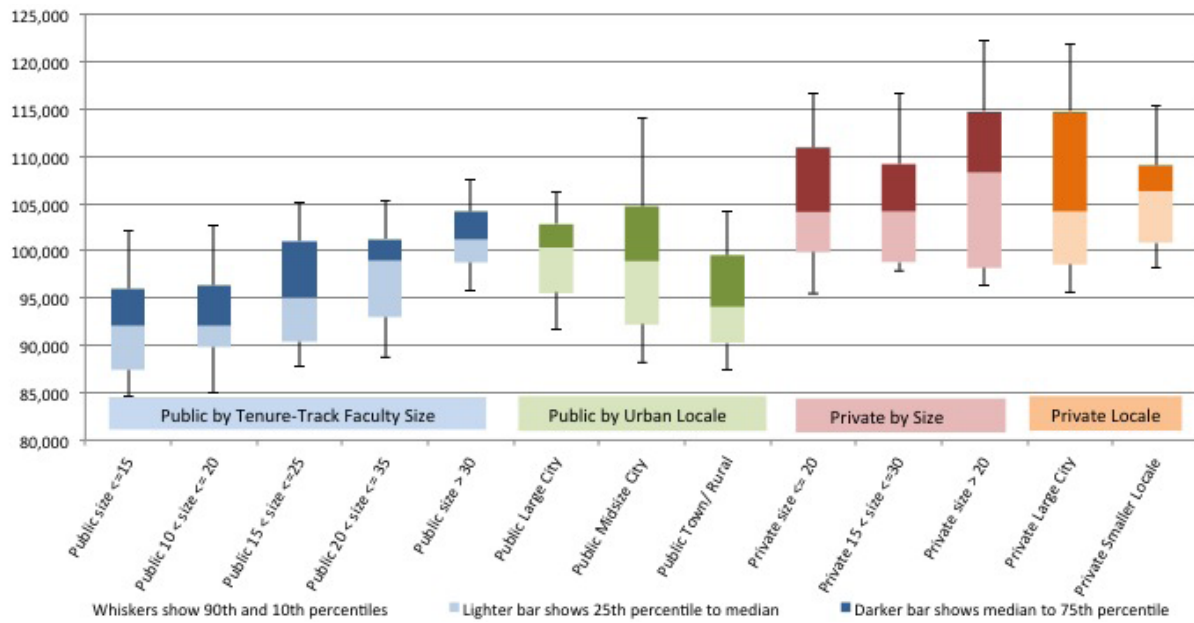


Figure S7. US CS Department Average Salary, Non-Tenure Track Teaching Faculty

CRA Taulbee Survey 2015

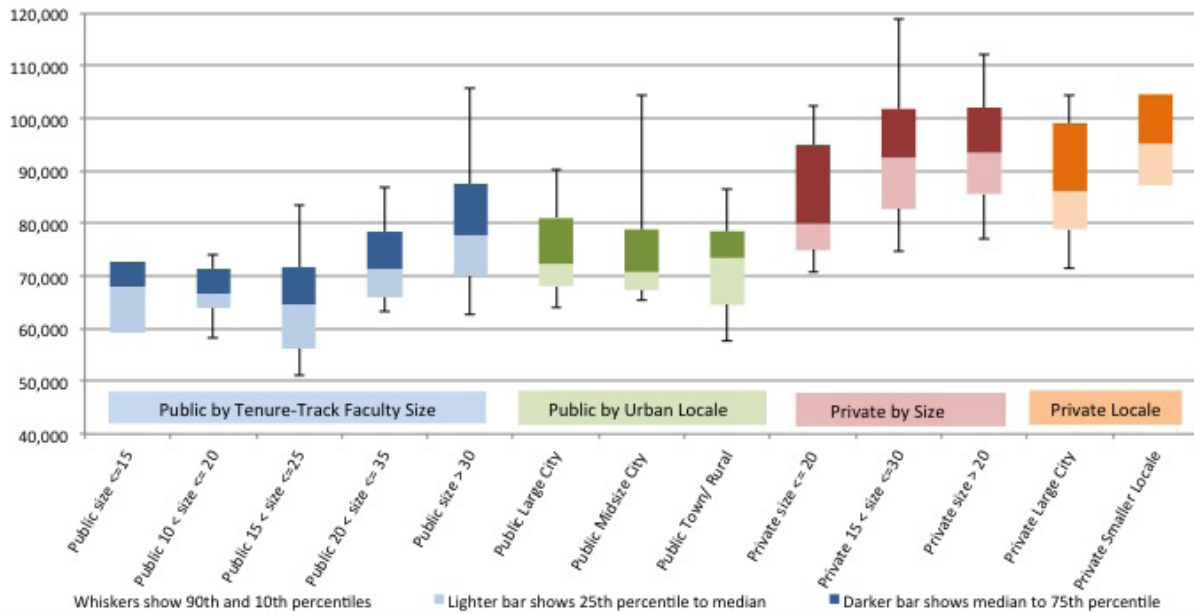


Figure S8. US CS Department Average Salary, Non-Tenure Track Research Faculty
CRA Taulbee Survey 2015

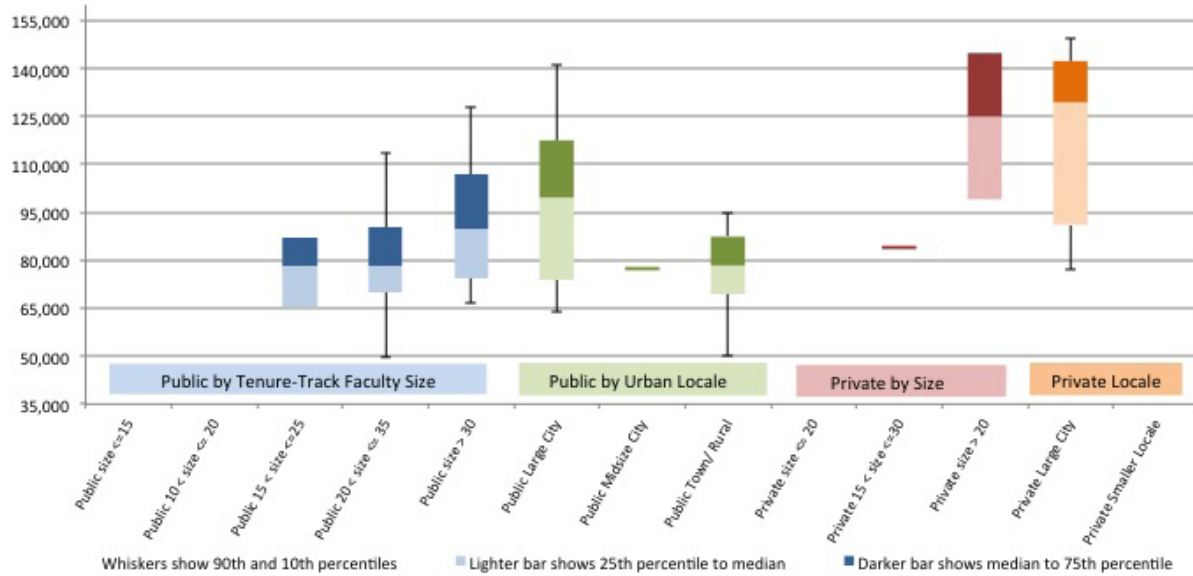
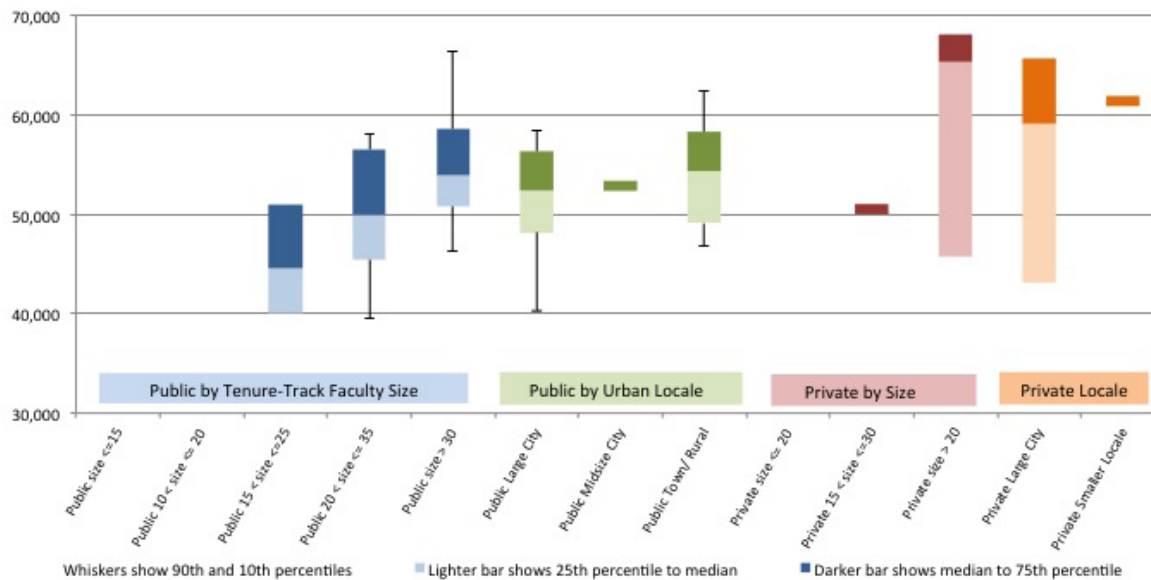


Figure S9. US CS Department Average Salary, Postdoctorates
CRA Taulbee Survey 2015



Department Profiles

Every three years, the Taulbee Survey collects data about elements of departmental activities that are not expected to change much from year to year. Included are data about teaching loads, sources of external funding, methods of recruiting graduate students, department support staff, and space. The most recent data about these activities were reported in the 2012 Taulbee Survey. The results of that survey are available on the CRA web site at http://cra.org/wp-content/uploads/2015/01/2012_taulbee_survey.pdf.

Teaching loads (Tables Prof1-Prof4)

Across all departments, the median teaching load in semester courses per year is 3.0, which has not changed over a long period of time. This median holds true in all departments except for U.S. CS private institutions where the median teaching load is 2.0, unchanged from last reporting. Three years ago, the medians at U.S. CE and U.S. I departments were 4.0 and 3.5, respectively. Note that the CE and I groups are small and thus more sensitive to the individual institutions reporting in a given year. (Table Prof1).

Table Prof2 shows whether or not it is possible to increase or decrease individual teaching loads from the standards, and Tables Prof 3 and Prof 4 indicate why such adjustments might be allowed. As has been the case in previous years, nearly every department allows reductions from the standard load, with little difference across department types. However, the reasons for reductions do vary across department types, with U.S. CS publics generally allowing more possible factors to reduce teaching load than do U.S. CS privates. Also as in previous years, about 2/3 of all departments allow increases, with a greater percentage of publics and Canadian departments allowing increases as compared with privates and U.S. I departments. A smaller percentage of departments (71 percent) allow increases for shifting primary responsibilities to teaching than did previously (76 percent three years ago and 81 percent six years ago), while a larger percent (29 percent) allow increases for other reasons than did previously (24 percent three years ago and 19 percent six years ago).

Table Prof1. Official Teaching Load of Tenured and Tenure-Track Faculty

Department Type	Official Teaching Load*					Academic Calendar			
	# Dept	Minimum	Mean	Median	Maximum	# Dept	Semester	Quarter	Other
US CS Public	97	2	3.2	3	9	100	90	10	0
US CS Private	32	1	2.7	2	6	34	27	7	0
US CE	7	2	3.3	3	4	7	6	1	0
US I	10	2	3.2	3	4	11	9	2	0
Canadian	8	3	3.4	3	4	10	8	0	2
Grand Total	154	1	3.1	3	9	162	140	20	2

* Teaching load is given for a semester calendar. Loads for a quarter system were multiplied by 2/3. To convert back to quarter-system equivalent, multiply these values by 1.5.

Table Prof2. Faculty Load Reductions and Increases

Department Type	Faculty Load Reduction Possible			Faculty Load Increase Possible		
	# Dept	Yes	No	# Dept	Yes	No
US CS Public	101	96.0%	4.0%	97	73.2%	26.8%
US CS Private	33	93.9%	6.1%	30	56.7%	43.3%
US CE	7	100.0%	0.0%	6	50.0%	50.0%
US I	11	90.9%	9.1%	11	54.5%	45.5%
Canadian	9	100.0%	0.0%	8	75.0%	25.0%
Grand Total	161	95.7%	4.3%	152	67.8%	32.2%

Table Prof3. Types of Load Reductions Possible in Departments Offering Reductions

Department Type	# Dept	Special Package for New Faculty	Administrative Duties	Type of Size of Class Taught	Buy-out % of salary	Buy-out fixed amt	Strong Research Involvement	Other
US CS Public	103	79.6%	84.5%	34.0%	68.9%	12.6%	56.3%	10.7%
US CS Private	38	73.7%	65.8%	18.4%	39.5%	0.0%	28.9%	21.1%
US CE	7	85.7%	85.7%	57.1%	85.7%	0.0%	71.4%	14.3%
US I	12	83.3%	75.0%	16.7%	50.0%	16.7%	33.3%	8.3%
Canadian	12	75.0%	75.0%	8.3%	0.0%	25.0%	58.3%	16.7%
Grand Total	172	78.5%	79.1%	28.5%	57.0%	10.5%	49.4%	13.4%

Table Prof4. Reasons for Increase in Teaching Load in Departments Where Increase is Possible

Department Type	# Dept	Shifting Primary Responsibilities to Teaching	Other
US CS Public	71	74.6%	25.4%
US CS Private	17	64.7%	35.3%
US CE	3	100.0%	0.0%
US I	6	50.0%	50.0%
Canadian	6	50.0%	50.0%
Grand Total	103	70.9%	29.1%

Sources of External Funding (Tables R2, R3)

Table R2 shows the distribution of sources of external research funding, and its historical values over the five three-year intervals during which we have collected such data. There is little difference in the distribution in 2015 compared with 2012. The average research support per department increased four

percent from 2012 to 2015, though this can be highly dependent on the particular departments responding; there are fewer departments that provided distributional information this year than did so in 2012. NSF continues to be the dominant funder of external research, followed by non-DARPA defense funding and industry funding.

Table R2. Comparison of US CS External Funding 2003-2015

	2003 (126 departments)		2006 (123 departments)		2009 (117 departments)	
	Total	% Fund	Total	% Fund	Total	% Fund
NSF	\$354,451,309	40.7	\$255,089,816	43.0	\$281,076,341	43.1
DARPA	\$85,401,891	9.8	\$64,191,150	10.8	\$38,393,018	5.9
NIH	\$15,864,767	1.8	\$24,880,112	4.2	\$33,128,578	5.1
DOE	\$20,471,676	2.4	\$24,391,329	4.1	\$17,225,839	2.6
State agencies	\$24,438,483	2.8	\$16,875,578	2.8	\$17,861,292	2.7
Industrial sources	\$70,813,388	8.1	\$50,333,039	8.5	\$76,464,763	11.7
Other defense	\$177,357,598	20.4	\$97,512,961	16.4	\$109,510,806	16.8
Other federal	\$50,555,980	5.8	\$32,388,664	5.5	\$27,695,790	4.2
Private foundation	\$32,977,093	3.8	\$10,826,656	1.8	\$18,297,020	2.8
IMLS						
Other	\$37,995,002	4.4	\$16,996,108	2.9	\$32,763,366	5.0
Total	\$870,327,187		\$593,485,413		\$652,416,813	
Average/Dept	\$6,907,359		\$4,825,085		\$5,576,212	
	2012 (123 departments)		2015 (108 departments)			
	Total	% Fund	Total	% Fund		
NSF	\$368,922,448	42.2	\$342,335,280	42.93		
DARPA	\$52,526,824	6.0	\$62,512,155	7.8		
NIH	\$46,533,387	5.3	\$35,716,475	4.5		
DOE	\$30,149,692	3.4	\$24,482,764	3.1		
State agencies	\$17,725,647	2.0	\$17,648,938	2.2		
Industrial sources	\$89,149,734	10.2	\$80,716,010	10.1		
Other defense	\$173,606,289	19.8	\$148,555,418	18.6		
Other federal	\$37,088,925	4.2	\$27,492,424	3.4		
Private foundation	\$23,600,989	2.7	\$33,488,855	4.2		
IMLS	\$288,059	0.0	\$79,692	0.0		
Other	\$35,190,510	4.0	\$24,440,153	3.1		
Total	\$874,782,504		\$797,468,164			
Average/Dept	\$7,112,053		\$7,383,964			

Table R3a. External Funding Breakdown of 82 US CS Public Departments

Funding Source	Sum	% of Fund	Percentile of Department Funding From Source				
			10th	25th	50th	75th	90th
NSF	\$242,966,494	47.8%	\$236,598	\$807,371	\$1,873,563	\$4,139,278	\$7,528,033
DARPA	\$27,941,514	5.5%	\$0	\$0	\$106,518	\$508,130	\$1,372,342
NIH	\$18,685,255	3.7%	\$0	\$44,699	\$153,330	\$492,836	\$935,804
DOE	\$15,131,029	3.0%	\$0	\$18,381	\$111,377	\$342,787	\$965,275
State agencies	\$16,540,810	3.3%	\$0	\$20,349	\$75,143	\$287,269	\$773,507
Industry	\$42,867,322	8.4%	\$1,027	\$31,477	\$235,546	\$700,971	\$1,850,347
Other defense	\$89,575,472	17.6%	\$14,926	\$152,992	\$490,387	\$1,495,659	\$4,164,485
Other federal	\$16,858,612	3.3%	\$0	\$36,214	\$179,238	\$485,921	\$788,443
Pvt foundation	\$18,149,309	3.6%	\$0	\$12,073	\$55,058	\$290,561	\$956,803
IMLS	\$79,692	0.0%	\$0	\$0	\$0	\$0	\$13,129
Other	\$19,223,071	3.8%	\$0	\$10,217	\$98,087	\$428,830	\$991,198
Total	\$508,018,580						

Table R3b. External Funding Breakdown of 26 US CS Private Departments

Funding Source	Sum	% of Fund	Percentile of Department Funding From Source				
			10th	25th	50th	75th	90th
NSF	\$99,368,786	34.3%	\$574,896	\$936,966	\$2,481,040	\$4,514,537	\$7,058,936
DARPA	\$34,570,641	11.9%	\$2,203	\$73,637	\$704,193	\$1,647,762	\$10,643,290
NIH	\$17,031,220	5.9%	\$2,693	\$101,774	\$365,100	\$819,699	\$4,493,789
DOE	\$9,351,735	3.2%	\$0	\$10,169	\$103,343	\$1,793,622	\$2,286,313
State agencies	\$1,108,128	0.4%			\$33,628		
Industry	\$37,848,688	13.1%	\$24,577	\$142,934	\$413,457	\$1,399,150	\$6,832,107
Other defense	\$58,979,946	20.4%	\$2,889	\$321,205	\$537,472	\$1,908,595	\$6,293,922
Other federal	\$10,633,812	3.7%	\$0	\$7,227	\$144,700	\$456,389	\$6,177,809
Pvt foundation	\$15,339,546	5.3%	\$0	\$22,033	\$204,153	\$733,146	\$4,861,686
IMLS		0.0%	\$0				
Other	\$5,217,082	1.8%	\$0	\$45,844	\$146,267	\$264,218	\$1,304,558
Total	\$289,449,584						

Table R3c. External Funding Breakdown of 4 US CE Departments

Funding Source	Sum	% of Fund	Percentile of Department Funding From Source				
			10th	25th	50th	75th	90th
NSF	\$5,058,107	46.9%			\$1,145,059		
DARPA	\$672,331	6.2%			\$58,887		
NIH	\$762,610	7.1%			\$155,391		
DOE	\$2,021,777	18.7%					
State agencies	\$56,866	0.5%					
Industry	\$1,278,417	11.8%			\$415,004		
Other defense	\$693,296	6.4%			\$169,981		
Other federal	\$175,710	1.6%					
Pvt foundation	\$17,051	0.2%					
IMLS	\$12,603	0.1%					
Other	\$39,833	0.4%					
Total	\$10,788,601						

Table R3d. External Funding Breakdown of 12 US Information Departments

Funding Source	Sum	% of Fund	Percentile of Department Funding From Source				
			10th	25th	50th	75th	90th
NSF	\$15,041,369	39.8%	\$184,066	\$592,400	\$1,105,755	\$1,894,628	\$2,880,258
DARPA	\$68,521	0.2%					
NIH	\$913,121	2.4%		\$2,868	\$101,604	\$287,340	
DOE	\$393,525	1.0%		\$0	\$14,371	\$189,577	
State agencies	\$435,770	1.2%		\$36,801	\$76,508	\$106,341	
Industry	\$1,847,473	4.9%		\$26,755	\$81,000	\$451,829	
Other defense	\$3,895,626	10.3%		\$9,471	\$130,720	\$1,076,657	
Other federal	\$2,673,460	7.1%		\$48,219	\$426,797	\$1,075,113	
Pvt foundation	\$6,921,585	18.3%	\$22,272	\$83,591	\$476,909	\$1,066,981	\$1,893,206
IMLS	\$3,632,378	9.6%		\$153,767	\$605,982	\$634,559	
Other	\$1,985,199	5.3%		\$77,603	\$195,914	\$263,428	
Total	\$37,808,027						

Table R3e. External Funding Breakdown of 10 Canadian Departments (in Canadian dollars)							
Funding Source	Sum	% of Fund	Percentile of Department Funding From Source				
			10th	25th	50th	75th	90th
NSERC	\$28,200,702	57.9%	\$117,373	\$944,842	\$2,560,706	\$3,339,499	\$8,815,915
DARPA	\$237,872	0.5%					
NIH	\$179,973	0.4%					
DOE		0.0%					
State agencies	\$2,989,517	6.1%		\$238,332	\$381,750	\$630,883	
Industry	\$4,275,183	8.8%			\$376,304		
Other defense		0.0%					
Other federal	\$2,791,894	5.7%		\$28,706	\$544,901	\$1,094,791	
Pvt foundation		0.0%					
IMLS		0.0%					
Other	\$10,060,867	20.6%		\$137,627	\$822,517	\$1,582,220	
Total	\$48,736,008						

Other Graduate Student Data (Tables Prof5-Pro7)

Table Prof5 illustrates the factors that are most likely to affect graduate student stipends. Advancement to the next stage of study and the source of funding are the most likely factors. Stipends are considerably less likely than three years ago to be affected by years of service (17 percent vs 25 percent). Less drastic drop-offs in likelihood were present in advancement to the next stage of the program (48 percent vs 52 percent) and GPA (11 percent vs 13 percent).

Tables Prof6 and Prof7 focus on incentives for recruiting graduate students. Compared with three years ago, a greater percentage of departments have one-time signing bonuses (12 percent vs 6 percent) while a smaller percentage employ stipend enhancements (17 percent vs 25 percent), guaranteed multi-year support (51 percent vs 58 percent), and paid visits to campus (37 percent vs 42 percent).

Table Prof5. Factors Affecting the Amount of a Graduate Student's Stipend

Department Type	# Dept	Advance to Next Stage of Program	Years of Service	GPA	Recruitment Enhancements	Different Stipend Sources	Other
US CS Public	103	57.3%	16.5%	7.8%	29.1%	36.9%	10.7%
US CS Private	38	34.2%	21.1%	15.8%	13.2%	26.3%	13.2%
US CE	7	28.6%	14.3%	0.0%	14.3%	28.6%	0.0%
US I	12	50.0%	8.3%	8.3%	8.3%	50.0%	16.7%
Canadian	12	25.0%	16.7%	25.0%	16.7%	66.7%	16.7%
Grand Total	172	48.3%	16.9%	10.5%	22.7%	37.2%	11.6%

Table Prof6. Departments Using Selected Graduate Student Recruitment Incentives

Department Type	# Dept	Upfront One-Time Signing Bonus	Stipend Enhancements	Guaranteed Multi-Year Support	Guaranteed Summer Support	Paid Visits to Campus	Other
US CS Public	103	11.7%	20.4%	47.6%	23.3%	34.0%	2.9%
US CS Private	38	7.9%	13.2%	52.6%	23.7%	50.0%	5.3%
US CE	7	0.0%	0.0%	28.6%	14.3%	28.6%	14.3%
US I	12	8.3%	16.7%	58.3%	8.3%	41.7%	8.3%
Canadian	12	33.3%	8.3%	75.0%	25.0%	16.7%	8.3%
Grand Total	172	11.6%	16.9%	50.6%	22.1%	36.6%	4.7%

Table Prof7. Median Amounts and Years of Selected Graduate Student Recruitment Incentives

Department Type	# Dept	Upfront One-Time Signing Bonus	Stipend Enhancements	Guaranteed Years of Support	Guaranteed Summer Support	Paid Visits to Campus
US CS Public	103	\$5,000	\$3,800	4.0	\$5,343	\$600
US CS Private	38		\$3,000	5.0	\$7,500	\$800
US CE	7					
US I	12			4.0		\$500
Canadian	12			5.0	\$9,000	
Grand Total	172	\$5,000	\$3,800	4.0	\$6,000	\$600

Space (Tables Prof8-Prof16)

With the enormous increases in undergraduate enrollments since the last survey of department profiles, it is of particular interest to see if space has grown during this time.

Compared with three years ago, median overall department space has grown by about 6 percent, the same percentage amount that it grew in the previous three years. Conference and seminar space grew the most, by 31 percent, while office and laboratory space grew by 11-16 percent (Table Prof8).

Office space and research lab space grew more at U.S. CS public departments than at U.S. CS private departments, while conference and research lab space grew more at privates. Instructional lab space grew between 22 (privates) and 26 percent (publics) at U.S. CS departments (Tables Prof9 and Prof10).

One-quarter of U.S. CS public departments reported definite plans to increase space, and one-third of U.S. CS private departments did likewise (Table Prof14). Both of these fractions are higher than three years ago, and particularly so for public departments, where only 9 percent had definite plans to increase space three years ago.

Table Prof8. Department Space, net square feet, 133 US institutions

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	12,240	4,660	542	1,270	891
25	18,744	7,332	1,035	3,048	2,051
50	29,300	12,248	2,108	7,257	3,877
75	49,156	22,115	4,468	12,077	6,978
90	78,157	39,713	7,230	17,997	12,289

Table Prof9. Department Space, net square feet, 89 US CS Public

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	11,901	4,864	502	1,717	1,311
25	18,210	6,778	895	3,818	2,351
50	30,000	11,105	1,696	8,735	4,403
75	56,528	23,963	4,010	13,493	7,652
90	79,288	42,377	6,629	18,020	12,895

Table Prof10. Department Space, net square feet, 28 US CS Private

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	15,465	5,261	594	1,160	361
25	20,896	10,894	1,246	2,695	1,547
50	27,706	15,363	2,801	6,224	2,512
75	49,219	20,414	4,640	8,849	5,220
90	61,864	33,759	6,419	17,400	9,818

Table Prof11. Department Space, net square feet, 5 US CE Departments

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10					
25	18,625	3,118	1,066	7,021	3,517
50	20,729	8,908	1,437	11,264	3,734
75	50,000	17,500	2,395	15,500	6,000
90					

Table Prof12. Department Space, net square feet, 11 US Information Departments

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	15,473	8,037	1,630	287	756
25	24,610	10,353	1,991	1,117	1,013
50	33,548	12,937	2,571	2,312	2,800
75	41,498	22,806	6,315	3,706	5,160
90	46,755	24,100	7,522	4,871	5,969

Table Prof13. Department Space, net square meters, 12 Canadian Departments

Percentiles	Total Space	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	2,136	609	77	424	0
25	3,185	1,333	132	806	433
50	5,819	1,475	306	1,176	939
75	6,732	2,236	431	1,940	1,187
90	7,932	3,418	607	2,118	1,205

Table Prof14. Definite Plans to Gain or Lose Space

Department Type	# Dept	Gain Space	No Change	Lose Space
US CS Public	96	25.0 %	72.9.0%	2.1%
US CS Private	30	33.3%	66.7%	0.0%
US CE	6	16.7%	83.3%	0.0%
US I	11	9.1%	90.9%	0.0%
Canadian	10	10.0%	90.0%	0.0%
Grand Total	153	24.2%	74.5%	1.2%

Table Prof15. Sources of Funding for Additional Space for Departments with Plans to Add

Department Type	# Dept	Percent of Departments Using Funds from Source				
		Institutional	Federal	State / Provincial	Industry	Private
US CS Public	24	70.8%	16.7%	37.5%	12.5%	33.3%
US CS Private	10	100.0%	0.0%	0.0%	0.0%	18.2%
US CE	1					
US I	1					
Canadian	1					
Grand Total	37	75.7%	10.8%	27.0%	10.8%	35.1%

Table Prof16. Full Time Staff by Type of Support – All Institutions

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10	2.0	0.0	2.0	1.0	0.0	1.0	0.0	0.0	0.0
25	3.3	0.0	4.0	1.0	0.0	1.0	0.0	0.0	0.0
50	6.0	0.0	6.0	3.0	0.0	3.0	0.0	1.0	1.0
75	11.0	1.0	11.8	5.0	0.3	5.0	1.0	4.0	4.0
90	28.2	3.0	29.6	9.0	2.3	10.2	2.1	11.3	11.6
# Depts	155	73	155	139	59	140	90	77	105

Departmental Support Staff (Tables Prof17-Prof21)

Tables Prof17-Prof22 show the distribution of staffing levels based on department type. Compared with three years ago, the median number of administrative and computer support staff rose from 5 to 6, and from 2 to 3, respectively. As was the case three years ago, median levels of administrative staff in U.S. CS

departments are higher at private institutions than at public institutions, while median levels of computer support staff are similar at public and private institutions. Higher median levels are notable in U.S. I programs for both administrative and computer support staff. This likely is because these units tend to be schools rather than departments.

Table Prof17. Full Time Staff by Type of Support – US CS Public

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10	2.0	0.0	2.0	1.0	0.0	1.0	0.0	0.0	0.0
25	3.0	0.0	3.0	1.0	0.0	1.0	0.0	0.0	0.0
50	5.0	0.0	5.2	3.0	0.0	3.0	0.0	0.6	1.0
75	10.1	1.0	11.0	4.9	0.1	5.0	1.0	3.5	3.0
90	21.0	4.4	22.8	7.4	2.8	8.4	2.0	8.6	9.0
# Depts	96	45	96	87	36	87	52	47	61

Table Prof18. Full Time Staff by Type of Support – US CS Private

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10	2.0	0.0	2.1	0.2	0.0	0.2	0.0	0.0	0.0
25	4.0	0.0	4.0	1.0	0.0	1.3	0.0	0.4	0.0
50	7.0	0.8	8.0	3.0	0.0	3.0	0.0	2.0	2.0
75	12.0	1.0	13.0	8.0	1.0	7.3	1.1	8.8	5.8
90	29.8	2.5	32.2	13.4	1.9	13.2	4.1	14.5	14.7
# Depts	33	16	33	29	12	30	20	16	24

Table Prof19. Full Time Staff by Type of Support – US CE Departments

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10									
25	5.0		5.0						
50	7.0		7.0	1.3		1.3	0.0	0.0	0.3
75	8.5		8.5						
90									
# Depts	5	2	5	4	2	4	3	3	4

Table Prof20. Full Time Staff by Type of Support – US Information Departments

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10	4.7		4.7						
25	11.5	0.0	11.5	3.0		3.0	0.0	0.6	0.0
50	19.0	0.0	19.0	4.0	0.0	4.0	0.4	1.5	1.0
75	33.0	0.5	33.0	5.0		5.0	1.0	5.0	4.0
90	44.6		45.1						
# Depts	10	5	10	9	4	9	8	6	9

Table Prof21. Full Time Staff by Type of Support – 14 Canadian Departments

	Secretarial / Administrative			Computer Support			Research		
	Institutional	External Support	Total	Institutional	External Support	Total	Institutional	External Support	Total
10	3.8		3.8	3.0		3.0			
25	4.5	0.0	4.5	4.0	0.0	4.3	0.0	0.0	0.0
50	7.0	0.0	7.0	5.5	0.0	5.5	0.0	0.0	0.0
75	8.0	0.0	10.5	7.8	1.0	7.8	0.0	1.6	2.8
90	20.0		20.0	14.1		16.1			
# Depts	11	5	11	10	5	10	7	5	7

Concluding Observations

The Taulbee Survey clearly documents the continued undergraduate enrollment boom being seen in U.S. doctoral-granting computer science programs. It also shows that departments are adding teaching faculty, TAs and, to a lesser extent, tenure-track faculty to their rolls. CRA is studying this enrollment phenomenon in more depth. A special task force led by Tracy Camp will report later this year on the results of a more targeted study of the CS enrollment boom in both doctoral-granting and non-doctoral-granting departments. Those results should be of interest to all in the computing community.

Participating Departments

US CS Public (107): Arizona State, Auburn, 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, Michigan State, Michigan Technological University, Mississippi State, Missouri Science & Technology, Montana State, Naval Postgraduate School, New Jersey Institute of Technology, New Mexico State, North Carolina A&T, North Carolina State, North Dakota State, Ohio State, Ohio, Oklahoma State, Old Dominion, Oregon State, Pennsylvania State, Portland State, Purdue, Rutgers, Southern Illinois, Stony Brook (SUNY), Texas A&M, Texas Tech, University at Albany, University at Buffalo, Universities of: Alabama (Birmingham and Tuscaloosa), Arizona, Arkansas, Arkansas at Little Rock, California (Berkeley, Davis, Irvine, Riverside, San Diego, Santa Barbara, and Santa Cruz),

Central Florida, Colorado (Boulder), Connecticut, Delaware, Florida, Georgia, Hawaii, Houston, Illinois (Chicago and Urbana Champaign), Iowa, Kansas, Kentucky, Louisiana at Lafayette, Maryland (College Park and Baltimore County), Massachusetts (Amherst and Boston), Michigan, Minnesota, Mississippi, Missouri (Columbia), Nebraska (Omaha and Lincoln), Nevada (Las Vegas and Reno), New Hampshire, New Mexico, North Carolina (Chapel Hill and Charlotte), North Dakota, North Texas, Oklahoma, Oregon, Pittsburgh, Rhode Island, South Carolina, South Florida, Tennessee (Knoxville), Texas (Arlington, Austin, Dallas, and El Paso), Utah, Vermont, Virginia, Washington, Wisconsin (Madison and Milwaukee), and Wyoming, Virginia Tech, Washington State, Wayne State, Western Michigan, and Wright State.

US CS Private (40): Boston University, Brown, Carnegie Mellon, Case Western Reserve, Clarkson, Columbia, Cornell, Dartmouth, DePaul, Drexel, Duke, Emory, Georgetown, Harvard, Howard, Illinois Institute of Technology, Johns Hopkins, Lehigh, MIT, New York University, Northeastern, Northwestern, Nova Southeastern, Polytechnic, Princeton, Rensselaer, Rice, Rochester Institute of Technology, Stanford, Stevens Institute of Technology, Toyota Technological Institute at Chicago, Tufts, Universities of: Chicago, Pennsylvania, Rochester, Southern California, and Tulsa, Washington in St. Louis, Worcester Polytechnic Institute, and Yale.

US CE (8): Northeastern, North Carolina State, Universities of: California (Santa Cruz), Central Florida, Illinois (Urbana Champaign), New Mexico, and Southern California, and Virginia Tech.

US Information (14): Cornell, Drexel, Florida State, Indiana, Penn State, Syracuse, University at Albany (SUNY), Universities of: California (Berkeley), Illinois (Urbana Champaign), Maryland (Baltimore County), Michigan, North Carolina (Chapel Hill), Pittsburgh, and Washington.

Canadian (12): Concordia, McGill, Simon Fraser, Universities of: British Columbia, Calgary, Manitoba, New Brunswick, Toronto, Victoria, Waterloo, and Western Ontario, and York.

¹The 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.

²Information (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. 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.

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

⁴All 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.