2023 Taulbee Survey
All Degree Levels Exhibit Record Number of Graduates and Strong Enrollment

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This article and the accompanying figures and tables present the results from the 53rd annual CRA Taulbee Survey[1]. 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.

CRA gathers survey data during the fall. Responses received by February 14, 2024 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 (2022-23). Data for new students in all categories refer to the current academic year (2023-24). Projected student production and information on faculty salaries are also for the current academic year; salaries are those effective January 1, 2024.

We surveyed a total of 314 Ph.D.-granting departments and received responses from 176, for an overall response rate of 56 percent, down from 61 percent last year. The response rates from CE and Canadian departments in particular continue to be low. The U.S. CS response rate of 69 percent is, as usual, the highest of all of the categories; however, it is lower than last year's 71 percent and for the second year in a row is the lowest for the past quarter century. Responses from each of the other department types also decreased from their rates last year. Figure 1 shows the history of the survey's response rates. 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 2022 and 2023 surveys. This is a more meaningful indication of the one-year changes affecting the data.

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 is also 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.

As we do each year, the CRA Survey Committee reviewed feedback from its constituents and evaluated suggestions for changes to the survey. As a result, new this year is data about doctoral program acceptances, to complement data about new student matriculation that has been published historically and data about doctoral program applications that was introduced in last year's survey. This data is of interest not only to our academic departments but to organizations such as the National Science Foundation who study pathways to the doctorate. The applications and acceptances data is reported at the end of the doctoral program section.

This year for the first time we also collected data about the extent to which graduate student stipends include insurance coverage. This data will be reported separately in *CRN* in the coming months.

We thank all of the respondents to this year's questionnaire. The participating departments are listed at the end of this article. CRA member respondents will again 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%)
2016	150/188 (80%)	8/33 (24%)	11/26 (42%)	14/21 (67%)	183/268 (68%)
2017	148/192 (77%)	8/35 (23%)	11/30 (37%)	14/24 (58%)	181/281 (64%)
2018	143/195 (73%)	5/34 (15%)	12/30 (40%)	14/24 (58%)	174/283 (61%)
2019	148/192 (77%)	7/35 (20%)	11/29 (38%)	15/22 (68%)	181/278 (65%)
2020	150/193 (78%)	6/35 (17%)	8/29 (28%)	15/22 (68%)	179/279 (64%)
2021	142/195 (73%)	6/35 (17%)	8/29 (28%)	15/23 (65%)	171/282 (61%)
2022	146/205 (71%)	7/35 (20%)	14/34 (41%)	15/23 (65%)	182/297 (61%)
2023	144/210 (69%)	6/38 (16%)	11/36 (31%)	15/30 (50%)	176/314 (56%)

Doctoral Program Production, Enrollment, Employment, and Applications

(Tables 1, D1-D14; Figures D1-D6)

Degree Production

This year's respondents reported another all-time high doctoral degree production of 2,173 for the 2022-23 academic year, breaking the 2021-22 record of 2,105 by 3.2 percent (Figure D1). U.S. CS departments in both public and private institutions increased their production despite fewer departments reporting compared with last year in each category. CE was the only area with decreased overall production compared with last year, but this year CE also had fewer departments reporting. On a per-department basis, the overall increase across the three computing areas was 9 percent, from 14.2 to 15.5 (Table D1).

Among all departments reporting both this year and last year, the number of total doctoral degrees increased by just 0.8 percent. Among U.S. CS departments reporting both years, there actually was a decrease in production of 0.8 percent (Table 1).

Figure D3 shows the relationship between doctoral degree production and department faculty size. The strata used for U.S. CS departments are described in the section on faculty salaries. Again this year, the figure indicates little relationship between doctoral degrees per tenure-track faculty and faculty size.

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		
PhDs	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**
PhD Awarded	1,799	1,883	4.7%	2,105	2,173	3.2%	1,694	1,680	-0.8%	1,928	1,943	0.8%
#Units PhD Awd	110	116	5.5%	133	140	5.3%	97	97		116	116	
PhD Enrollment	16,628	17,770	6.9%	20,284	21,241	4.7%	15,627	16,098	3.0%	18,553	19,117	3.0%
#Units PhD Enr	124	128	3.2%	154	156	1.3%	113	113		136	136	
New PhD Enroll	3,041	3,438	13.1%	3,711	4,075	9.8%	2,879	3,255	13.1%	3,426	3,790	10.6%
#Units New PhD	127	124	-2.4%	159	152	-4.4%	112	112		137	137	
Bachelor's	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**	**2022**	**2023**	**% chg**
BS Awarded	37,062	44,978	21.4%	44,981	52,910	17.6%	34,644	40,964	18.2%	41,379	47,774	15.5%
#Units BS Awd	118	124	5.1%	148	152	2.7%	106	106		130	130	
BS Enrollment	172,298	182,973	6.2%	211,030	220,368	4.4%	162,218	169,004	4.2%	192,876	202,546	5.0%
#Units BS Enr	120	123	2.5%	151	151	0.0%	107	107		132	132	
New BS Majors	39,083	43,993	12.6%	47,497	52,000	9.5%	36,069	38,716	7.3%	42,069	45,611	8.4%
#Units New BS	105	114	8.6%	133	139	4.5%	97	97		119	119	
BS Enroll/Dept	1,447.9	1,487.6	2.7%	1,398	1,459	4.4%	1,516	1,579.5	4.2%	1,461.2	1,534.4	5.0%

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	83	1,334	16.1	1,454	17.5	1,720	20.7	1,282	71	18.1
US CS Private	32	549	17.2	753	23.5	659	20.6	284	18	15.8
US CS Total	115	1,883	16.4	2,207	19.2	2,379	20.7	1,566	89	17.6
US CE	3	76	25.3	120	40.0	121	40.3	87	1	87.0
US Info	12	104	8.7	122	10.2	124	10.3	168	11	15.3
Canadian	10	110	11.0	161	16.1	182	18.2	132	6	22.0
Grand Total	140	2,173	15.5	2,610	18.6	2,806	20.0	1,953	107	18.3

Among 2022-23 Ph.D. recipients aggregated across CS, CE and I, 24.1 percent identified as female, up from 22.9 percent in 2021-22. In CS, the increase was from 22.1 to 22.7. However, unlike in prior years, this year there were a large number of CS degree recipients whose gender was not reported (7 percent; last year's report had less than one-half of one percent); thus, these year-over-year gender comparisons are more susceptible to being unreliable. The CE and I values do not have this problem. Female representation increased in CE from 14.5 to 22.0 percent and decreased in I from 44.8 to 40.0 percent (Table D2).

With respect to race/ethnicity, both CS and CE suffer from a non-reporting problem for Ph.D. recipients (over 18 percent in CS vs less than 7 percent last year), principally due to the non-reporting of the residency status of the graduates. Among those with ethnicity reported, the CS distribution across race/ethnicity is similar to that reported for 2021-22; in CE, Non-resident Aliens comprised a smaller fraction of the graduates while percentages for White and Asian graduates increased. In the I area, which did not have the non-reporting issue, the percentage of recipients who were Asian or Non-resident Alien decreased, while the percentage who were White increased compared with 2021-22 (Table D3).

Table D9 shows the gender x race/ethnicity cross-tabs for doctoral recipients. Within each area, this table shows the percentage of graduates of each gender that were of a given race/ethnicity. Due to the non-reporting issues discussed above, the I area is the one for which a year-over-year comparison is most reliable. It shows that Non-resident Alien and Asian graduates comprised a smaller fraction of both male and female I graduates, while White graduates comprised a larger fraction of both male and female I graduates.

Table D2. PhDs Awarded by Gender

	CS		CE		I		Total	
Male	1,314	77.2%	131	78.0%	101	59.4%	1,546	75.8%
Female	387	22.7%	37	22.0%	68	40.0%	492	24.1%
Nonbinary/Other	1	0.1%	0	0.0%	1	0.6%	2	0.1%
Total Known Gender	1,702		168		170		2,040	
Gender Unknown	128		2		3		133	
Grand Total	1,830		170		173		2,173	

Table D3. PhDs Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	987	66.2%	61	56.5%	90	55.2%	1,138	64.6%
Amer Indian or Alaska Native	1	0.1%	1	0.9%	0	0.0%	2	0.1%
Asian	149	10.0%	16	14.8%	15	9.2%	180	10.2%
Black or African-American	18	1.2%	2	1.9%	7	4.3%	27	1.5%
Native Hawaiian/Pac Islander	1	0.1%	1	0.9%	0	0.0%	2	0.1%
White	293	19.7%	26	24.1%	44	27.0%	363	20.6%
Multiracial, not Hispanic	9	0.6%	0	0.0%	3	1.8%	12	0.7%
Hispanic, any race	32	2.1%	1	0.9%	4	2.5%	37	2.1%
Total Residency & Ethnicity Known	1,490		108		163		1,761	
Resident, ethnicity unknown	62		3		6		71	
Residency unknown	278		59		4		341	
Grand Total	1,830		170		173		2,173	

Table D4. Employment of New PhD Recipients By Specialty

	Artificial Intelligence/Machine Learning	Computer-Supported Coop Work	Computing Education	Databases/Information Retrieval	Graphics/Visualization	Hardware/Architecture	High Performance Computing	Human-Computer Interaction	Informatics: Biomedical/Other Science	Information Science	Information Systems	Networks	Operating Systems	Programming Languages/Compilers	Robotics/Vision	Scientific/Numerical Computing	Security/Information Assurance	Social Computing/Social Informatics/CSCW	Software Engineering	Theory and Algorithms	Other	Unknown	Total	
North American PhD Granting Depts.																								
Tenure-Track	32	0	10	3	6	5	2	27	0	3	2	2	1	5	3	3	11	1	7	2	16	2	143	9.40%
Researcher	8	0	1	2	1	2	0	3	1	1	1	0	2	1	2	0	2	3	3	3	4	5	45	3.00%
Postdoc	47	0	12	2	4	2	0	15	12	1	1	5	2	3	6	2	9	3	5	11	10	15	167	11.00%
Teaching Faculty	12	0	16	1	1	1	0	11	0	5	3	3	2	3	2	0	4	1	5	3	4	3	80	5.30%
North American, Other Academic																								
Other CS/CE/I Dept	4	0	2	1	0	0	0	4	0	0	0	3	1	0	0	0	2	0	1	1	1	3	23	1.50%
Non-CS/CE/I Dept	0	0	0	1	0	0	0	1	0	2	0	0	1	0	0	0	0	0	1	0	0	0	6	0.40%
North American, Non-Academic																								
Industry	278	0	15	48	23	31	18	46	21	6	16	21	22	25	56	11	46	6	56	20	56	49	870	57.50%
Government	7	0	0	0	1	2	4	1	2	0	0	3	0	0	1	2	5	0	1	2	6	5	42	2.80%
Self-Employed	8	0	1	2	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	1	16	1.10%
Unemployed	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0.10%
Other	7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	10	0.70%
Total Inside North America																								
	404	0	57	60	36	43	24	108	36	18	23	39	33	38	70	18	79	14	80	42	97	85	1,404	92.70%
Outside North America																								
Ten-Track in PhD	1	0	1	0	0	0	0	3	1	1	1	1	0	1	0	0	8	3	4	1	2	0	28	1.80%
Researcher in PhD	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	10	0.70%
Postdoc in PhD	7	0	1	1	1	0	0	0	0	0	1	1	0	3	0	0	2	0	0	3	2	0	22	1.50%
Teaching in PhD	2	0	3	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	9	0.60%
Other Academic	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	3	0.20%
Industry	10	0	4	2	1	0	0	0	0	0	0	0	0	2	4	0	2	0	3	3	0	1	32	2.10%
Government	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0.20%
Self-Employed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.10%
Unemployed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.10%
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.10%
Total Outside NA	27	0	9	3	3	0	0	4	1	1	3	3	1	6	4	0	13	3	9	8	7	5	110	7.30%
Total with Employment Data, Inside North America plus Outside North America																								
	431	0	66	63	39	43	24	112	37	19	26	42	34	44	74	18	92	17	89	50	104	90	1,514	
Employment Type & Location Unknown																								
	46	0	1	12	15	11	7	8	5	15	5	9	4	10	15	1	19	4	16	14	37	405	659	
Grand Total	**477**	**0**	**67**	**75**	**54**	**54**	**31**	**120**	**42**	**34**	**31**	**51**	**38**	**54**	**89**	**19**	**111**	**21**	**105**	**64**	**141**	**495**	**2,173**	

Doctoral Program Enrollment

The total doctoral enrollment reported by this year's responding departments increased by 4.7 percent when all departments are included and increased by 6.9 percent if only U.S. CS departments are included. There were two additional departments overall that reported doctoral enrollment this year, with four additional U.S. CS departments reporting. When only departments that reported both

Table D4a. Detail of Industry Employment

	Artificial Intelligence/Machine Learning	Computer-Supported Coop Work	Computing Education	Databases/Information Retrieval	Graphics/Visualization	Hardware/Architecture	High Performance Computing	Human-Computer Interaction	Informatics: Biomedical/Other Science	Information Science	Information Systems	Networks	Operating Systems	Programming Languages/Compilers	Robotics/Vision	Scientific/Numerical Computing	Security/Information Assurance	Social Computing/Social Informatics/CSCW	Software Engineering	Theory and Algorithms	Other	Unknown	Total	
Inside North America																								
Research	215	0	9	27	20	14	13	28	14	6	10	11	11	15	38	7	34	6	24	11	31	20	564	64.8%
Non-Research	46	0	1	16	2	16	4	12	4	0	5	10	6	8	14	2	11	0	27	8	24	13	229	26.3%
Postdoctorate	7	0	2	0	1	0	0	3	3	0	1	0	4	0	3	1	0	0	0	0	1	3	29	3.3%
Type Not Specified	10	0	3	5	0	1	1	3	0	0	0	0	1	2	1	1	1	0	5	1	0	13	48	5.5%
Total Inside NA	278	0	15	48	23	31	18	46	21	6	16	21	22	25	56	11	46	6	56	20	56	49	870	
Outside North America																								
Research	7	0	1	2	0	0	0	0	0	0	0	0	0	1	1	0	1	0	2	1	0	0	16	50.0%
Non-Research	2	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0	1	0	0	2	0	1	10	31.3%
Postdoctorate	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	12.5%
Type Not Specified	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	6.3%
Total Outside NA	10	0	4	2	1	0	0	0	0	0	0	0	0	2	4	0	2	0	3	3	0	1	32	

Table D5. New PhD Students by Department Type

	CS				CE				I				Total	
Department Type	**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	2,057	143	2,200	25	79	7	86	6.6	72	16	88	9.8	2,374	26.4
US CS Private	1,002	52	1,054	31	2	1	3	1.5	7	0	7	3.5	1,064	31.3
US CS Total	3,059	195	3,254	26.7	81	8	89	5.9	79	16	95	8.6	3,438	27.7
US CE	0	0	0		219	13	232	46.4	0	0	0		232	46.4
US Info	18	0	18	9	0	0	0		185	1	186	15.5	204	17
Canadian	160	34	194	17.6	4	3	7	7					201	18.3
Grand Total	3,237	229	3,466	25.7	304	24	328	15.6	264	17	281	12.2	4,075	26.8

Table D5a. New PhD Students from Outside North America

Department Type	CS	CE	I	Total New Outside	Total New	% outside North America
US CS Public	1,551	61	57	1,669	2,374	70.3%
US CS Private	493	2	4	499	1,064	46.9%
US CS Total	2,044	63	61	2,168	3,438	63.1%
US CE		129		129	232	55.6%
US Info	14	-	124	138	204	67.6%
Canadian	82	5	-	87	201	43.3%
Grand Total	2,140	197	185	2,522	4,075	61.9%

Table D6. PhD Enrollment by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	96	11,750	66.4%	679	37.7%	586	33.7%	13,015	61.3%
US CS Private	32	4,665	26.3%	27	1.5%	63	3.6%	4,755	22.4%
US CS Total	128	16,415	92.7%	706	39.2%	649	37.4%	17,770	83.7%
US CE	4		0.0%	1,089	60.5%		0.0%	1,089	5.1%
US Info	13	111	0.6%		0.0%	896	51.6%	1,007	4.7%
Canadian	11	1,178	6.7%	5	0.3%	192	11.1%	1,375	6.5%
Grand Total	156	17,704		1,800		1,737		21,241	

Table D7. PhD Enrollment by Gender

	CS		CE		I		Total	
Male	12,230	74.6%	1,449	80.8%	798	52.6%	14,477	73.5%
Female	4,125	25.2%	344	19.2%	708	46.7%	5,177	26.3%
Nonbinary/Other	30	0.2%	-	0.0%	10	0.7%	40	0.2%
Total Known Gender	16,385		1,793		1,516		19,694	
Gender Unknown	1,319		7		221		1,547	
Grand Total	17,704		1,800		1,737		21,241	

Table D8. PhD Enrollment by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	9,842	66.6%	876	68.1%	850	56.1%	11,568	65.8%
Amer Indian or Alaska Native	17	0.1%	-	0.0%	7	0.5%	24	0.1%
Asian	1,414	9.6%	104	8.1%	112	7.4%	1,630	9.3%
Black or African-American	236	1.6%	19	1.5%	75	5.0%	330	1.9%
Native Hawaiian/Pac Islander	8	0.1%	1	0.1%	-	0.0%	9	0.1%
White	2,755	18.6%	219	17.0%	392	25.9%	3,366	19.1%
Multiracial, not Hispanic	191	1.3%	22	1.7%	29	1.9%	242	1.4%
Hispanic, any race	315	2.1%	46	3.6%	49	3.2%	410	2.3%
Total Residency & Ethnicity Known	14,778		1,287		1,514		17,579	
Resident, ethnicity unknown	548		133		15		696	
Residency unknown	2,378		380		208		2,966	
Grand Total	17,704		1,800		1,737		21,241	

Table D9. PhDs Awarded by Gender and Ethnicity, From 140 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	745	234	0	8	65.6%	68.6%	0.0%	46	15	0	0	57.5%	53.6%		53	34	0	3	54.1%	55.7%	0.0%	1,138	64.6%
Amer Indian or Alaska Native	1	0	0	0	0.1%	0.0%	0.0%	1	0	0	0	1.3%	0.0%		0	0	0	0	0.0%	0.0%	0.0%	2	0.1%
Asian	108	39	0	2	9.5%	11.4%	0.0%	12	4	0	0	15.0%	14.3%		10	5	0	0	10.2%	8.2%	0.0%	180	10.2%
Black or African-American	8	9	0	1	0.7%	2.6%	0.0%	0	2	0	0	0.0%	7.1%		5	2	0	0	5.1%	3.3%	0.0%	27	1.5%
Native Hawaiian/ Pac Islander	1	0	0	0	0.1%	0.0%	0.0%	0	1	0	0	0.0%	3.6%		0	0	0	0	0.0%	0.0%	0.0%	2	0.1%
White	242	49	1	1	21.3%	14.4%	100.0%	20	6	0	0	25.0%	21.4%		29	14	1	0	29.6%	23.0%	100.0%	363	20.6%
Multiracial, not Hispanic	6	2	0	1	0.5%	0.6%	0.0%	0	0	0	0	0.0%	0.0%		0	3	0	0	0.0%	4.9%	0.0%	12	0.7%
Hispanic, any race	24	8	0	0	2.1%	2.3%	0.0%	1	0	0	0	1.3%	0.0%		1	3	0	0	1.0%	4.9%	0.0%	37	2.1%
Total Residency & Ethnicity Known	1,135	341	1	13				80	28	0	0				98	61	1	3				1,761	
Resident, ethnicity unknown	41	12	0	9				2	1	0	0				1	5	0	0				71	
Residency unknown	138	34	0	106				49	8	0	2				2	2	0	0				341	
Gender Totals	1,314	387	1	128				131	37	0	2				101	68	1	3				2,173	
%	77.2%	22.7%	0.1%					78.0%	22.0%	0.0%					59.4%	40.0%	0.6%						

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

Table D10. PhD Enrollment by Gender and Ethnicity, From 156 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	7,221	2,428	6	187	66.7%	66.3%	25.0%	721	154	0	1	68.7%	65.5%		455	370	1	24	57.7%	53.8%	12.5%	11,568	65.8%
Amer Indian or Alaska Native	12	5	0	-	0.1%	0.1%	0.0%	-	-	0	0	0.0%	0.0%		3	4	0	0	0.4%	0.6%	0.0%	24	0.1%
Asian	953	439	3	19	8.8%	12.0%	12.5%	81	23	0	0	7.7%	9.8%		56	54	1	1	7.1%	7.8%	12.5%	1,630	9.3%
Black or African-American	144	91	0	1	1.3%	2.5%	0.0%	16	3	0	0	1.5%	1.3%		33	42	0	0	4.2%	6.1%	0.0%	330	1.9%
Native Hawaiian/ Pac Islander	7	1	0	-	0.1%	0.0%	0.0%	-	1	0	0	0.0%	0.4%		-	-	0	0	0.0%	0.0%	0.0%	9	0.1%
White	2,122	579	10	44	19.6%	15.8%	41.7%	181	37	0	1	17.2%	15.7%		209	173	6	4	26.5%	25.1%	75.0%	3,366	19.1%
Multiracial, not Hispanic	131	55	2	3	1.2%	1.5%	8.3%	19	3	0	0	1.8%	1.3%		16	13	0	0	2.0%	1.9%	0.0%	242	1.4%
Hispanic, any race	236	62	3	14	2.2%	1.7%	12.5%	32	14	0	0	3.0%	6.0%		17	32	0	0	2.2%	4.7%	0.0%	410	2.3%
Total Residency & Ethnicity Known	10,826	3,660	24	268				1,050	235	0	2				789	688	8	29				17,579	
Resident, ethnicity unknown	363	135	1	49				96	37	0	0				4	11	0	0				696	
Residency unknown	1,041	330	5	1,002				303	72	0	5				5	9	2	192				2,966	
Gender Totals	12,230	4,125	30	1,319				1,449	344	0	7				798	708	10	221				21,241	
%	74.6%	25.2%	0.2%					80.8%	19.2%	0.0%					52.6%	46.7%	0.7%						

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

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Table D11. New PhD Enrollment by Gender

	CS		CE		I		Total	
Male	2,342	74.3%	240	79.7%	190	49.9%	2,772	72.3%
Female	801	25.4%	60	19.9%	187	49.1%	1,048	27.3%
Nonbinary/Other	10	0.3%	1	0.3%	4	1.0%	15	0.4%
Total Known Gender	3,153		301		381		3,835	
Gender Unknown	214		8		5		227	
Grand Total	3,367		309		386		4,062	

Table D12. New PhD Enrollment by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	2,000	70.0%	152	63.9%	251	66.2%	2,403	69.2%
Amer Indian or Alaska Native	7	0.2%	0	0.0%	1	0.3%	8	0.2%
Asian	277	9.7%	30	12.6%	40	10.6%	347	10.0%
Black or African-American	55	1.9%	3	1.3%	17	4.5%	75	2.2%
Native Hawaiian/Pac Islander	2	0.1%	0	0.0%	0	0.0%	2	0.1%
White	415	14.5%	36	15.1%	52	13.7%	503	14.5%
Multiracial, not Hispanic	39	1.4%	7	2.9%	7	1.8%	53	1.5%
Hispanic, any race	62	2.2%	10	4.2%	11	2.9%	83	2.4%
Total Residency & Ethnicity Known	2,857		238		379		3,474	
Resident, ethnicity unknown	154		11		1		166	
Residency unknown	356		60		6		422	
Grand Total	3,367		309		386		4,062	

years are considered, doctoral enrollment increased 3.0 percent when aggregated across all department types and also increased by 3.0 percent across U.S. CS departments. Both of these increases are lower than what was observed last year among departments reporting year-over-year (Table 1).

U.S. CS departments with larger tenure-track faculty size tend to have larger doctoral enrollment per faculty member than do smaller sized departments. This relationship holds at both public and private institutions (Figure D4).

The fraction of females among enrolled doctoral students of known gender rose for the eighth straight year, from 26.1 percent to 26.3 percent across the three areas of CS, CE and I combined. In CS, the fraction rose from 24.9 percent in 2021-22 to 25.2 percent in 2022-23 (Table D7). As was the case with the doctoral graduates data, there are many more enrolled doctoral students whose gender was not reported this year compared with last year (7.5 percent in CS vs 3.3 percent last year; over 12 percent in I vs less than 5 percent last year), so the year-over-year comparisons should be interpreted with this in mind.

Doctoral enrollment diversity by race/ethnicity is shown in Table D8. It, too, suffers from a large fraction of students in CS whose race/ethnicity was not reported, but this year's 16.5 percent is only slightly larger than last year's 15.0 percent. Among those students whose race/ethnicity is known, the overall fraction of doctoral students who were neither Non-resident Aliens, Asian, nor White was 5.6 percent; this is little changed from the 5.7 percent reported last year. In CS programs, this year's fraction was 5.2 percent while

Table D13. New PhD Enrollment by Gender and Ethnicity, From 150 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	1,472	485	4	39	70.7%	68.0%	44.4%	121	31	0	0	62.7%	68.9%		130	119	0	2	69.1%	64.7%	0.0%	2,403	69.2%
Amer Indian or Alaska Native	5	2	0	0	0.2%	0.3%	0.0%	0	0	0	0	0.0%	0.0%		0	1	0	0	0.0%	0.5%	0.0%	8	0.2%
Asian	186	85	2	4	8.9%	11.9%	22.2%	27	3	0	0	14.0%	6.7%		18	20	2	0	9.6%	10.9%	50.0%	347	10.0%
Black or African-American	40	15	0	0	1.9%	2.1%	0.0%	2	1	0	0	1.0%	2.2%		5	11	1	0	2.7%	6.0%	25.0%	75	2.2%
Native Hawaiian/ Pac Islander	2	0	0	0	0.1%	0.0%	0.0%	0	0	0	0	0.0%	0.0%		0	0	0	0	0.0%	0.0%	0.0%	2	0.1%
White	313	93	2	7	15.0%	13.0%	22.2%	27	9	0	0	14.0%	20.0%		28	24	0	0	14.9%	13.0%	0.0%	503	14.5%
Multiracial, not Hispanic	19	20	0	0	0.9%	2.8%	0.0%	6	1	0	0	3.1%	2.2%		3	3	0	1	1.6%	1.6%	0.0%	53	1.5%
Hispanic, any race	45	13	1	3	2.2%	1.8%	11.1%	10	0	0	0	5.2%	0.0%		4	6	1	0	2.1%	3.3%	25.0%	83	2.4%
Total Residency & Ethnicity Known	2,082	713	9	53				193	45	0	0				188	184	4	3				3,474	
Resident, ethnicity unknown	108	40	1	5				8	0	1	2				0	1	0	0				166	
Residency unknown	152	48	0	156				39	15	0	6				2	2	0	2				422	
Gender Totals	2,342	801	10	214				240	60	1	8				190	187	4	5				4,062	
%	74.3%	25.4%	0.3%					79.7%	19.9%	0.3%					49.9%	49.1%	1.0%						

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

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Table DI4. PhD Applications and Acceptances to begin in 2023-2024 Academic Year (N=95)

Applications				
	International	Domestic	Total	% Intl
Male	19,822	5,143	24,965	79.4%
Female	6,834	1,696	8,530	80.1%
Nonbinary	45	85	130	34.6%
Gender Unk	2,091	645	2,736	76.4%
Total	28,792	7,569	36,361	79.2%

Acceptances				
	International	Domestic	Total	% Intl
Male	2,418	932	3,350	72.2%
Female	928	412	1,340	69.3%
Nonbinary	3	9	12	25.0%
Gender Unk	276	134	410	67.3%
Total	3,625	1,487	5,112	70.9%

New Enrollment (For new admits + transfers from masters, so not quite the same population as applications and acceptances)						
	International	Domestic	Total	% Intl	(Unknown Res)	
Male	1,162	522	1,785	65.1%	101	1,785
Female	433	217	691	62.7%	41	691
Nonbinary	2	9	11	18.2%	0	11
Gender Unk	40	21	67	59.7%	6	67
Total	1,637	769	2,554	64.1%	5,112	70.9%

** This is total computed from gender/residence division, from 95 departments
** Domestic calculated from Total - Nonresident - Unknown (not shown on this table), so Intl + Domestic not equal Total because of Unknown
These stats are for the departments that provided nonzero numbers of applications, acceptances, and new PhD enrollment, total and international, with domestic breakdown.

PhD Applications, Domestic Breakdown by Race/Ethnicity										
	Native Amer	Asian	Black	Pac Islander	White	Multiracial	Hispanic	Race/Eth Unk	Total	% Black/ Native Am/ Hispanic
Male	16	1,512	238	2	2,008	108	177	1,082	5,143	8.4%
Female	3	521	115	0	655	50	57	295	1,696	10.3%
Nonbinary	0	14	2	0	41	6	5	17	85	8.2%
Gender Unk	0	34	5	0	60	4	16	526	645	3.3%
Total	19	2,081	360	2	2,764	168	255	1,920	7,569	8.4%

PhD Acceptances, Domestic Breakdown by Race/Ethnicity										
	Native Amer	Asian	Black	Pac Islander	White	Multiracial	Hispanic	Race/Eth Unk	Total	% Black/ Native Am/ Hispanic
Male	4	253	49	1	408	23	64	131	933	12.6%
Female	2	125	34	0	180	10	28	32	411	15.6%
Nonbinary	0	2	1	0	2	1	2	2	10	30.0%
Gender Unk	0	8	0	0	18	3	3	101	133	2.3%
Total	6	388	84	1	608	37	97	266	1,487	12.6%

Table D14. *(continued)*

New PhD Enrollment, Domestic Breakdown by Race/Ethnicity										
	Native Amer	Asian	Black	Pac Islander	White	Multiracial	Hispanic	Race/Eth Unk	Total	% Black/ Native Am/ Hispanic
Male	5	144	30	1	263	16	47	16	522	15.9%
Female	3	73	17	0	84	18	14	8	217	15.7%
Nonbinary	0	4	0	0	1	0	2	2	9	22.2%
Gender Unk	0	4	0	0	7	1	3	6	21	14.3%
Total	8	225	47	1	355	35	66	32	769	15.9%

last year it was 5.3 percent. The fraction of enrolled doctoral students who were Non-resident Aliens rose to 65.8 percent overall and rose to 66.6 percent in CS. Figure D2 shows the history of Non-resident Alien enrollment as a fraction of total doctoral enrollment.

White students continue to comprise a greater percentage of enrolled males than enrolled females in all three disciplines. This year, Non-resident Aliens also comprise a somewhat greater percentage of enrolled male students than enrolled female students in all three disciplines (Table D10).

At U.S. CS departments, the average number of students per department who passed qualifier exams in 2022-23 increased to 20.7 from last year's reported 17.1. Last year there was a decline, but this year's increase more than made up for that decline. The average per department this year was similar at public and private institutions. The average number per U.S. CS department who passed

Figure D1. PhD Production

CRA Taulbee Survey 2023

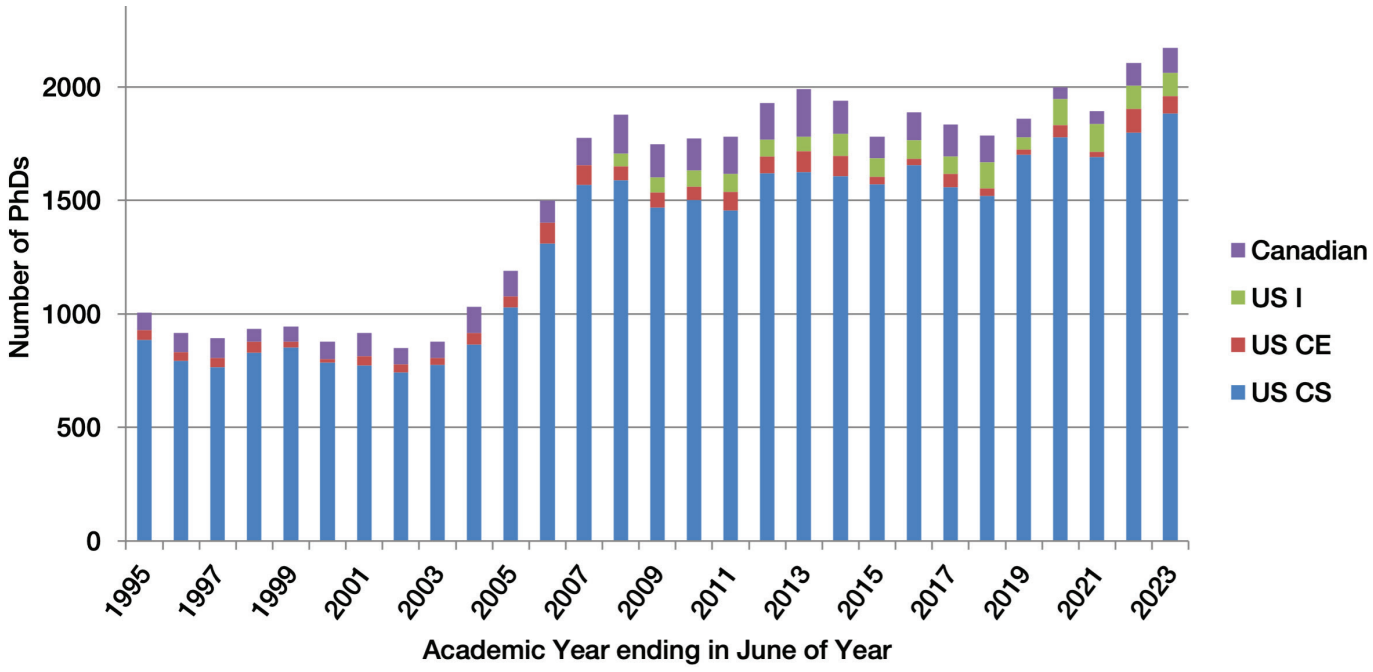


Figure D2. Nonresident Aliens as Fraction of PhD Enrollments

CRA Taulbee Survey 2023

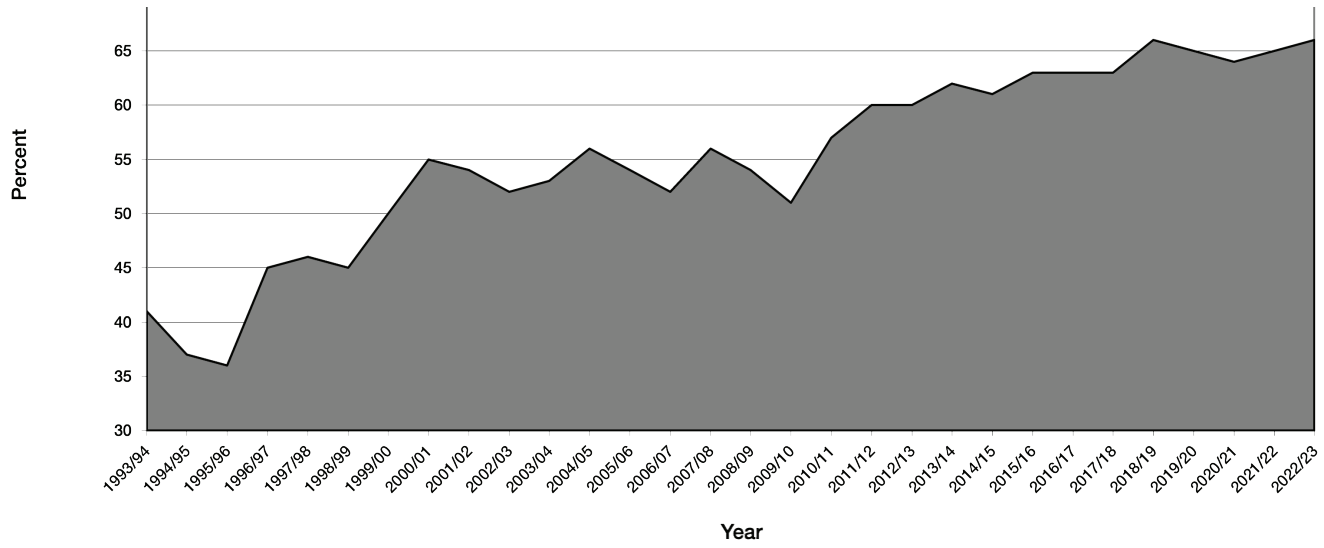


Figure D3. PhD Degrees Granted by Tenure-Track Size

CRA Taulbee Survey 2023

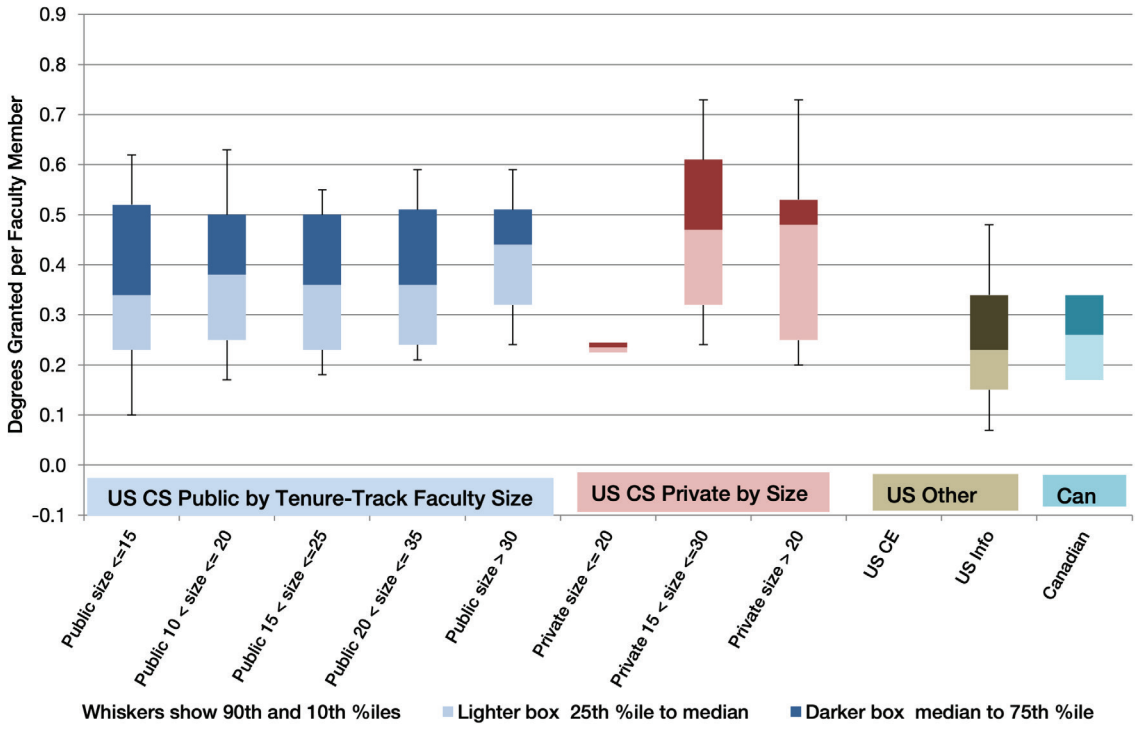


Figure D4. PhD Enrollment Normalized by Tenure-Track Size

CRA Taulbee Survey 2023

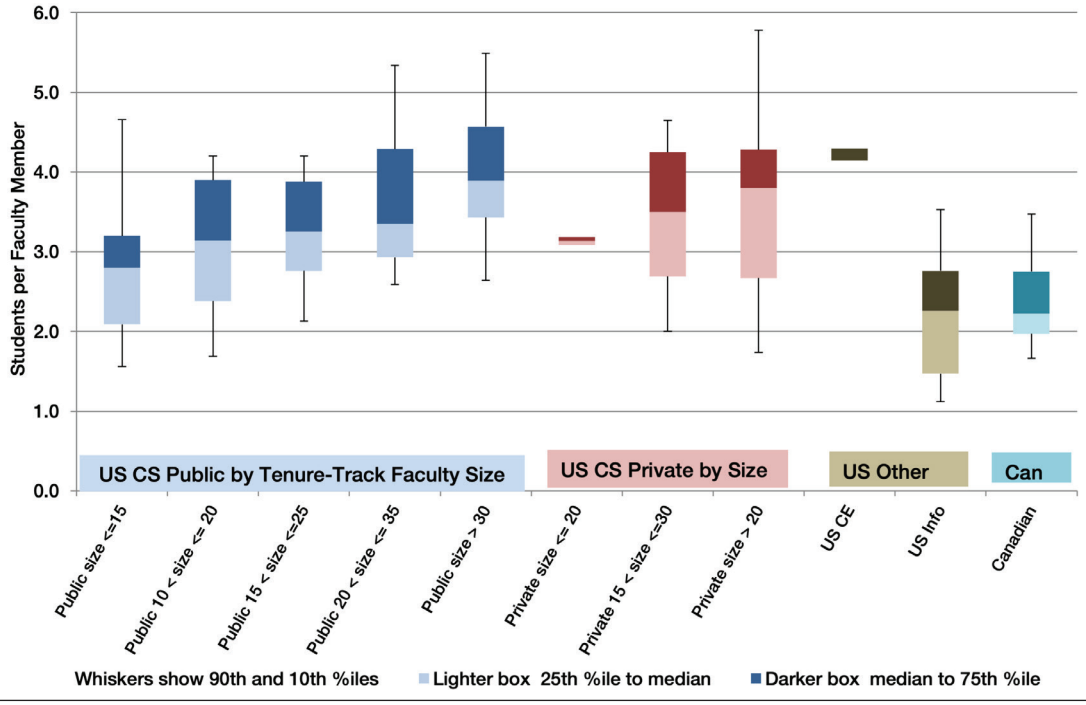


Figure D5. CS Pipeline corrected for year of entry

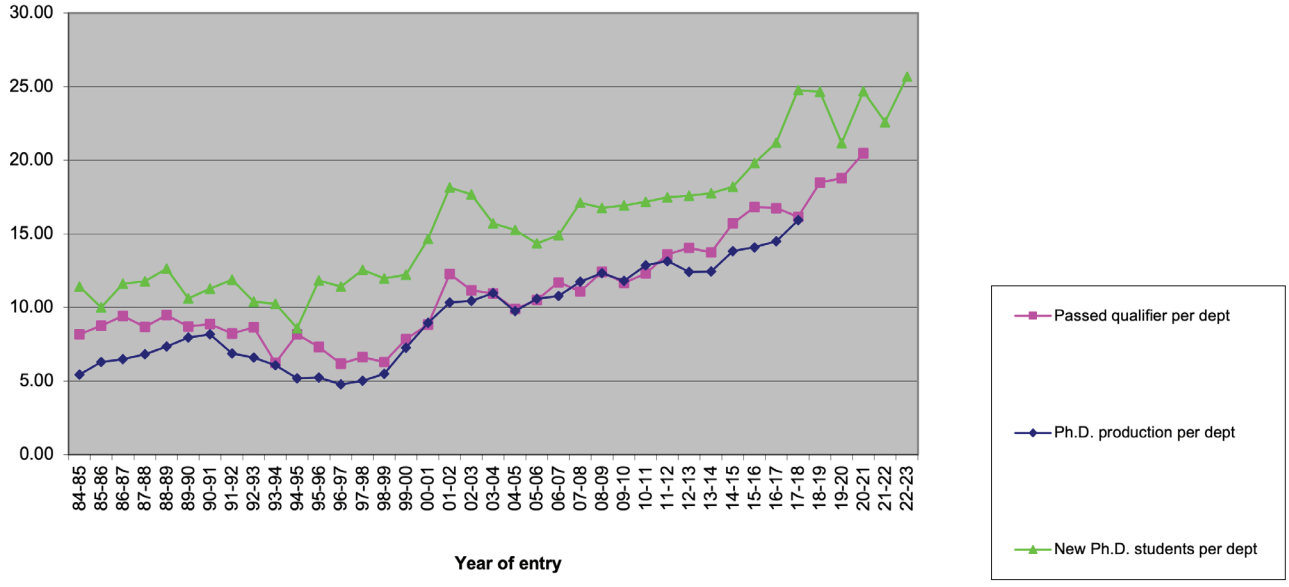
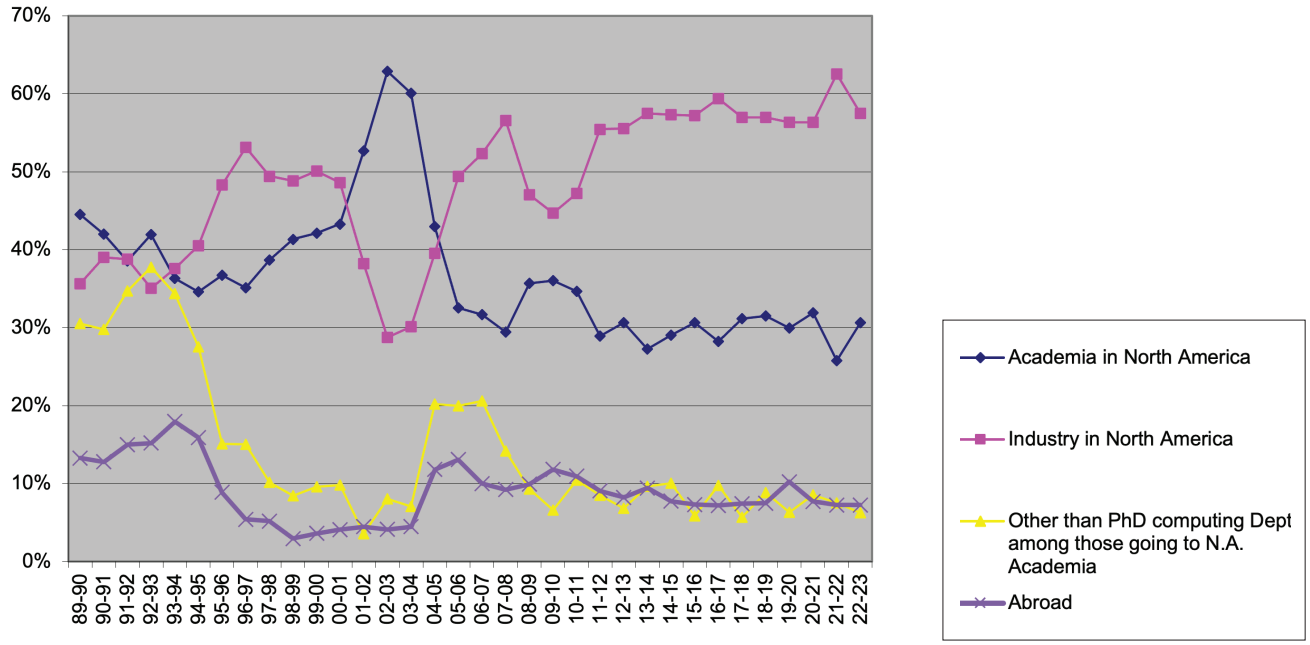


Figure D6. Employment Trends for New Ph.D.s



thesis candidacy exams in 2022-23 (most, but not all, departments have such exams) increased from 16.2 in 2021-22 to 17.6 in 2022-23; public institutions showed an increase in the average who passed thesis candidacy, while private institution showed a decrease from last year's level (Table D1).

The number of reported new Ph.D. students per department increased by 15 percent this year compared with last year's reporting departments when all departments are considered (26.8 reported this year vs 23.3 last year). U.S. CS departments at both public and private institutions showed increases; only Canadian departments reported a decline. Among departments that reported both years, the number of new Ph.D. students increased among both U.S. CS departments and all departments combined, the reverse of what happened last year (Tables 1 and D5).

Tables D11-D13 break down the newly enrolled doctoral students by gender, race/ethnicity, and gender x race/ethnicity. These tables are, respectively, similar in format to Tables D7, D8 and D10 for total enrollment. The overall profile of this year's new doctoral student cohort is slightly less diverse in both the gender and race/ethnicity dimension than was last year's cohort. This is the opposite of what was observed last year. However, the diversity in new students is somewhat better in both dimensions than is the diversity in total doctoral enrollment.

The proportion of new doctoral students from outside North America increased to 61.9 percent from 57.3 percent last year. All department types other than U.S. CE experienced increases this year (Table D5a).

Figure D5 shows a graphical view of the Ph.D. pipeline for U.S. computer science and Canadian departments, the main producers of CS doctoral degrees. The data in this graph are normalized by the number of reporting departments. 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 predicts increased Ph.D. production again next year. Indeed, all department types are forecasting increases in Ph.D. production (Table D1). However, based on past experience, the amount of the increase tends to be less than departments estimate.

Ph.D. Employment

Figure D6 shows the employment trend of new Ph.D.s in academia and industry within North America, those taking employment outside of North America, and those going to academia in North America who took positions in departments other than Ph.D.-granting CS and CE departments. Table D4 shows a more detailed breakdown of the employment data for new Ph.D.s.

Among the new 2022-23 Ph.D.s for whom employment information was known, the percentage who took positions in North American industry in 2023-24 was 57.5 percent, down from the near record 62.5 percent reported last year for the new 2021-22 Ph.D.s. Conversely, the percentage who took North American academic jobs was 30.6, considerably higher than last year's reported record low of 25.8 percent.

Research positions were the choice of more than 2/3 of the doctoral graduates who went to North American industry and for whom the type of industry position was known (Table D4a), a slightly higher fraction than last year. This year, definitive data was provided for over 94 percent of the graduates who went to North American industry, an increase from last year's percentage. Among those graduates taking academic positions in North America, the percentage who did not go to a doctoral-granting computing department was 6.3, compared to 7.5 reported in last year's survey. This number has declined for two years in a row and is now at the same level as it was three years ago, during the COVID year of 2019-20.

Of those graduates whose employment is known, 7.3 percent of Ph.D. graduates reported taking positions outside of North America, the same percentage as reported last year. For the second year in a row, a somewhat smaller percentage of these graduates went to an industry position than did so the previous year (29 vs 32 percent reported last year), while a somewhat larger percentage (55 vs 52 percent) went to some kind of tenure-track, research, or postdoc position in a doctoral-granting institution. Definitive data was provided for 94 percent of the graduates who went to non-North American industry positions, a slightly higher percentage compared with last year.

When academic and industry postdocs are combined, the result is that 12.7 percent of 2022-23 doctoral graduates whose employment was known took some type of postdoctoral position. This is about the same percentage as reported last year.

There were three doctoral graduates for whom employment information was known who were reported as unemployed. However, 30.3 percent of new Ph.D.s' employment status was unknown, higher than the 26.7 percent reported last year. The lack of information about the employment of three in ten graduates may skew the real overall percentages for certain employment categories.

Table D4 also indicates the areas of specialty of new Ph.D.s. Artificial intelligence/machine learning continues to be by far the most popular area, comprising more than 1/4 of all doctoral degrees awarded for which the area was known. Human computer interaction, security/information assurance, software engineering, and robotics/vision rounded out the top five among the defined areas. Human computer interaction and robotics/vision were not in last year's top five, while databases/information retrieval and theory/algorithms dropped out of the top five this year. Approximately 23 percent of the Ph.D.s are categorized into the area "unknown"; last year about 18 percent were unknown. Another 6.5 percent were categorized as "other", more than all but the first-place AI/ML category.

Doctoral Program Applications and Acceptances

Last year, we began asking departments to report the number of domestic and international applications for admission to their current year doctoral programs, disaggregated by gender and race/ethnicity. This year, in addition to asking departments about the

number of domestic and international applications for 2023-24, we asked them to report the number of acceptances from these applications. The applications, acceptances, and matriculation information (the number of new doctoral students in the program for 2023-24) gives us some perspective on the overall admissions activity for the 2023-24 academic year.

Table D14 shows that 95 U.S. CS departments contributed application and acceptance data for 2023-24 matriculations, disaggregated by gender and domestic vs international. Among these 95 departments, about one quarter of the applications from students whose gender was known were from those who identified as female, whether domestic (24.5 percent female) or international (25.6 percent female). A somewhat higher fraction of those accepted into the program were female (30.5 percent of domestic and 27.7 percent of international). The percentage of new doctoral students in these 95 departments who are female was 29.0 for domestic students and 27.1 for international students. However, the new doctoral student percentages include those who entered the doctoral program by transfer from the master's program; these transfer students aren't included in the application and acceptance counts, so it is inappropriate to tie the matriculated percentages to the application and acceptance percentages.

For domestic applicants, acceptances, and matriculated students in these departments, Table D14 also indicates the gender by race/ethnicity breakdowns. Among male applicants whose race/ethnicity was known, 10.7 percent were Native American, Black, Pacific Islander or Hispanic. Among female applicants, this percentage was 12.5. The percentages among acceptances whose race/ethnicity was known were 14.7 for male acceptances and 16.9 percent for female acceptances. Among matriculated students in these departments whose race/ethnicity was known (including those who transferred from the master's program), a similar percentage of male and female students were Native American, Black, Pacific Islander or Hispanic (16.4 percent of male students and 16.3 percent of female students).

Master's and Bachelor's Program 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 M1-M8; Figures M1-M2)

Overall master's degree production ballooned in 2022-23, a natural result of the two consecutive years of post-COVID large increases in total master's enrollment reported in the previous two Taulbee surveys. Both the total number of master's degrees produced (40,596) and the average per reporting department (260.1) are more than double those from last year's report and are the largest reported master's production levels in the history of the Taulbee Survey. U.S. CS departments at public institutions, which comprise the largest number of departments in the survey, collectively tripled their master's degree production from that reported last year (Table M1).

Table M1. Master's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	94	24,622	72.5%	424	29.4%	1,289	24.8%	26,335	64.9%
US CS Private	33	8,212	24.2%	23	1.6%	993	19.1%	9,228	22.7%
US CS Total	127	32,834	96.7%	447	31.0%	2,282	43.9%	35,563	87.6%
US CE	5		0.0%	959	66.4%		0.0%	959	2.4%
US Info	13	95	0.3%		0.0%	2,625	50.5%	2,720	6.7%
Canadian	11	1,014	3.0%	38	2.6%	289	5.6%	1,341	3.3%
Grand Total	156	33,943		1,444		5,196		40,583	

Table M2. Master's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	23,622	73.1%	1,007	75.3%	2,490	52.4%	27,119	70.6%
Female	8,678	26.8%	331	24.7%	2,257	47.5%	11,266	29.3%
Nonbinary/Other	26	0.1%	0	0.0%	2	0.0%	28	0.1%
Total Known Gender	32,326		1,338		4,749		38,413	
Gender Unknown	1,617		106		447		2,170	
Grand Total	33,943		1,444		5,196		40,583	

Table M3. Master's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	18,651	60.2%	1,054	76.3%	2,709	56.9%	22,414	60.4%
Amer Indian or Alaska Native	16	0.1%	1	0.1%	3	0.1%	20	0.1%
Asian	4,560	14.7%	112	8.1%	444	9.3%	5,116	13.8%
Black or African-American	517	1.7%	12	0.9%	194	4.1%	723	1.9%
Native Hawaiian/Pac Islander	17	0.1%	1	0.1%	3	0.1%	21	0.1%
White	5,704	18.4%	155	11.2%	1,135	23.8%	6,994	18.9%
Multiracial, not Hispanic	455	1.5%	22	1.6%	117	2.5%	594	1.6%
Hispanic, any race	1,043	3.4%	24	1.7%	154	3.2%	1,221	3.3%
Total Residency & Ethnicity Known	30,963		1,381		4,759		37,103	
Resident, ethnicity unknown	788		15		63		866	
Residency unknown	2,192		48		374		2,614	
Grand Total	33,943		1,444		5,196		40,583	

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

Department Type	# Depts	CS		CE		I		Total	
US CS Public	84	14,129	67.2%	362	36.5%	907	19.6%	15,398	57.8%
US CS Private	29	5,802	27.6%	30	3.0%	891	19.3%	6,723	25.2%
US CS Total	113	19,931	94.8%	392	39.5%	1,798	38.9%	22,121	83.0%
US CE	4		0.0%	562	56.7%		0.0%	562	2.1%
US Info	13	108	0.5%	0	0.0%	2,738	59.2%	2,846	10.7%
Canadian	11	985	4.7%	38	3.8%	91	2.0%	1,114	4.2%
Grand Total	141	21,024		992		4,627		26,643	

Figure M1 shows the master's degrees granted per tenure-track faculty for the various department types. In U.S. CS departments, larger departments tend to produce more master's degrees per faculty member, with a more pronounced difference in departments at private institutions. The same relationship was observed last year.

The proportion of female graduates among CS master's degree recipients increased slightly, from 26.3 percent in 2021-22 to 26.8 percent in 2022-23. Both the CE and I areas had a decline in percentage of female graduates, resulting in an overall decline from 30.9 percent female in 2021-22 to 29.3 percent in 2022-23. As was the case with respect to doctoral graduates, this year there is a

Table M5. New Master's Students by Department Type

Department Type	CS			CE			I			Total			Outside North America	
	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.	# Depts	%
US CS Public	14,578	91	160	329	18	18.3	1,091	14	77.9	15,998	92	173.9	10,160	63.5%
US CS Private	7,300	33	221	36	3	12	738	6	123	8,074	33	244.7	4,990	61.8%
US CS Total	21,878	124	176	365	21	17.4	1,829	20	91.5	24,072	125	192.6	15,150	62.9%
US CE		0		582	5	116.4		0		582	5	116.4	413	71.0%
US Info	132	2	66	0	0		2,651	13	203.9	2,783	13	214.1	1,522	54.7%
Canadian	967	11	88	38	1	38	91	1	91	1,096	11	99.6	426	38.9%
Grand Total	22,977	137	168	985	27	36.5	4,571	34	134.4	28,533	154	185.3	17,511	61.4%

Table M6. Total Master's Enrollment by Department Type

Department Type	CS			CE			I			Total		
	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.	Total	# Depts	Avg. per Dept.
US CS Public	29,548	92	321.2	1,019	21	48.5	3,273	17	192.5	33,840	93	363.9
US CS Private	20,487	33	620.8	99	3	33	3,354	7	479.1	23,940	33	725.5
US CS Total	50,035	125	400.3	1,118	24	46.6	6,627	24	276.1	57,780	126	458.6
US CE		0		1,716	5	343.2		0		1,716	5	343.2
US Info	271	2	135.5		0		6,757	13	519.8	7,028	13	540.6
Canadian	2,694	11	244.9	155	1	155	713	2	356.5	3,562	11	323.8
Grand Total	53,000	138	384.1	2,989	30	99.6	14,097	39	361.5	70,086	155	452.2

considerably larger percentage of master's graduates whose gender is unreported (5.3 percent when aggregated across all areas vs 2.6 percent last year, with CE and I having larger percentage differentials than CS), so there is more uncertainty in making year-over-year comparisons this year (Table M2).

Among graduates whose residency and ethnicity is known, the proportion of CS master's degrees that went to Non-resident Aliens recovered 10 percentage points from last year's 15 percentage point drop, and is again at the 60 percent level. All three computing areas showed increases in the Non-resident Alien share of degrees, with the I area's increase being the largest at 25 percentage points. In aggregate across all areas, the increase was from 47.3 to 60.4 percent. The overall percentage of master's recipients among the combined American Indian/Alaska Native, Black/African-American, Native Hawaiian/Pacific Islander, Hispanic, and Multiracial categories dropped to 7.0 percent from 9.3 percent in 2021-22. In CS it dropped from 8.2 to 6.8 percent. White students comprised 18.9 percent of the 2022-23 master's graduates vs 26.7 percent in 2021-22 (Table M3). Interestingly, each area had a smaller percentage of master's graduates of non-reported race/ethnicity this year than it did last year (8.5 percent vs 11.8 percent last year when aggregated across the three computing areas).

As has been the case for several years, a larger proportion of female CS and CE degree recipients than male CS and CE degree recipients were Non-resident Alien, while a larger percentage of male CS and CE degree recipients than female CS and CE degree recipients were White (Table M7). In the I area, Non-resident Aliens again comprised a larger percentage of male master's graduates than female master's graduates, while a smaller percentage of male master's graduates than female master's graduates were

Table M7. Master's Degrees Awarded by Gender and Ethnicity, From 156 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	12,791	5,798	6	56	56.8%	69.7%	31.6%	735	277	0	42	74.5%	85.0%		1,418	1,123	1	167	59.2%	51.8%	50.0%	22,414	60.4%
Amer Indian or Alaska Native	12	4	0	0	0.1%	0.0%	0.0%	0	1	0	0	0.0%	0.3%		2	1	0	0	0.1%	0.0%	0.0%	20	0.1%
Asian	3,299	1,230	7	24	14.7%	14.8%	36.8%	73	25	0	14	7.4%	7.7%		225	217	0	2	9.4%	10.0%	0.0%	5,116	13.8%
Black or African-American	379	137	0	1	1.7%	1.6%	0.0%	11	1	0	0	1.1%	0.3%		102	90	1	1	4.3%	4.1%	50.0%	723	1.9%
Native Hawaiian/ Pac Islander	16	1	0	0	0.1%	0.0%	0.0%	0	1	0	0	0.0%	0.3%		2	1	0	0	0.1%	0.0%	0.0%	21	0.1%
White	4,792	888	3	21	21.3%	10.7%	15.8%	132	14	0	9	13.4%	4.3%		523	594	0	18	21.8%	27.4%	0.0%	6,994	18.9%
Multiracial, not Hispanic	357	95	1	2	1.6%	1.1%	5.3%	18	2	0	2	1.8%	0.6%		56	61	0	0	2.3%	2.8%	0.0%	594	1.6%
Hispanic, any race	872	160	2	9	3.9%	1.9%	10.5%	18	5	0	1	1.8%	1.5%		69	83	0	2	2.9%	3.8%	0.0%	1,221	3.3%
Total Residency & Ethnicity Known	22,518	8,313	19	113				987	326	0	68				2,397	2,170	2	190				37,103	
Resident, ethnicity unknown	541	169	5	73				12	3	0	0				32	29	0	2				866	
Residency unknown	563	196	2	1,431				8	2	0	38				61	58	0	255				2,614	
Gender Totals	23,622	8,678	26	1,617				1,007	331	0	106				2,490	2,257	2	447				40,583	
%	73.1%	26.8%	0.1%					75.3%	24.7%	0.0%					52.4%	47.5%	0.0%						

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

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Table M8. Master's Enrollment by Gender and Ethnicity, From 155 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	21,311	10,171	28	591	68.2%	74.1%	48.3%	1,537	527	0	1	75.3%	86.3%		3,888	3,179	0	2	63.7%	57.2%	0.0%	41,235	68.4%
Amer Indian or Alaska Native	22	6	0	0	0.1%	0.0%	0.0%	0	1	0	0	0.0%	0.2%		7	4	0	0	0.1%	0.1%	0.0%	40	0.1%
Asian	3,432	1,711	7	56	11.0%	12.5%	12.1%	148	37	0	0	7.3%	6.1%		499	536	0	1	8.2%	9.6%	0.0%	6,427	10.7%
Black or African-American	510	291	0	34	1.6%	2.1%	0.0%	25	6	0	0	1.2%	1.0%		224	243	0	1	3.7%	4.4%	0.0%	1,334	2.2%
Native Hawaiian/ Pac Islander	10	4	0	1	0.0%	0.0%	0.0%	0	0	0	0	0.0%	0.0%		7	4	0	0	0.1%	0.1%	0.0%	26	0.0%
White	4,679	1,150	15	165	15.0%	8.4%	25.9%	256	28	0	0	12.5%	4.6%		1,186	1,306	5	17	19.4%	23.5%	100.0%	8,807	14.6%
Multiracial, not Hispanic	321	112	1	19	1.0%	0.8%	1.7%	24	6	0	0	1.2%	1.0%		85	68	0	1	1.4%	1.2%	0.0%	637	1.1%
Hispanic, any race	951	288	7	68	3.0%	2.1%	12.1%	51	6	0	0	2.5%	1.0%		205	217	0	2	3.4%	3.9%	0.0%	1,795	3.0%
Total Residency & Ethnicity Known	31,236	13,733	58	934				2,041	611	0	1				6,101	5,557	5	24				60,301	
Resident, ethnicity unknown	720	258	8	61				21	9	0	0				125	80	0	2				1,284	
Residency unknown	1,813	782	1	3,396				132	19	0	155				561	526	0	1,116				8,501	
Gender Totals	33,769	14,773	67	4,391				2,194	639	0	156				6,787	6,163	5	1,142				70,086	
%	69.5%	30.4%	0.1%					77.4%	22.6%	0.0%					52.4%	47.6%	0.0%						

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

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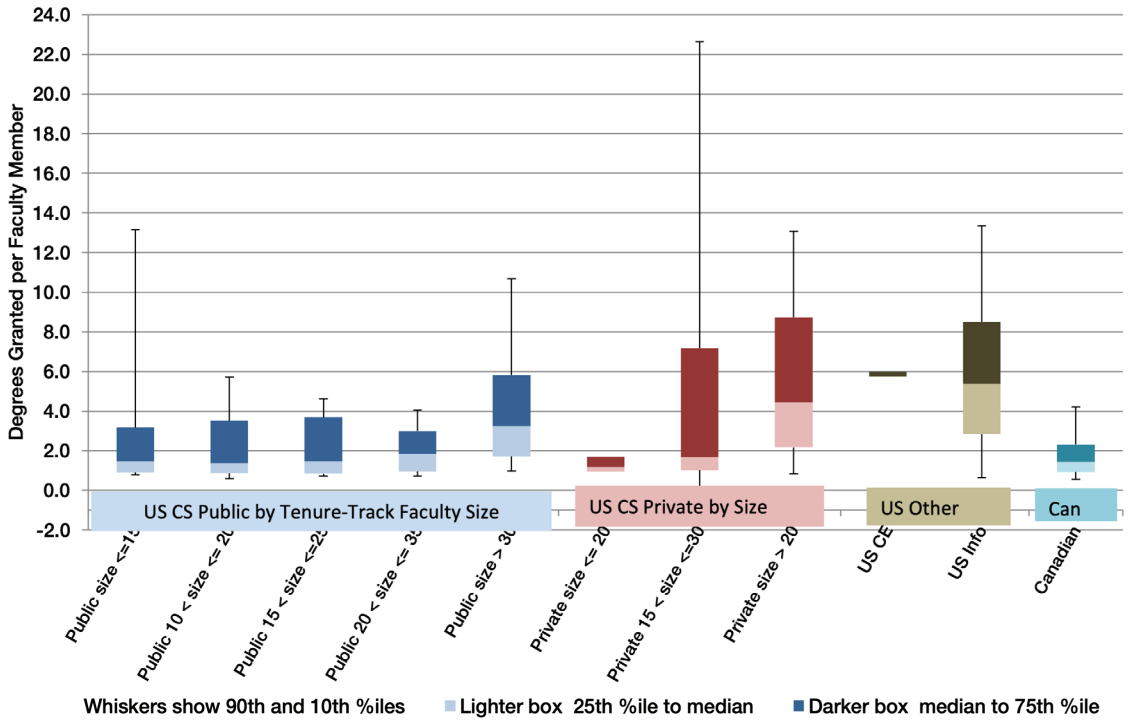
Figure MI. Master's Degrees Granted by Tenure-Track Size

CRA Taulbee Survey 2023



White. These relationships are expected to continue into the near future based on the current enrollment breakdown by gender and ethnicity (Table M8).

It should be noted that, as was the case with the doctoral enrollments, a greater fraction of enrolled master's students reported this year has unknown/unreported gender compared with last year, and likewise with respect to race/ethnicity. Among the 70,086 enrolled master's students among departments reporting for 2022-23, 8.1 percent had unknown/unreported gender, compared with 2.7 percent of the 2021-22 master's students reported last year. The CS and I areas had the large increases in gender, while the I area was the only one with a large increase with respect to race/ethnicity.

The average number of new master's students enrolled in U.S. CS departments rose only slightly this year, from 188.1 to 192.6. Private institutions showed an Increase, while public institutions showed a decrease from last year. The proportion of the new U.S. CS students from outside North America fell from 66.9 to 62.9 percent, with declines in both public and private institutions. The other department types again each experienced increases in the average number of new master's students per department and declines in the proportion of new master's students from outside North America (Table M5).

The record production of master's graduates is not expected to continue this year. The CS area forecasts considerably lower degree production for 2023-24 than it experienced in 2022-23. CE also forecasts lower production while the I area forecasts some increase (Table M4). The total number of new students in 2023-24 is much less than the number of graduates in 2022-23, while overall enrollment for 2022-23 reported by this year's master's programs (Table M6) is similar to that reported in 2021-22 by last year's master's programs (this year's reported enrollment is 0.6 percent less than last year's).

Figure M2. Master's Enrollment Normalized by Tenure-Track Size

CRA Taulbee Survey 2023

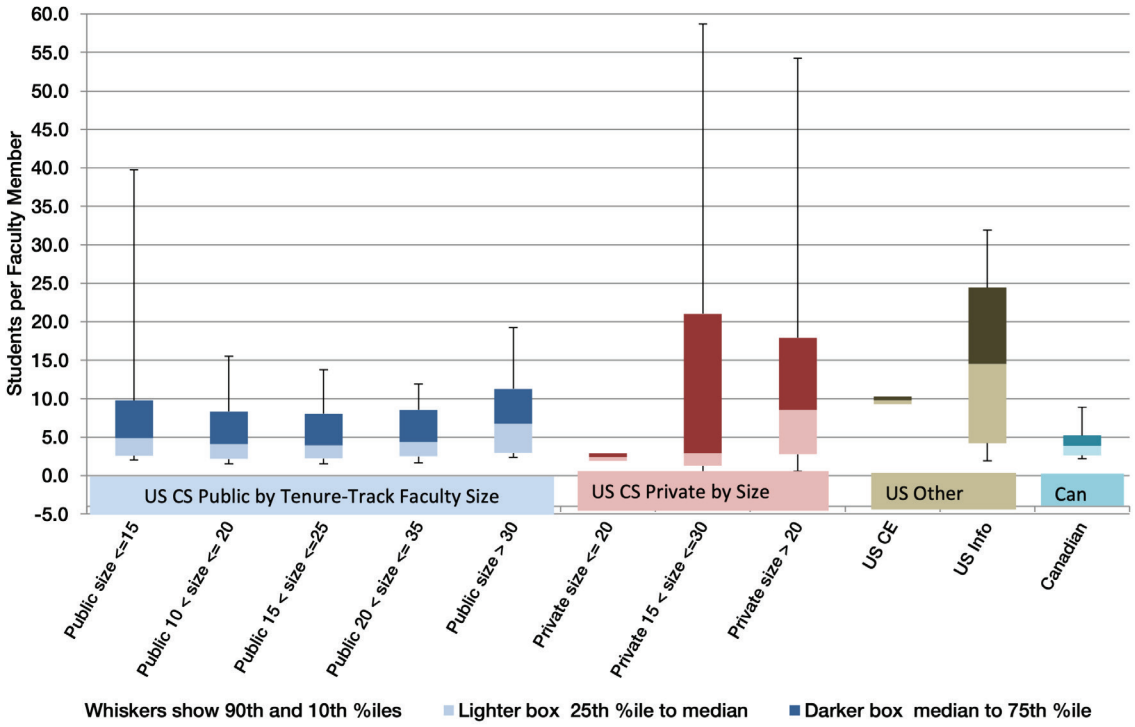


Figure M2 illustrates master's enrollment per tenure-track faculty member for the various department types. In U.S. CS departments at private institutions, larger departments tend to have more master's students per faculty member. The relationship between size and enrollment per faculty member is less clear for public institutions, though the largest sized departments do tend to have the largest enrollments per faculty member.

Bachelor's (Tables 1, B1-B9; Figures B1-B5)

Bachelor's degree production continued its post-COVID period rebound in 2022-23 with a second consecutive year of double-digit increase. Aggregated across all three areas, production was up by 17.6 percent, with CS showing a 23.9 percent increase and CE a 17.1 percent increase. However, production in the I area was down 17.1 percent. U.S. CS departments increased overall production by 21.4 percent, and U.S. CE departments did likewise by 34.6 percent. U.S. I departments had a 6.6 decrease in production and Canadian departments showed flat production with a 0.7 percent decrease. However, when assessing production per department, all department types showed increases compared to last year, at 15.5 percent for U.S. CS, 34.6 percent for U.S. CE, 0.6 percent for U.S. I, and 9.2 percent for Canadian departments (Table B1).

When considering only those departments that reported both years, the increase in total degree production across the CS, CE and I areas was 15.5 percent among all departments and 18.2 percent among U.S. CS departments (Table 1). Both increases are larger than the corresponding increases reported last year.

Figure B1 shows the trend in total CS and CE bachelor's degree production since 1995 for all departments reporting to the Taulbee Survey. Based on department forecasts (Table B4), bachelor's degree production in 2023-24 is expected to fall for the first time in quite a while. However, actual bachelor's degree production tends to exceed departmental projections.

Table B1. Bachelor's Degrees Awarded by Department Type

Department Type	# Depts	CS		CE		I		Total	
US CS Public	93	32,581	73.7%	2,144	63.1%	2,134	40.2%	36,859	69.7%
US CS Private	31	7,455	16.9%	222	6.5%	442	8.3%	8,119	15.3%
US CS Total	124	40,036	90.6%	2,366	69.6%	2,576	48.5%	44,978	85.0%
US CE	5		0.0%	1,031	30.4%		0.0%	1,031	1.9%
US Info	13	425	1.0%		0.0%	2,739	51.5%	3,164	6.0%
Canadian	10	3,737	8.5%		0.0%		0.0%	3,737	7.1%
Grand Total	152	44,198		3,397		5,315		52,910	

Table B2. Bachelor's Degrees Awarded by Gender

	CS		CE		I		Total	
Male	31,668	77.3%	2,427	81.2%	3,347	67.4%	37,442	76.6%
Female	9,225	22.5%	553	18.5%	1,613	32.5%	11,391	23.3%
Nonbinary/Other	50	0.1%	9	0.3%	3	0.1%	62	0.1%
Total Known Gender	40,943		2,989		4,963		48,895	
Gender Unknown	3,255		408		352		4,015	
Grand Total	44,198		3,397		5,315		52,910	

Table B3. Bachelor's Degrees Awarded by Ethnicity

	CS		CE		I		Total	
Nonresident Alien	5,219	14.7%	418	12.8%	611	11.9%	6,248	14.3%
Amer Indian or Alaska Native	55	0.2%	4	0.1%	9	0.2%	68	0.2%
Asian	11,397	32.2%	1,031	31.7%	1,104	21.5%	13,532	30.9%
Black or African-American	1,377	3.9%	110	3.4%	359	7.0%	1,846	4.2%
Native Hawaiian/Pac Islander	52	0.1%	3	0.1%	39	0.8%	94	0.2%
White	12,924	36.5%	1,278	39.3%	2,220	43.2%	16,422	37.5%
Multiracial, not Hispanic	1,189	3.4%	114	3.5%	201	3.9%	1,504	3.4%
Hispanic, any race	3,209	9.1%	296	9.1%	600	11.7%	4,105	9.4%
Total Residency & Ethnicity Known	35,422		3,254		5,143		43,819	
Resident, ethnicity unknown	1,707		80		113		1,900	
Residency unknown	7,069		63		59		7,191	
Grand Total	44,198		3,397		5,315		52,910	

Figure B3 shows bachelor's degrees granted normalized by department tenure-track faculty size. In U.S. CS departments at private institutions, larger departments produce fewer degrees per tenure-track faculty member than do smaller departments. The largest departments at U.S. CS departments at public institutions tend to produce the most bachelor's degrees per tenure-track faculty member, but the relationship is less clear for departments of size below 25.

Gender diversity among bachelor's graduates was somewhat higher in 2022-23 than in 2021-22, though in each area there are many more graduates whose gender was not reported compared with last year. CS had the smallest percentage increase in non-reported

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

Department Type	# Depts	CS		CE		I		Total	
US CS Public	89	27,043	68.7%	1,959	59.4%	1,582	31.7%	30,584	64.2%
US CS Private	27	7,369	18.7%	114	3.5%	440	8.8%	7,923	16.6%
US CS Total	116	34,412	87.5%	2,073	62.9%	2,022	40.5%	38,507	80.8%
US CE	5	0	0.0%	1,055	32.0%	0	0.0%	1,055	2.2%
US Info	13	481	1.2%		0.0%	2,971	59.5%	3,452	7.2%
Canadian	8	4,456	11.3%	168	5.1%		0.0%	4,624	9.7%
Grand Total	142	39,349		3,296		4,993		47,638	

Table B5. New Bachelor's Students by Department Type

	CS				CE				I				Total	
Department Type	Major	Pre-Major	# Depts	Avg. Major /Dept	Total	Pre-Major	# Depts	Avg. Major /Dept	Total	Pre-Major	# Depts	Avg. Major /Dept	Total Major	Avg. Major /Dept
US CS Public	29,867	13,058	84	355.6	2,425	1,774	29	83.6	2,040	136	23	88.7	34,332	403.9
US CS Private	9,044	2,795	26	347.8	186	30	7	26.6	431	28	4	107.8	9,661	371.6
US CS Total	38,911	15,853	110	353.7	2,611	1,804	36	72.5	2,471	164	27	91.5	43,993	396.3
US CE			0		1,055	0	3	351.7			0		1,055	351.7
US Info	404	306	2	202			0		1,830	570	13	140.8	2,234	171.8
Canadian	4,495	781	9	499.4	223		1	223			0		4,718	524.2
Grand Total	43,810	16,940	121	362.1	3,889	1,804	40	97.2	4,301	734	40	107.5	52,000	382.4

Table B6. Total Bachelor's Enrollment by Department Type

	CS				CE				I				Total	
Department Type	Major	Pre-Major	# Depts	Avg. Major / Dept	Total	Pre-Major	# Depts	Avg. Major /Dept	Total	Pre-Major	# Dept	Avg. Major /Dept	Total Major	Avg. Major / Dept
US CS Public	131,233	24,274	92	1,426.4	10,104	3,015	32	315.8	9,958	1,093	24	414.9	151,295	1,626.8
US CS Private	28,547	4,010	30	951.6	763	48	8	95.4	2,368	29	5	473.6	31,678	1,055.9
US CS Total	159,780	28,284	122	1,309.7	10,867	3,063	40	271.7	12,326	1,122	29	425	182,973	1,487.6
US CE		0	0		3,875	46	5	775		0	0		3,875	775.0
US Info	1,730	387	2	865.0			0		9,095	1,028	13	699.6	10,825	832.7
Canadian	19,312	2,073	10	1,931.2	1,013	1,013	1	1013	2,370		1	2370	22,695	2,269.5
Grand Total	180,822	30,744	134	1,349.4	15,755	4,122	46	342.5	23,791	2,150	43	553.3	220,368	1,459.4

gender, going from 4.1 to 7.4 percent. Among graduates whose gender was reported, 23.3 percent were female in aggregate across all disciplines compared with 22.7 percent in 2021-22, while CS had 22.5 percent female vs 22.2 percent in 2021-22. The largest increase was in the I area, which went from 27.8 to 32.5 percent female graduates (Table B2).

The percentage of bachelor's graduates who are White decreased in each area. The percentage of degrees awarded to Non-resident Aliens increased slightly in aggregate and in all areas except CS, while the percentage awarded to Asians increased in aggregate and in all areas except I. All other ethnicities combined comprise 17.4 percent of those for whom ethnicity is known across the three areas combined, down from 17.8 percent reported last year and equal to the level reported two years ago. CE was the only area

to experience a decrease across these other ethnicities, with CS and I staying the same as last year. Unreported race/ethnicity was similar in CS to that of last year, while in CE and I there was a sizeable decline this year in the percentage of graduates of unreported race/ethnicity (Table B3).

The 2023-24 cohort brought mixed news relative to changes in new undergraduate majors. In CS, the average number of new undergraduate majors per department increased 6.2 percent, from 341.0 to 362.1. However, the average number of CE and I majors per department decreased 3.8 and 13.9 percent respectively. In aggregate across all three areas, U.S. CS departments reported an increase in new majors per department of 3.4 percent, U.S. CE departments increased by 28.5 percent and Canadian departments increased by 9.5 percent, while U.S. I departments decreased by 8.8 percent. Within the U.S. CS departments, those in private institutions had an 11.4 percent increase, while the increase among those in public institutions was just 1.6 percent. The overall increase in new majors per department aggregated across all department types and all areas was 3.9 percent (Table B5). Table 1 provides year-over-year comparisons based on the total number of new reported majors, without regard to the number of departments that reported. It shows a 9.5 percent increase in total new reported majors across all department types, and a 12.6 percent increase among U.S. CS departments.

When only departments reporting both this year and last year are considered, the count of new majors increased by 7.3 percent across all departments, and 9.5 percent at U.S. CS departments. This is the third consecutive year of such increases (Table 1). Figure B2 illustrates the trend in the total number of newly declared computing undergraduate majors as reported in the Taulbee Survey.

Total reported enrollment in the major also exhibited continued growth in CS and when aggregated across all three areas. Aggregate enrollment in the major across all three computing areas increased 4.4 percent when all departments are considered and 6.2 percent when only U.S. CS departments are considered. When normalized for the number of departments reporting, the corresponding increases are 4.4 percent and 2.7 percent (Table 1). Total reported enrollment in the CS major, aggregated across all department types, increased 7.5 percent. When normalized for the number of departments reporting, the average number of CS majors per department increased 5.1 percent. All department types exhibited increases in the average number of CS majors per department (Table B6).

In the I area, however, enrollment decreased in 2022-23. Total enrollment fell 10.0 percent, while the average number of I majors per reporting department fell 3.7 percent. The average per department was strongly influenced by the inclusion this year of a large Canadian department. When U.S. I departments alone are considered, the average number of I majors per department dropped by 9.9 percent.

In CE, total reported enrollment increased 4.1 percent, but the average number of majors per department decreased by 2.7 percent. The CE values also are more strongly influenced by changes in the specific departments reporting from year to year.

Figure B4 shows total enrollment per tenure-track faculty member for the various department types. In U.S. CS departments at private institutions, the larger departments have a lower enrollment per faculty member, while at public institutions, there is no clear relationship between enrollment per tenure-track faculty member and faculty size. The same observation was made last year.

Figure B5 shows the enrollment trend in U.S. CS departments from Taulbee Survey data since this surge began. It illustrates both the relatively flat number of average new majors per department from 2018 through 2021 followed by renewed growth in average new majors during the past two years, and the sixteen consecutive years of growth in average total majors per department through academic year 2022-23. The average enrollment per U.S. CS department has increased to more than six times its level in fall 2006. For the past decade, it has exceeded the previous peak of about 400, reached during the dot-com enrollment surge. Currently, it is more than three times that peak.

The fraction of the total CS bachelor's enrollment in 2022-23 that is female increased from 22.5 percent to 23.1 percent of those whose gender was known. The percentage also increased for I enrollment, from 27.5 to 29.5, but decreased in CE from 18.6 to 17.3

Table B7. Bachelor's Degrees Awarded by Gender and Ethnicity, From 152 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	3,760	1,258	3	198	13.8%	16.6%	6.8%	227	44	1	146	9.8%	8.2%	12.5%	334	177	0	100	10.2%	11.3%	0	6,248	14.3%
Amer Indian or Alaska Native	41	12	0	2	0.2%	0.2%	0.0%	4	0	0	0	0.2%	0.0%	0.0%	2	7	0	0	0.1%	0.4%	0	68	0.2%
Asian	8,298	3,013	16	70	30.4%	39.7%	36.4%	674	213	3	141	29.1%	39.5%	37.5%	636	451	0	17	19.4%	28.8%	0	13,532	30.9%
Black or African-American	1,003	347	1	26	3.7%	4.6%	2.3%	80	25	0	5	3.5%	4.6%	0.0%	228	111	0	20	7.0%	7.1%	0	1,846	4.2%
Native Hawaiian/ Pac Islander	39	10	1	2	0.1%	0.1%	2.3%	2	1	0	0	0.1%	0.2%	0.0%	25	13	0	1	0.8%	0.8%	0	94	0.2%
White	10,635	2,131	19	139	39.0%	28.1%	43.2%	1,014	181	4	79	43.8%	33.6%	50.0%	1,544	591	3	82	47.2%	37.7%	1	16,422	37.5%
Multiracial, not Hispanic	923	263	0	3	3.4%	3.5%	0.0%	87	17	0	10	3.8%	3.2%	0.0%	120	72	0	9	3.7%	4.6%	0	1,504	3.4%
Hispanic, any race	2,594	553	4	58	9.5%	7.3%	9.1%	225	58	0	13	9.7%	10.8%	0.0%	382	144	0	74	11.7%	9.2%	0	4,105	9.4%
Total Residency & Ethnicity Known	27,293	7,587	44	498				2,313	539	8	394				3,271	1,566	3	303				43,819	
Resident, ethnicity unknown	1,054	379	1	273				67	9	1	3				65	44	0	4				1,900	
Residency unknown	3,321	1,259	5	2,484				47	5	0	11				11	3	0	45				7,191	
Gender Totals	31,668	9,225	50	3,255				2,427	553	9	408				3,347	1,613	3	352				52,910	
%	77.3%	22.5%	0.1%					81.2%	18.5%	0.3%					67.4%	32.5%	0.1%						

* % of M, % of F, and % of N 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 151 Departments

	CS							CE							I							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	13,271	4,269	6	299	12.2%	13.2%	3.0%	991	226	1	0	9.5%	10.2%	3.2%	1,146	544	1	40	8.6%	9.9%	5.6%	20,794	11.6%
Amer Indian or Alaska Native	238	76	0	18	0.2%	0.2%	0.0%	12	2	0	0	0.1%	0.1%	0.0%	25	11	0	2	0.2%	0.2%	0.0%	384	0.2%
Asian	30,994	11,667	56	996	28.5%	36.1%	27.6%	2,824	756	14	0	27.0%	34.2%	45.2%	2,604	1,656	5	218	19.5%	30.3%	27.8%	51,790	28.9%
Black or African-American	6,384	2,575	11	331	5.9%	8.0%	5.4%	627	173	1	0	6.0%	7.8%	3.2%	1,182	548	0	171	8.9%	10.0%	0.0%	12,003	6.7%
Native Hawaiian/ Pac Islander	101	31	0	6	0.1%	0.1%	0.0%	7	2	0	0	0.1%	0.1%	0.0%	12	4	0	2	0.1%	0.1%	0.0%	165	0.1%
White	39,837	8,591	105	1,954	36.6%	26.6%	51.7%	4,183	628	11	1	40.0%	28.4%	35.5%	5,921	1,853	6	475	44.3%	33.9%	33.3%	63,565	35.4%
Multiracial, not Hispanic	4,395	1,254	3	297	4.0%	3.9%	1.5%	403	95	1	1	3.9%	4.3%	3.2%	589	226	2	73	4.4%	4.1%	11.1%	7,339	4.1%
Hispanic, any race	13,583	3,849	22	1,214	12.5%	11.9%	10.8%	1,417	331	3	1	13.5%	15.0%	9.7%	1,876	630	4	405	14.0%	11.5%	22.2%	23,335	13.0%
Total Residency & Ethnicity Known	108,803	32,312	203	5,115				10,464	2,213	31	3				13,355	5,472	18	1,386				179,375	
Resident, ethnicity unknown	2,855	1,018	15	124				308	76	5	4				203	109	0	24				4,741	
Residency unknown	12,952	4,392	671	12,362				1,314	253	5	1,079				424	273	0	2,527				36,252	
Gender Totals	124,610	37,722	889	17,601				12,086	2,542	41	1,086				13,982	5,854	18	3,937				220,368	
%	76.3%	23.1%	0.5%					82.4%	17.3%	0.3%					70.4%	29.5%	0.1%						

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

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Table B9. Undergraduate Representative Course Enrollments 2019-2022, Department-Level Percentiles

Intro for Non-Majors																			
Number of Students in Course					% of Students Who Are Majors					% of Students Who Are Female					% of Students Who Are BHN				
(N=49)	2020	2021	2022	2023	(N=39)	2020	2021	2022	2023	(N=31)	2020	2021	2022	2023	(N=26)	2020	2021	2022	2023
25	91	106	104	96	25	0.0	0.0	.0.3	0.2	25	25.2	25.6	26.9	28.4	25	15.3	16.7	15.5	17.0
50	195	168	166	205	50	1.6	3.9	1.9	1.7	50	40.5	35.7	42.5	40.5	50	23.2	22.5	26.2	27.3
75	530	370	342	435	75	9.7	16.3	11.8	12.5	75	46.8	52.1	52.6	47.5	75	36.5	38.2	32.9	38.6
Intro for Majors																			
Number of Students in Course					% of Students Who Are Majors					% of Students Who Are Female					% of Students Who Are BHN				
(N=60)	2020	2021	2022	2023	(N=47)	2020	2021	2022	2023	(N=36)	2020	2021	2022	2023	(N=31)	2020	2021	2022	2023
25	156	182	144	164	25	28.0	35.1	38.9	33.8	25	18.3	18.3	18.8	21.5	25	12.4	14.6	14.8	15.9
50	322	286	304	284	50	51.0	51.8	59.5	59.8	50	22.5	24.9	24.7	24.8	50	21.3	24.5	23.6	25.1
75	573	568	617	645	75	69.7	74.2	73.3	78.1	75	26.8	30.4	30.9	30.2	75	30.4	37.1	37.1	40.1
Mid-Level																			
Number of Students in Course					% of Students Who Are Majors					% of Students Who Are Female					% of Students Who Are BHN				
(N=58)	2020	2021	2022	2023	(N=45)	2020	2021	2022	2023	(N=34)	2020	2021	2022	2023	(N=29)	2020	2021	2022	2023
25	129	127	130	147	25	51.6	53.6	57.5	57.0	25	16.2	14.8	18.8	17.7	25	12.4	11.9	14.1	13.3
50	182	185	174	210	50	69.4	75.4	70.6	75.5	50	20.2	21.0	20.9	22.6	50	18.3	17.8	22.4	26.4
75	321	284	321	311	75	90.6	90.2	88.8	88.4	75	24.8	24.8	25.5	26.7	75	27.2	31.5	36.1	36.1
Upper Level																			
Number of Students in Course					% of Students Who Are Majors					% of Students Who Are Female					% of Students Who Are BHN				
(N=59)	2020	2021	2022	2023	(N=46)	2020	2021	2022	2023	(N=37)	2020	2021	2022	2023	(N=32)	2020	2021	2022	2023
25	71	90	81	86	25	70.6	71.9	69.8	77.2	25	13.7	15.3	14.4	16.0	25	11.4	10.1	11.5	10.4
50	140	131	132	156	50	82.7	87.1	89.7	89.8	50	17.6	18.8	17.6	22.2	50	16.9	16.9	17.8	17.2
75	261	228	282	302	75	97.2	97.9	97.4	98.6	75	22.2	23.3	23.3	25.2	75	26.2	30.0	29.8	29.3

percent. With respect to racial/ethnic diversity, the fraction of total 2022-23 enrollment aggregated across all three computing areas, among races/ethnicities other than Non-resident Alien, Asian and White, is 24.1 percent. Last year it was 23.1 percent. In CS, these other races/ethnicities comprised 23.7 percent of total enrollment versus 22.5 percent reported last year (Table B8). The CE and I areas each had large increases in unreported gender and unreported race/ethnicity compared with last year, while the CS area had a large increase in unreported gender but had a comparable level of unreported race/ethnicity as last year.

In all three computing areas, Resident Asians and Non-resident Aliens continue to comprise a larger fraction of female enrollment than male enrollment, while a larger fraction of male enrollment than female enrollment is White (Table B8). Table B7 indicates that the same comparisons again hold true for degree awardees in CS and I; Non-resident Aliens comprise a larger fraction of male than female CE awardees.

The Taulbee Survey also has been viewing enrollment using selected CS course level data. Such data was first reported in CRA's Generation-CS report for the fall terms in 2005, 2010 and 2015. The Taulbee Survey began collecting follow-up data in the 2016 survey, and now does so annually. Table B9 provides rolling four-year enrollment trends in four types of departmental courses: an introductory course for non-majors, an introductory course for majors, an intermediate level course, and an upper-level course. Departments select an appropriate course at their institution in each category; they are asked to provide the total enrollment in each of these courses, and the percentage enrollment within the course for majors and specific gender and race/ethnicity categories. The number of departments (N) reporting each type of data is indicated in parentheses. The table shows the quartile values for the data reported by these departments. Only departments that reported the particular course data in all four of the years are included in the computations. Thus, a given year's tables can have different numbers of departments for each statistic at a given course level, and the quartile entries for a given year may not match their counterpart entry from a previous year since some of the departments contributing to that year's data may have changed.

Again this year, median enrollments increased each year of the four-year period only for mid-level courses. The most recent year (2023) had the highest median enrollment among the four years in the intro course for the non-major major as well as the mid-level and upper-level courses, but unlike last year, not for the intro course for the major. The median percent of students who are majors increased uniformly during the four-year period in the intro course for the major and the upper-level course, and is at its highest level in 2023 for the mid-level course. Median gender diversity showed no uniform change across the four years but was at its highest level in 2023 in the mid-level and upper-level courses. Racial/ethnicity diversity also showed no uniform increase across the four years but was at its highest level in 2023 for all courses except the upper-level course.

Figure B1. BS Production (CS & CE)

CRA Taulbee Survey 2023

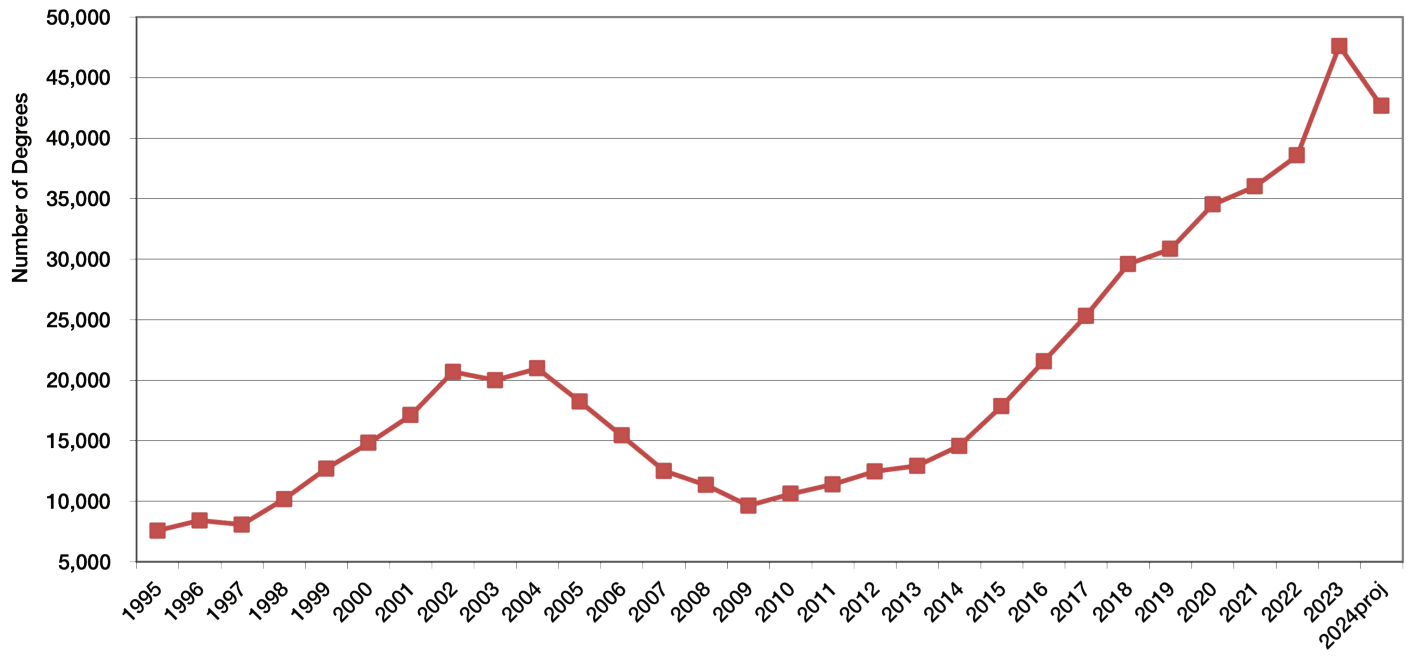


Figure B2. Newly Declared Undergraduate Majors: CS, CE, and I (beginning in 2008)

CRA Taulbee Survey 2023

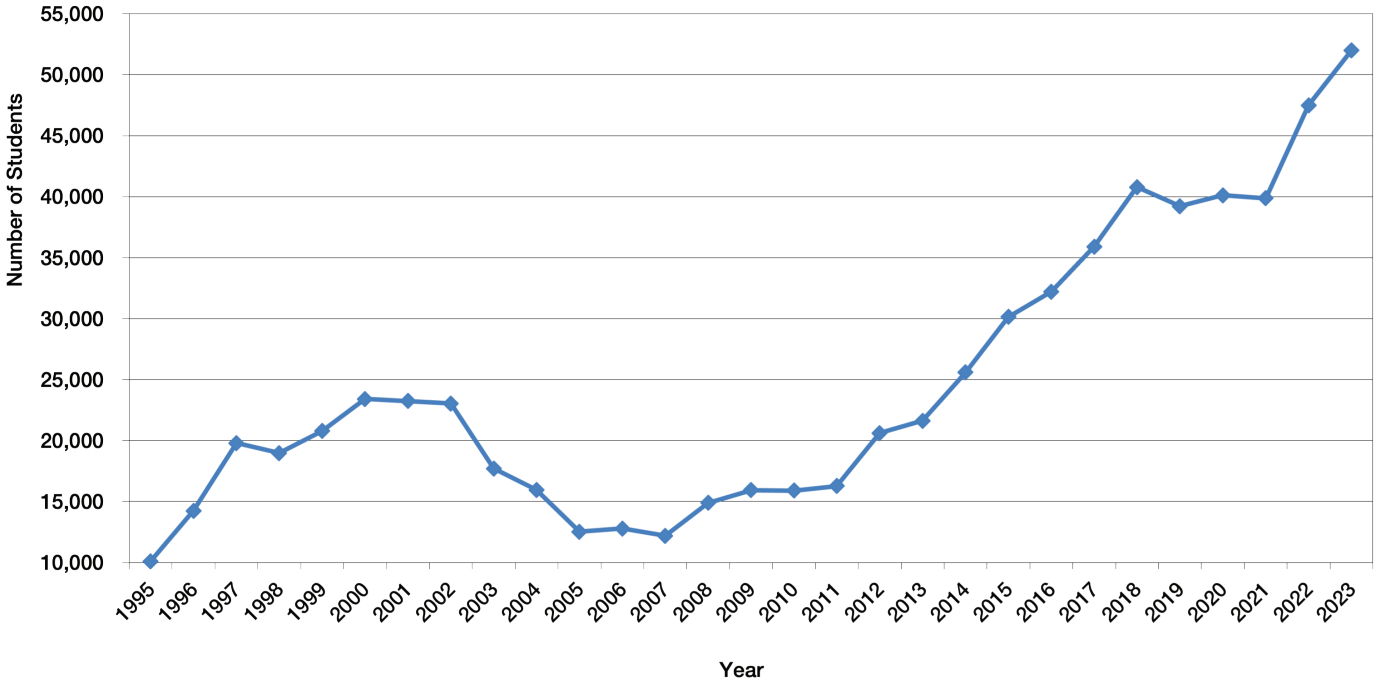


Figure B3. Bachelor's Degrees Granted by Tenure-Track Size

CRA Taulbee Survey 2023

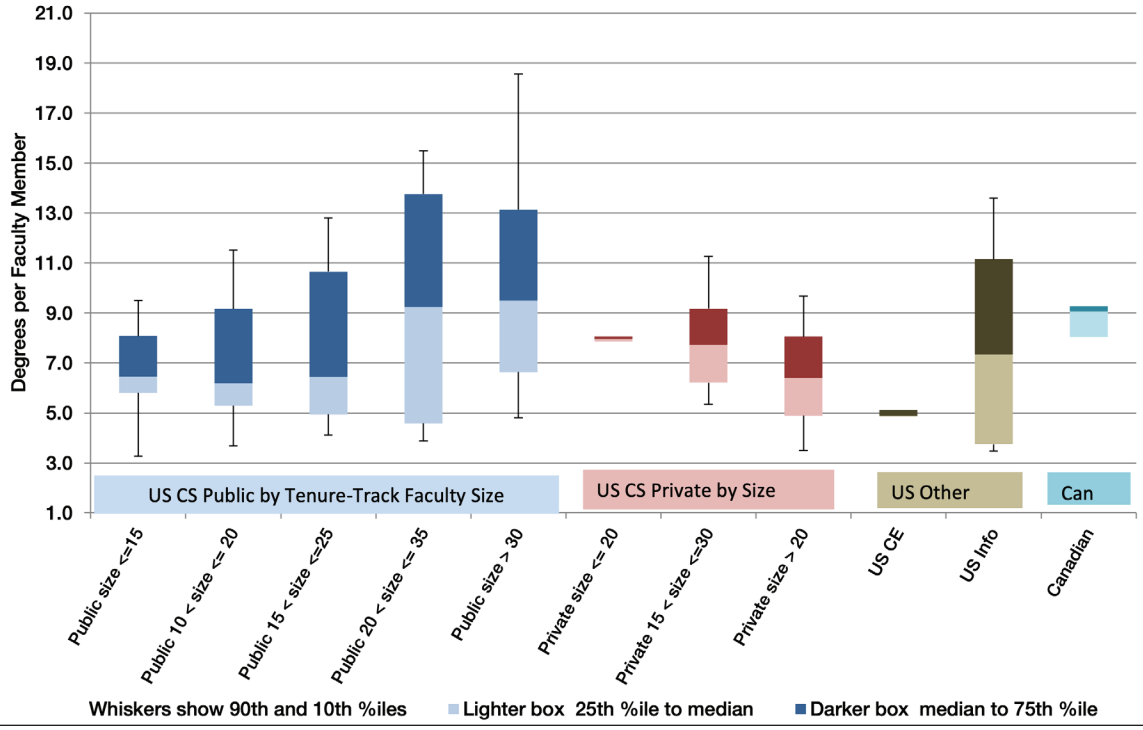


Figure B4. Bachelor's Enrollment Normalized by Tenure-Track Size

CRA Taulbee Survey 2023

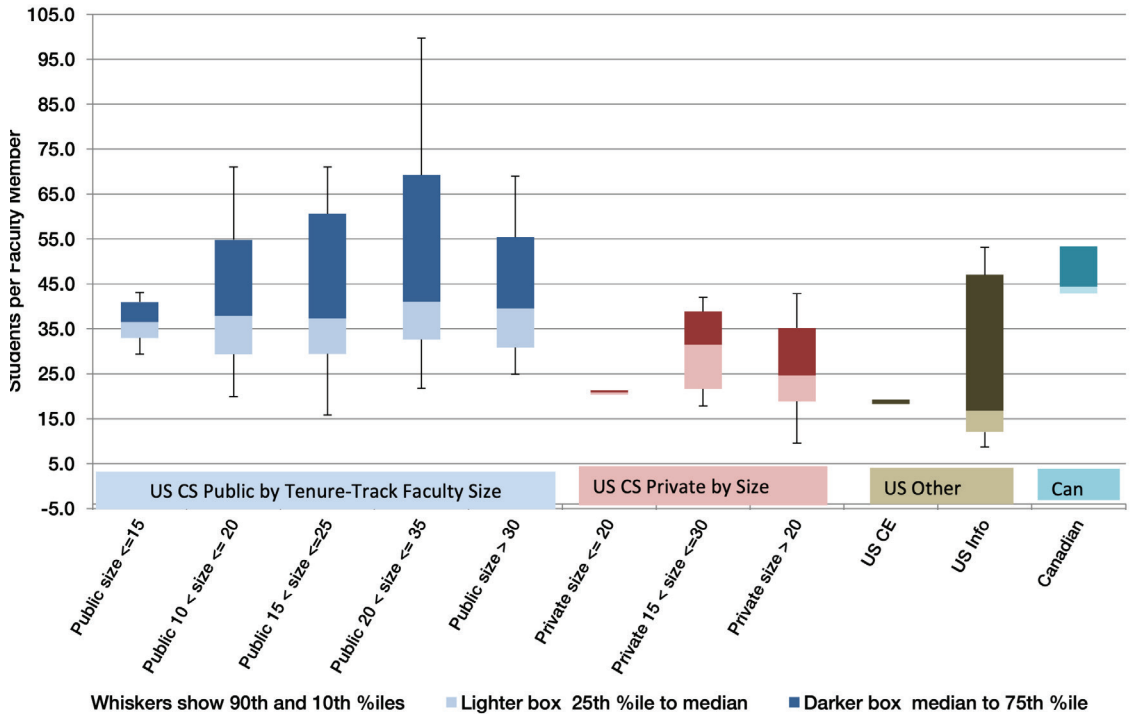
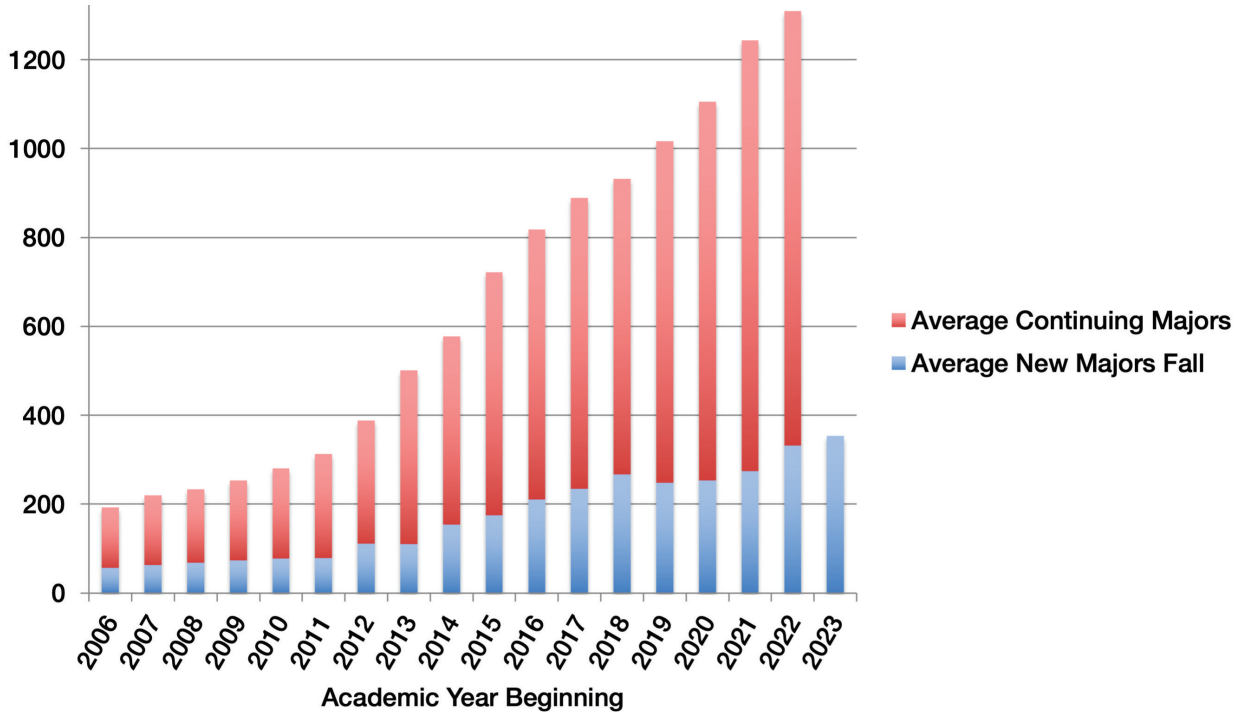


Figure B5. Average New and Continuing CS Majors per Academic Unit (U.S. CS Programs Only)

CRA Taulbee Survey 2023



Student Disability and Socioeconomic Data (Table 2)

Beginning with the 2021 Taulbee Survey we obtained information about the number of students at each degree level who received accommodations for disabilities during the past academic year, the number of undergraduate students who were first-generation college students, and the number who were recipients of Pell grants. We obtained this information again this year. This year, we had a few more departmental responses for disability information at the bachelor's and master's level, and a few less at the doctoral level. We also had a few more reporting about first-generation status and Pell grants (Table 2).

The table indicates that roughly 3/5 of the reporting departments showed no graduate students receiving disability accommodations, and that the average reporting department has between 1 and 2 percent of its graduate students receiving accommodations at both the master's and doctoral levels. The doctoral percentage is slightly higher than that reported last year, while the master's percentage is slightly lower. At the undergraduate level, 3.4 percent of the undergraduate majors receive disability accommodations at those departments that provided data about accommodations; last year, this percentage was 4.1.

In those departments reporting information about Pell grants and first-generation status, 23.4 percent of their undergraduate students are known to be receiving Pell grants, and 21.0 percent are first-generation college students. Last year, the percentages were 20.9 and 23.7, respectively. For the 65 departments reporting Pell grant information, the table disaggregates them into departments at public and private institutions. Departments at public institutions report a somewhat higher percentage of Pell grant students than do departments at private institutions; the same was true last year, though both percentages this year are higher than their corresponding percentages reported last year.

Faculty Demographics (Tables F1-F10; Figure F1)[4]

Table F1 shows the current (2023-24) and future anticipated sizes, in FTE, for tenure-track, teaching, and research faculty, and postdocs. Teaching faculty are separately reported in subcategories called "Teaching Professors" and "Other Instructors". "Teaching Professors"

Table 2. Students With Disability Accommodations, Pell Grants, and First Generation Status (was Table Prof29 in previous year's report)

	Number of Depts	Total Enrollment	Total With Accommodations	Percent of Enrollment With Accommodations	Percent of Depts Reporting Zero Accommodations	Max Dept Percent of Accommodations	Average Number of Students With Accommodations
PhD	77	11,245	145	1.3%	60%	11%	1.9
Masters	73	35,927	439	1.2%	62%	10%	6.0
Bachelors	60	94,439	3244	3.4%	40%	22%	54.1
	Number of Depts	**Total Enrollment**	**Total With That Status**	**Percent of Enrollment With Status**			
Pell Grant	65	103,225	24,160	23.4%	[Overall per NCES 32.1%]		
First Generation	82	122,903	25,801	21.0%			
		% Pell from Taulbee		**% Pell NCES, Dependent Student***	**%Pell NCES, Independent Student***		
Pell Grant, US Public	55	23.3%		41.5%	25.4%		
Pell Grant, US Private	10	19.3%		14.3%	12.2%		

* Source of NCES Pell Data, Federal Pell Grant Program of the Higher Education Act: Primer, Congressional Research Service, Updated Jan. 24, 2023.
* This is the same source of comparison data used in the 2022 Taulbee report, so the comparison numbers are unchanged.
* Pell grant numbers are for US institutions only; the total and the public/private split include all US academic units

2023 Taulbee Survey *(continued)*

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

	Actual		Projected				Expected 2-Yr Growth		# Depts	
	2023-24		2024-25		2025-26					
US CS Public	Total	Average	Total	Average	Total	Average	#	%		
TenureTrack	3,388	35.7	3,625	38.2	3,761	39.6	373	11.0%	95	
Teaching Professors	731	7.7	809	8.5	866	9.1	135	18.5%	80	
Other Instructors	680	7.2	717	7.6	736	7.8	56	8.2%	69	
Research	164	1.7	178	1.9	193	2	29	17.7%	31	
Postdoc	220	2.3	249	2.6	272	2.9	52	23.6%	40	
Total	5,182	54.5	5,578	58.7	5,828	61.4	646	12.5%		
US CS Private										
TenureTrack	1,481	42.3	1,563	44.7	1,618	46.2	137	9.3%	35	
Teaching Professors	352	10.1	368	10.5	387	11	35	9.9%	30	
Other Instructors	214	6.1	229	6.5	241	6.9	27	12.6%	22	
Research	100	2.8	105	3	107	3.1	7	7.0%	12	
Postdoc	219	6.3	230	6.6	243	6.9	24	11.0%	16	
Total	2,365	67.6	2,495	71.3	2,595	74.1	230	9.7%		
US CS Total										
TenureTrack	4,868	37.4	5,188	39.9	5,379	41.4	511	10.5%	130	
Teaching Professors	1,083	8.3	1,177	9.1	1,252	9.6	169	15.6%	110	
Other Instructors	893	6.9	946	7.3	977	7.5	84	9.4%	91	
Research	263	2	283	2.2	300	2.3	37	14.1%	43	
Postdoc	439	3.4	479	3.7	515	4	76	17.3%	56	
Total	7,547	58.1	8,073	62.1	8,423	64.8	876	11.6%		
US CE										
TenureTrack	249	49.8	255	51	260	52	11	4.4%	5	
Teaching Professors	28	5.6	31	6.2	32	6.4	4	14.3%	5	
Other Instructors	1	0.2	1	0.2	1	0.2	0	0.0%	1	
Research	22	4.4	24	4.8	25	5	3	13.6%	1	
Postdoc	24	4.8	26	5.2	27	5.4	3	12.5%	2	
Total	324	64.8	337	67.4	345	69	21	6.5%		
US Info										
TenureTrack	419	32.2	444	34.1	459	35.3	40	9.5%	13	
Teaching Professors	197	15.1	215	16.5	223	17.1	26	13.2%	13	
Other Instructors	111	8.6	109	8.4	101	7.8	-10	-9.0%	9	
Research	8	0.6	6	0.5	8	0.6	0	0.0%	5	
Postdoc	27	2.1	37	2.8	39	3	12	44.4%	9	
Total	762	58.6	811	62.4	829	63.8	67	8.8%		
Canadian										
TenureTrack	422	42.2	450	45	462	46.2	40	9.5%	10	
Teaching Professors	63	6.3	67	6.7	68	6.8	5	7.9%	6	
Other Instructors	56	5.6	55	5.5	56	5.6	0	0.0%	7	
Research	4	0.4	5	0.5	6	0.6	2	50.0%	1	
Postdoc	61	6.1	63	6.3	63	6.3	2	3.3%	4	
Total	606	60.6	640	64	655	65.5	49	8.1%		
Grand Total										
TenureTrack	5,959	37.7	6,337	40.1	6,560	41.5	601	10.1%	158	
Teaching Professors	1,370	8.7	1,490	9.4	1,575	10	205	15.0%	134	
Other Instructors	1,062	6.7	1,111	7	1,135	7.2	73	6.9%	108	
Research	297	1.9	318	2	339	2.1	42	14.1%	50	
Postdoc	551	3.5	605	3.8	644	4.1	93	16.9%	71	
Total	9,239	58.5	9,861	62.4	10,253	64.9	1,014	11.0%		

on average have more varied responsibilities in teaching, scholarship, service/governance, etc., and higher expectations for visibility outside the unit or the institution. "Other Instructors" are more focused on teaching introductory or mid-level courses and tend to have shorter contract lengths, though they are still full-time faculty (the Taulbee Survey does not collect data on course-by-course adjuncts other than typical stipends per course; see the section on faculty salaries).

The righthand column of Table F1 shows, for each row, the number of departments that provided non-zero values for actual 2023-24 faculty in the particular category. Entries for averages per department are reported based on the number of departments that provided tenure-track faculty information, not on the number of departments that had at least one person reported in the faculty category. For the tenure-track faculty rows, these computations are the same. This has been the historical way the averages have been reported in this table.

The average tenure-track faculty size in U.S. CS departments increased by 2.8 percent over last year, with the increase almost exclusively in departments at private institutions, where the increase was 10.2 percent. The increase at U.S. CS departments at public institutions was only 0.4 percent. With respect to teaching faculty in U.S. CS departments, the average number of Teaching Professors per department increased by 12.2 percent, while the average number of Other Instructors increased by 20.0 percent. The increase for Teaching Professors also was dominated by departments at private institutions (25.4 percent vs. 8.0 percent at public institutions), while the increase for Other Instructors was more balanced (22.0 percent at private institutions and 18.9 percent at public institutions).

U.S. CS departments in private institutions have slightly more total teaching faculty on average than do U.S. CS departments in public institutions. They have more Teaching Professors and fewer Other Instructors per department than do U.S. departments in public institutions. However, U.S. CS departments in both public and private institutions report a larger average number of Teaching Professors than Other Instructors. U.S. CE, U.S. I, and Canadian departments also reported a greater average number of Teaching Professors than Other Instructors per department, as they did last year.

The average number of research faculty and postdocs at U.S. CS departments each decreased in 2023-24, by 12.0 and 3.9 percent, respectively. Last year, both categories showed increases over

Table F2. Vacant Positions 2022-23 by Position and Department Type

	Tried to fill	Filled
US CS Public		
TenureTrack	371	267
Teaching Professors	135	114
Other Instructors	55	63
Research	29	32
Postdoc	71	79
Total	661	555
US CS Private		
TenureTrack	130	117
Teaching Professors	45	42
Other Instructors	19	18
Research	12	12
Postdoc	31	33
Total	237	222
US CS Total		
TenureTrack	501	384
Teaching Professors	180	156
Other Instructors	74	81
Research	41	44
Postdoc	102	112
Total	898	776
US CE		
TenureTrack	13	13
Teaching Professors	3	4
Other Instructors	0	1
Research	0	1
Postdoc	1	1
Total	17	20
US Info		
TenureTrack	27	22
Teaching Professors	33	26
Other Instructors	4	5
Research	1	1
Postdoc	13	12
Total	78	66
Canadian		
TenureTrack	59	33
Teaching Professors	14	12
Other Instructors	4	3
Research	1	1
Postdoc	18	52
Total	96	101
Grand Total		
TenureTrack	600	452
Teaching Professors	230	198
Other Instructors	82	90
Research	43	47
Postdoc	134	177
Total	1,089	963

the previous year. This year, public institutions had an increase in the postdoc average, while private institutions had a decrease. Average research faculty decreased at both public and private institutions.

Again this year, all department types are forecasting an increase in the number of tenure-track faculty per department for each of the next two years. However, expected change in teaching faculty is not so uniform other than at U.S. CS departments.

Table F2a. Reasons Positions Left Unfilled

Reason	# Reported	% of Reasons
Didn't find a person who met our hiring goals	21	14%
Offers turned down	81	53%
Technically vacant, not filled for administrative reasons	6	4%
Hiring in progress	37	24%
Other	$7	5%
Total Reasons Provided	152	
Problems with persons not meeting hiring goals		**# Given**
Not found area (systems, graphics)		2
Not found senior level or level of research expertise		5
Not found teaching faculty candidates (PhD level, for online program)		2
Other reasons: several filled at lower level or with part time faculty		

Table F3. Gender of Newly Hired Faculty

	Tenure-Track		Teaching Professors		Other Instructors		Research		Postdoc		Total	
Male	327	74.1%	105	61.8%	77	72.6%	32	82.1%	117	72.7%	658	71.8%
Female	114	25.9%	65	38.2%	29	27.4%	7	17.9%	44	27.3%	259	28.2%
Nonbinary/Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unknown	7		6		2		0		3		18	
Total	448		176		108		39		164		935	

Table F4. Ethnicity of Newly Hired Faculty

	Tenure-Track		Teaching Professors		Other Instructors		Research		Postdoc		Total	
Nonresident Alien	49	12.3%	22	14.2%	11	11.5%	8	22.2%	27	19.0%	117	14.2%
American Indian / Alaska Native	3	0.8%	1	0.6%	0	0.0%	0	0.0%	3	2.1%	7	0.8%
Asian	197	49.6%	38	24.5%	28	29.2%	12	33.3%	54	38.0%	329	39.8%
Black or African-American	6	1.5%	6	3.9%	8	8.3%	0	0.0%	3	2.1%	23	2.8%
Native Hawaiian/ Pacific Islander	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
White	109	27.5%	74	47.7%	39	40.6%	10	27.8%	42	29.6%	274	33.2%
Multiracial, not Hispanic	7	1.8%	1	0.6%	0	0.0%	0	0.0%	2	1.4%	10	1.2%
Hispanic, any race	12	3.0%	3	1.9%	2	2.1%	0	0.0%	1	0.7%	18	2.2%
Resident, race/ethnic unknown	14	3.5%	10	6.5%	8	8.3%	6	16.7%	10	7.0%	48	5.8%
Total known residency	397		155		96		36		142		826	
Residency Unknown	51		21		12		3		22		109	
Total	448		176		108		39		164		935	

Table F5. Faculty Losses

Died	5
Retired	105
Took Academic Position Elsewhere	134
Took Nonacademic Position	39
Remained, but Changed to Part Time	19
Other	37
Unknown	10
Total	349

Figure F1 illustrates the comparative changes at U.S. CS departments in undergraduate enrollment, tenure-track faculty and teaching faculty since 2006, when the current enrollment surge began. This figure updates, with recent years' data, a figure from the Generation-CS report. The graph shows that teaching faculty increases during the past several years have approximately kept pace with enrollment growth. However, since the enrollment surge began, the cumulative growth in teaching faculty is just slightly more than half of the growth in majors. During the same period, tenure-track faculty size

Table F6. Gender of Current Faculty

	Full		Associate		Assistant		Teaching Professors		Other Instructors		Research		Postdoc		Total	
Male	2,049	81.5%	1,108	77.9%	1,257	71.4%	866	69.0%	600	72.4%	252	77.8%	489	73.0%	6,621	75.5%
Female	455	18.1%	315	22.1%	501	28.4%	386	30.8%	227	27.4%	72	22.2%	180	26.9%	2,136	24.3%
Nonbinary/Other	9	0.4%	0	0.0%	3	0.2%	3	0.2%	2	0.2%	0	0.0%	1	0.1%	18	0.2%
Unknown	215		84		119		57		25		60		43		603	
Total	2,728		1,507		1,880		1,312		854		384		713		9,378	

Table F7. Ethnicity of Current Faculty

	Full		Associate		Assistant		Teaching Professors		Other Instructors		Research		Postdoc		Total	
Nonresident Alien	56	2.4%	39	3.0%	269	16.6%	82	7.0%	37	4.9%	38	13.0%	133	24.1%	654	8.2%
American Indian / Alaska Native	34	1.5%	5	0.4%	31	1.9%	8	0.7%	1	0.1%	0	0.0%	3	0.5%	82	1.0%
Asian	735	31.8%	437	33.6%	616	38.0%	194	16.5%	117	15.5%	54	18.4%	200	36.2%	2,353	29.4%
Black or African-American	28	1.2%	29	2.2%	32	2.0%	31	2.6%	35	4.6%	4	1.4%	9	1.6%	168	2.1%
Native Hawaiian/ Pacific Islander	0	0.0%	1	0.1%	2	0.1%	2	0.2%	0	0.0%	0	0.0%	0	0.0%	5	0.1%
White	1,335	57.7%	689	53.0%	538	33.2%	744	63.4%	501	66.5%	170	58.0%	167	30.2%	4,144	51.8%
Multiracial, not Hispanic	15	0.6%	11	0.8%	18	1.1%	5	0.4%	4	0.5%	2	0.7%	1	0.2%	56	0.7%
Hispanic, any race	52	2.2%	37	2.8%	50	3.1%	48	4.1%	31	4.1%	6	2.0%	7	1.3%	231	2.9%
Resident, race/ ethnic unknown	57	2.5%	53	4.1%	64	4.0%	59	5.0%	27	3.6%	19	6.5%	33	6.0%	312	3.9%
Total known residency	2,312		1,301		1,620		1,173		753		293		553		8,005	
Residency Unknown	416		206		260		139		101		91		160		1,373	
Total	2,728		1,507		1,880		1,312		854		384		713		9,378	

Table F8. Current Tenured and Tenure-Track Faculty by Gender and Ethnicity, From 157 Departments

	Full Professor							Associate Professor							Assistant Professor							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N	Total	%
Nonresident Alien	49	7	0	0	2.7%	1.7%	0	33	6	0	0	3.4%	2.1%		206	62	0	1	18.5%	14.0%	0.0%	364	7.2%
Amer Indian or Alaska Native	30	4	0	0	1.6%	1.0%	0	3	2	0	0	0.3%	0.7%		22	9	0	0	2.0%	2.0%	0.0%	70	1.4%
Asian	608	125	2	0	33.0%	31.0%	0.25	337	100	0	0	34.9%	35.3%		464	152	0	0	41.8%	34.4%	0.0%	1,788	35.3%
Black or African-American	24	4	0	0	1.3%	1.0%	0	16	13	0	0	1.7%	4.6%		15	17	0	0	1.4%	3.8%	0.0%	89	1.8%
Native Hawaiian/ Pac Islander	0	0	0	0	0.0%	0.0%	0	1	0	0	0	0.1%	0.0%		1	1	0	0	0.1%	0.2%	0.0%	3	0.1%
White	1,083	246	6	0	58.7%	61.0%	0.75	539	150	0	0	55.9%	53.0%		353	183	1	1	31.8%	41.4%	100.0%	2,562	50.6%
Multiracial, not Hispanic	13	2	0	0	0.7%	0.5%	0	6	5	0	0	0.6%	1.8%		13	5	0	0	1.2%	1.1%	0.0%	44	0.9%
Hispanic, any race	37	15	0	0	2.0%	3.7%	0	30	7	0	0	3.1%	2.5%		37	13	0	0	3.3%	2.9%	0.0%	139	2.7%
Total Residency & Ethnicity Known	1,844	403	8	0				965	283	0	0				1,111	442	1	2				5,059	
Resident, ethnicity unknown	45	11	1	0				45	8	0	0				41	20	2	1				174	
Residency unknown	160	41	0	215				98	24	0	84				105	39	0	116				882	
Gender Totals	2,049	455	9	215				1,108	315	0	84				1,257	501	3	119				6,115	
%	81.5%	18.1%	0.4%					77.9%	22.1%	0.0%					71.4%	28.4%	0.2%						

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

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Table F9a. Current Non-Tenure-Track Faculty by Gender and Ethnicity, From 151 Departments

	Teaching Professors							Other Instructors							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Total	%
Nonresident Alien	56	26	0	0	7.3%	7.6%	0.0%	28	9	0	0	5.3%	4.5%	0.0%	119	6.5%
Amer Indian or Alaska Native	5	3	0	0	0.7%	0.9%	0.0%	1	0	0	0	0.2%	0.0%	0.0%	9	0.5%
Asian	119	75	0	0	15.5%	21.9%	0.0%	79	38	0	0	15.1%	19.0%	0.0%	311	16.9%
Black or African-American	18	13	0	0	2.3%	3.8%	0.0%	20	15	0	0	3.8%	7.5%	0.0%	66	3.6%
Native Hawaiian/ Pac Islander	2	0	0	0	0.3%	0.0%	0.0%	0	0	0	0	0.0%	0.0%	0.0%	2	0.1%
White	531	209	3	1	69.2%	60.9%	100.0%	364	135	1	1	69.5%	67.5%	100.0%	1,245	67.7%
Multiracial, not Hispanic	3	2	0	0	0.4%	0.6%	0.0%	3	1	0	0	0.6%	0.5%	0.0%	9	0.5%
Hispanic, any race	33	15	0	0	4.3%	4.4%	0.0%	29	2	0	0	5.5%	1.0%	0.0%	79	4.3%
Total Residency & Ethnicity Known	767	343	3	1				524	200	1	1				1,840	
Resident, ethnicity unknown	41	17	0	1				20	7	0	0				86	
Residency unknown	58	26	0	55				56	20	1	24				240	
Gender Totals	866	386	3	57				600	227	2	25				2,166	
%	69.0%	30.8%	0.2%					72.4%	27.4%	0.2%						

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

Table F9b. Current Non-Tenure-Track Research Faculty and Postdoctorates by Gender and Ethnicity, From 120 Departments

	Non-Tenure-Track Research							Postdoctorates							Ethnicity Totals	
	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Male	Fem	Nonb	N/R	% of M*	% of F*	% of N*	Total	%
Nonresident Alien	30	8	0	0	14.3%	12.5%		103	29	0	1	26.5%	22.1%		171	21.5%
Amer Indian or Alaska Native	0	0	0	0	0.0%	0.0%		1	2	0	0	0.3%	1.5%		3	0.4%
Asian	38	16	0	0	18.1%	25.0%		147	53	0	0	37.9%	40.5%		254	32.0%
Black or African-American	3	1	0	0	1.4%	1.6%		8	1	0	0	2.1%	0.8%		13	1.6%
Native Hawaiian/Pac Islander	0	0	0	0	0.0%	0.0%		0	0	0	0	0.0%	0.0%		0	0.0%
White	132	38	0	0	62.9%	59.4%		125	42	0	0	32.2%	32.1%		337	42.4%
Multiracial, not Hispanic	2	0	0	0	1.0%	0.0%		0	1	0	0	0.0%	0.8%		3	0.4%
Hispanic, any race	5	1	0	0	2.4%	1.6%		4	3	0	0	1.0%	2.3%		13	1.6%
Total Residency & Ethnicity Known	210	64	0	0				388	131	0	1				794	
Resident, ethnicity unknown	16	3	0	0				17	11	0	5				52	
Residency unknown	26	5	0	60				84	38	1	37				251	
Gender Totals	252	72	0	60				489	180	1	43				1,097	
%	77.8%	22.2%	0.0%					73.0%	26.9%	0.1%						

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

has increased by about 1/10 the rate of enrollment growth. For well over a decade, the gap between growth in tenure-track faculty and growth in undergraduate enrollment has been getting wider.

Among U.S. CS departments, those in private institutions are on average larger than those in public institutions in both tenure-track and total faculty size, as has been observed consistently for many years. Canadian departments, on average, are larger than U.S. CS departments, in terms of both tenure-track and total faculty. Their average tenure-track faculty size exceeds that of U.S. CS departments in public institutions and is nearly the same as that of U.S. CS departments in private institutions. U.S. I departments are similar in total faculty size to U.S. CS departments but have fewer tenure-track faculty and more teaching faculty. Those U.S. CE departments that report to the survey are on average closer in total faculty size to U.S. CS departments in private institutions than to those in public institutions, but they have a larger number of tenure-track faculty than do U.S. CS departments at either public or private institutions. When examining the size of U.S. CE and I departments, it is important to note 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.

Table F2 summarizes faculty hiring this past year. Departments in the U.S. overall were less successful in hiring tenure-track faculty than they were last year. The success rate at this year's reporting U.S. CS departments was 76.6 percent compared with last year's reported 86.9 percent. The difference was at public universities, where it was 72.0 percent vs 85.5 percent last year; at private universities it was 90.0 percent, similar to last year's 90.8 percent. U.S. CE departments had a success rate of 100 percent, but only had 13 vacancies among those CE departments reporting. U.S. I departments had a success rate of 81.5 percent versus 80.0 percent last year. Canadian departments again had a lower success rate than U.S. departments, at 55.9 percent, which was lower than the 68.8 percent reported last year. In aggregate across all types of departments, the tenure-track hiring success rate was 75.3 percent, compared to 85.2 percent in last year's report.

A total of 452 new tenure-track hires were reported in aggregate across all department types. This year's total is slightly below the 468 new tenure-track hires reported last year.

The hiring of teaching faculty was very successful, with an aggregate success rate across all department types of 86.1 percent for Teaching Professors versus 80.5 percent last year. In the category of Other Instructors, departments collectively reported hiring more faculty than they "tried to fill". This phenomenon can occur when tenure-track or Teaching Professor openings were not filled; in such a case, hiring someone in the Other Instructor category may have been the best option to help fill the need for teaching faculty. It also can occur as a byproduct of another hire. The total number of reported hires increased in the Teaching Professor category from 140 last year to 198 this year despite not filling 32 positions with someone in this category; last year there were 34 Teaching Professor vacancies that weren't filled by someone in that category. The total of 90 hires in the category of Other Instructor is similar to the 93 reported last year.

When all categories of academic positions (tenure-track, teaching faculty, research faculty, and postdoc) are considered collectively, the fraction of female hires was 28.2 percent, little change from the 28.0 percent reported last year. For tenure-track positions, however, there was a decline from 28.0 percent to 25.9 percent (Table F3). Even with this decline, the tenure-track percentage is higher than the percentage of females among new Ph.D.s produced during the past year (24.1 percent.

Racial/ethnic diversity among new tenure-track faculty declined this year. White, Non-resident Alien and Asian hires collectively comprise 89.4 percent of those new tenure-track faculty whose residency is known. Last year this was 85.6 percent. Another 3.5 percent of those with known residency are of unknown race/ethnicity, leaving only 7.1 percent across the five collective categories of American Indian, Black, Hispanic, Native Hawaiian, and Multiracial. The teaching faculty category of Other Instructors had the highest percentage of hires across these five categories at 10.4 percent (Table F4).

Table F10 shows the sources of new faculty of each type. The fraction of newly hired Assistant Professors who had been postdocs in the previous year was 31 percent. Since we began collecting such information in 2015, this percentage has ranged from 21 to 31 percent so this year's data is at the high end of the historical range. About 30 percent of new Assistant Professors were new Ph.Ds (versus 33 percent last year), while only 28 percent of new Assistant Professors were in other academic positions the previous year (last year it was 35 percent). We don't know the previous academic rank of the new Assistant Professors who came from other academic positions; they might have been teaching faculty or research faculty as a transitional position, or they might have come from other tenure-track positions. A greater percentage of new Assistant Professor hires came from industry this year (11 percent), which is higher than last year, but similar to the level from two years ago.

This year, we have data about the previous position of 61 newly hired senior faculty, compared to 83 for whom we had such data last year. The difference is almost exclusively at the associate professor level. Of this year's new senior hires, 53 of the 61, including all of the associate professors, came from other academic institutions. Among newly hired Teaching Professors, 18 percent were hired without a Ph.D, versus 14 percent last year, and 56 percent of new Other Instructors were hired without a Ph.D. Last year, all reported Other Instructors were hired without a Ph.D. The fraction of new research faculty who did not have a Ph.D. rose from 29 to 36 percent.

After a large increase in faculty losses reported last year, this year the reported losses declined by nearly 14 percent (Table F5). The three most prevalent reasons for a loss (departing for another academic position, retiring, and departing for a non-academic position, in that order) each showed declines from last year's numbers. Again this year, more losses were reported in the "other" category than were reported last year.

Table F6 disaggregates current faculty by gender for the various faculty types. Table F7 does likewise with respect to race/ethnicity. In aggregate across all faculty types, the proportion of current faculty who are female remained at 24.3 percent. Within the tenure-track ranks, there was a slight increase in the proportion of faculty who are female among full professors and assistant professors, and a slight decline among associate professors. The two categories of teaching faculty also showed slight increases, while there were declines among research faculty and postdocs. The proportion of current faculty who are American Indian, Black, Native Hawaiian, Multiracial or Hispanic is 6.8 percent this year versus 6.4 percent last year. The category of Other Instructors had the highest percentage at 9.3, while postdocs had the lowest at 3.6.

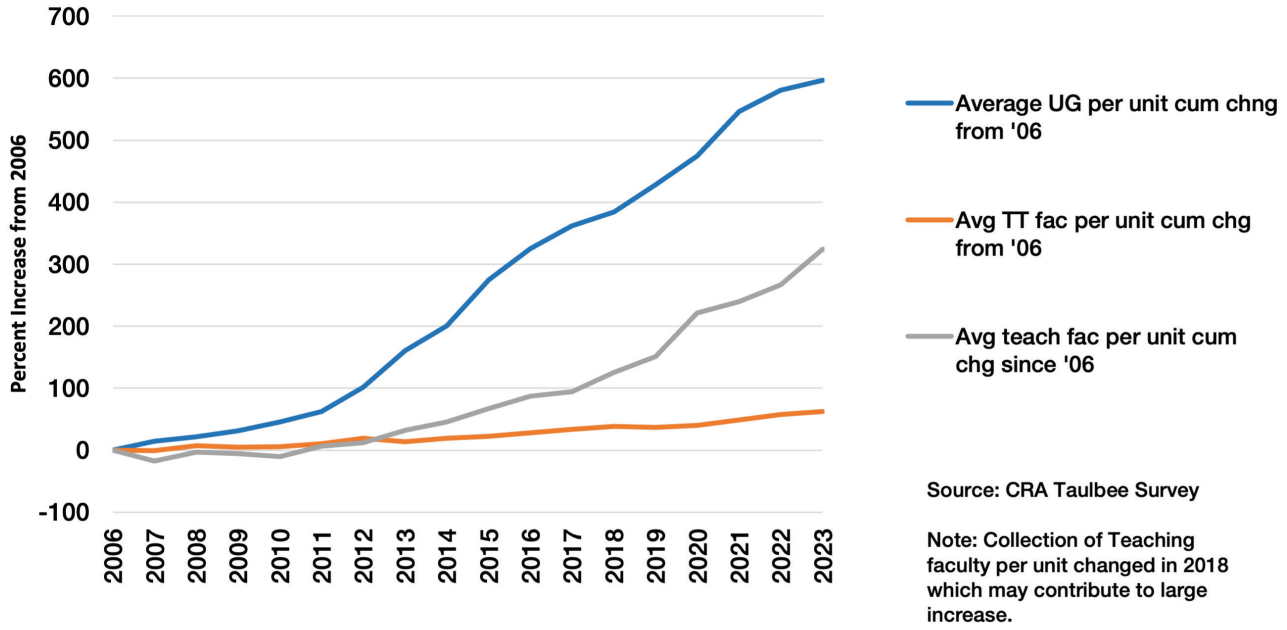
Tables F8, F9a and F9b provide gender x race/ethnicity crosstab data for current faculty. Table F8 shows, for each race/ethnicity category at each tenure-track faculty rank, the percentage of total male faculty at that rank represented by that race/ethnicity

Table F10. Source of New Faculty

Source	Full	Associate	Assistant	Teaching Prof	Other Instruc	Research	Postdoc	Total	% Total from Source	% Assistant from Source
New PhD	2	0	97	40	20	16	51	226	34%	30%
From Postdoc	2	0	103	10	1	3	10	129	19%	31%
From Other Academic	19	34	92	46	20	4	25	240	36%	28%
From Industry	4	0	36	18	13	5	2	78	12%	11%
Total With Hire Source	27	34	328	114	54	28	88	673		
Hired Without PhD	1	0	6	21	30	10	7	75		
% Hired Without PhD			2%	18%	56%	36%				

Figure FI. Comparative Change in Majors and instructional Resources per U.S. CS Unit

CRA Taulbee Survey 2023



category, and the percentage of total female faculty at that rank represented by that category. Tables F9a and F9b respectively do likewise for teaching faculty and for research faculty and postdocs. Most notable among tenure-track faculty is that Asian faculty comprise a greater fraction of male assistant professors than female assistant professors, while White faculty comprise a greater percentage of female assistant professors than male assistant professors. The reverse situation holds among Teaching Professors and Research Faculty with respect to both Asian and White faculty.

Research Expenditures (Table R1; Figures R1-R2)

Table R1 shows the distribution of departments' total research 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 only to the number of tenure-track faculty members. The second (Figure R2) is relative to research faculty and postdocs as well as tenure-track faculty. Canadian levels are shown in Canadian dollars.

Median research expenditures for 2022-23 increased over reported 2021-22 levels at U.S. CS departments in both public and private institutions, as well as at U.S. I departments. The respective percentage increases were 13.2, 9.3 and 15.2. At Canadian departments, reported expenditures decreased by 11.4 percent. An insufficient number of CE departments reported expenditure information to allow for comparisons.

The U.S. CS data show that larger departments in private institutions have more external funding per capita than smaller departments. In public institutions, there is a less clear relationship between per capita expenditures and faculty size although the largest departments at public institutions have more funding per capita than smaller departments. These statements hold for each capitation method.

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	74	$ 1,731,638	$ 3,036,891	$ 7,045,607	$ 15,041,468	$ 21,257,853
US CS Private	23	$ 2,195,923	$ 4,057,771	$ 10,054,780	$ 19,183,796	$ 68,523,361
US CE	2					
US Info	12	$ 1,795,937	$ 5,211,573	$ 7,180,055	$ 8,417,238	$ 12,700,089
Canadian	6			$ 5,712,091		

Figure R1. Research Expenditures Normalized by Tenure-Track Size

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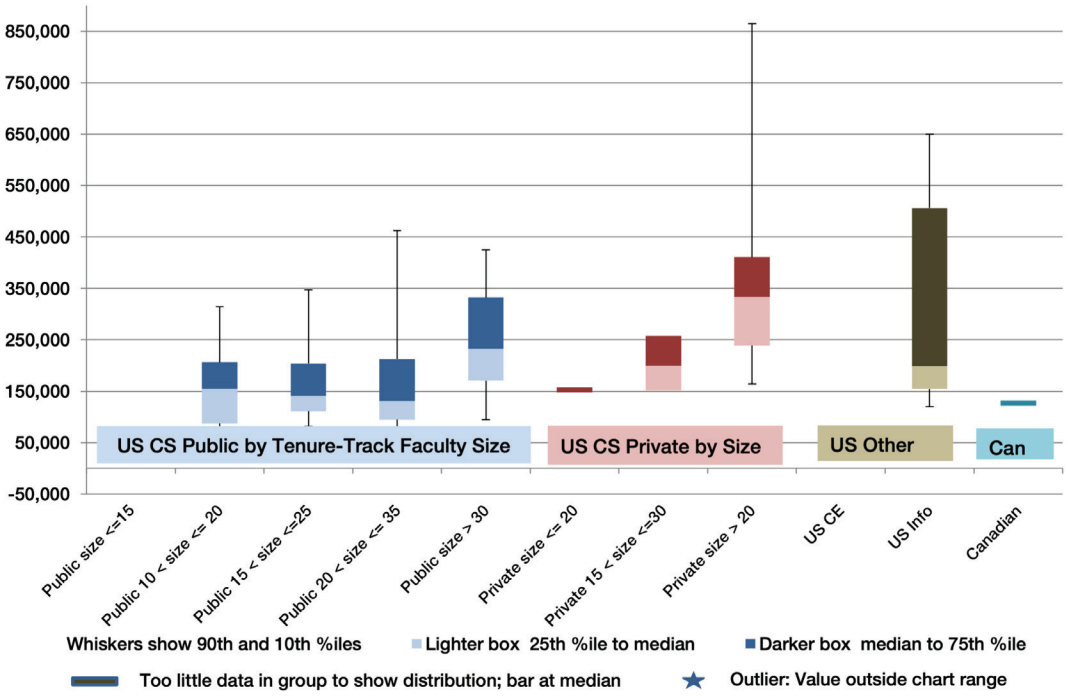
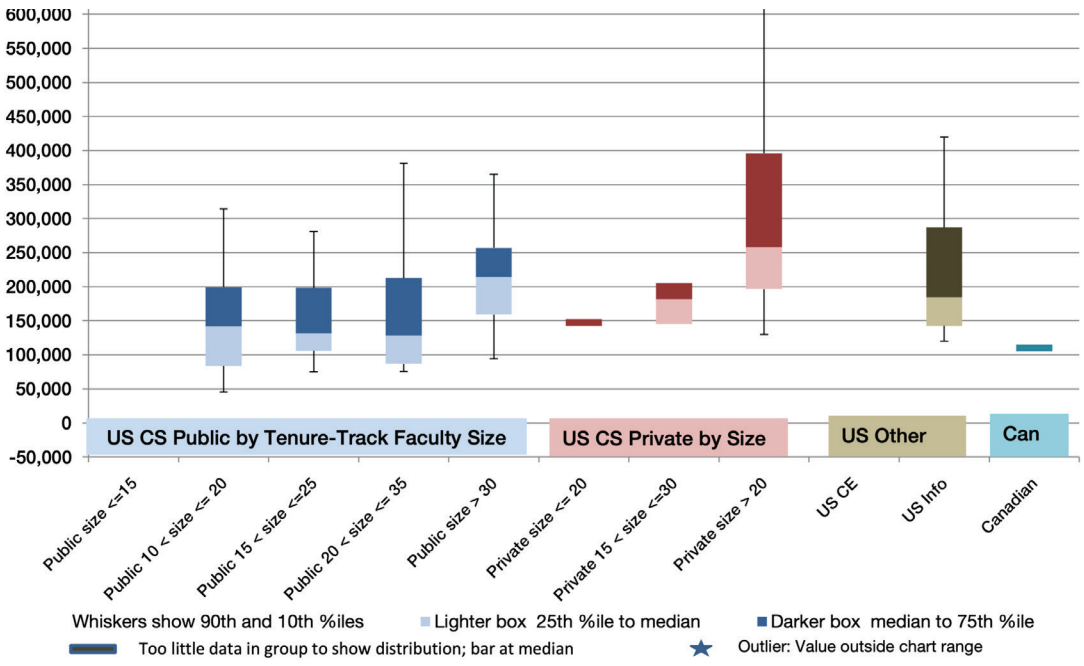


Figure R2. Research Expenditures Normalized by Tenure-Track + Research Faculty + Postdoctorates

CRA Taulbee Survey 2023



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

Table G1 shows the number of doctoral students supported as full-time students as of fall 2023, 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. Table G1a shows similar data for supported master's students.

The average number of TAs on institutional funds among doctoral students in U.S. CS departments increased 21.4 percent, from 36.6 to 44.4. The increase was entirely due to departments in public institutions; the average in private institutions was almost the same as it was last year. U.S. I departments reported a 27.7 percent increase from last year. No comparisons are made for CE and Canadian departments due to the small number reporting.

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

		On Institutional Funds						On External Funds						Total
Department Type	# Dept	Teaching Assistants		Research Assistants		Full-Support Fellows		Teaching Assistants		Research Assistants		Full-Support Fellows		
US CS Public	85	4,265.5	0.40	1,604.3	0.10	431	0	1.8	0	4,413.9	0.40	278	0	10,994.4
US CS Private	25	619.6	0.20	1,051.6	0.30	299	0.1	45	0	1,491.2	0.40	216	0.1	3,722.5
US CS Total	110	4,885.1	0.30	2,655.9	0.20	730	0.1	46.8	0	5,905.1	0.40	494	0	14,716.9
US CE	4	142.9	0.20	52	0.10	120	0.1	0	0	494.8	0.60	18	0	827.7
US Info	13	368.7	0.40	180.8	0.20	56.8	0.1	0	0	327	0.30	40	0	973.3
Canadian	7	252	0.30	246.3	0.30	3	0	0	0	230.7	0.30	8	0	740
Grand Total	134	5,648.7	0.30	3135	0.20	909.8	0.1	46.8	0	6,957.6	0.40	560	0	17,257.76

Table G1a. Master's Students Supported as Full-Time Students by Department Type

		On Institutional Funds						On External Funds						Total
Department Type	# Dept	Teaching Assistants		Research Assistants		Full-Support Fellows		Teaching Assistants		Research Assistants		Full-Support Fellows		
US CS Public	62	1,844.45	0.7	199.3	0.1	20.0	0.3%	5.0	0.0	499.5	0.2	8.0	0.0	2,576.20
US CS Private	15	671.00	0.9	33.0	0.0	15.0	1.0%	1.0	0.0	49.3	0.1	8.0	0.0	777.33
US CS Total	77	2,515.45	0.8	232.3	0.1	35.0	0.5%	6.0	0.0	548.8	0.2	16.0	0.0	3,353.53
US CE	2	21.50	0.5	1.0	0.0	12.0	0.0%	0.0	0.0	9.0	0.2	0.0	0.0	43.50
US Info	12	204.15	0.8	22.8	0.1	2.0	0.0%	0.0	0.0	22.3	0.1	0.0	0.0	251.15
Canadian	6	278.50	0.5	114.0	0.2	0.0	0.0%	0.0	0.0	217.0	0.4	0.0	0.0	609.50
Grand Total	97	3,019.60	0.7	370.0	0.1	49.0	0.4%	6.0	0.0	797.1	0.2	16.0	0.0	4,257.68

Table G2. Fall 2023 Academic-Year Graduate Stipends by Department Type and Support Type

Teaching Assistantships						
Percentiles of Department Averages						
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	92	$ 16,160	$ 19,532	$ 23,000	$ 27,107	$ 29,463
US CS Private	28	$ 23,121	$ 27,529	$ 33,318	$ 39,654	$ 44,157
US CE	5			$ 26,520		
US Info	13	$ 18,400	$ 21,750	$ 25,980	$ 28,558	$ 31,329
Canadian	7		$ 7,026	$ 8,010	$ 11,200	
Research Assistantships						
Percentiles of Department Averages						
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	92	$ 18,000	$ 20,222	$ 23,741	$ 26,760	$ 31,512
US CS Private	34	$ 22,609	$ 28,041	$ 36,143	$ 39,885	$ 43,120
US CE	5			$ 26,520		
US Info	13	$ 18,400	$ 21,750	$ 25,980	$ 28,558	$ 31,329
Canadian	7		$ 11,454	$ 16,226	$ 20,750	
Full-Support Fellows						
Percentiles of Department Averages						
Department Type	# Depts	10th	25th	50th	75th	90th
US CS Public	49	$ 20,600	$ 25,500	$ 30,000	$ 34,000	$ 35,067
US CS Private	30	$ 27,706	$ 31,134	$ 36,968	$ 39,885	$ 43,669
US CE	3					
US Info	9		$ 25,980	$ 28,647	$ 31,500	
Canadian	5			$ 15,116		

Among research associates, the average number of doctoral students per U.S. CS department who were supported on external funding decreased compared to last year by 3.1 percent overall and in public institutions, and 1.0 percent in private institutions. At U.S. I departments, there was an increase of 10.0 percent in the average per department. The average per department for research associates supported on institutional funds, both at US. CS and at U.S. I departments, increased compared with last year. U.S. CS

departments increased by over 20 percent, while I departments increased by over 40 percent. Within U.S. CS departments, those at private institutions reported a 32.7 percent increase and those at public institutions reported a 22.1 percent increase.

In U.S. CS departments, the average number of full-support fellows on both institutional and external funds increased compared with last year. In U.S. I departments, there was an increase in the average number of full-support fellows on external funds, but not on institutional funds; this is the opposite of what occurred last year.

Aggregated across all department types, a greater percentage of total support was for TAs than it was last year (from 30 percent to 33 percent), with about 1.5 percentage point drops in each of the RA and full-support fellow categories. Among U.S. CS departments, those at private institutions have a greater fraction of their supported students (over 80 percent) than do public institutions (slightly over 60 percent) as RAs and full-support fellows, and a smaller fraction supported as TAs.

Among supported master's students aggregated across all department types, 71 percent are TAs, the same percentage as two years ago; last year's percentage was 68,6. The percentage who were RAs was 27.4 percent, about one-half of a percentage point higher than last year, while that for full-support fellows fell from 4.5 to 1.6 percent. At U.S. CS departments, TA support comprises a higher percentage than the aggregate, while RA support comprises a lower percentage than the aggregate. Private institutions have a higher percentage of their supported master's students employed as TAs than do public institutions, while the reverse is true for RA support.

Table G2 shows the distribution of stipends for TAs, RAs, and full-support fellows. U.S. CS data is 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.

Compared with last year's report, the median TA salaries in U.S. CS departments at public institutions increased 3.1 percent, and those at private institutions increased 5.3 percent. Median TA salaries at private institutions are over 40 percent higher than at public

Figure G1. Teaching Assistantship Stipends

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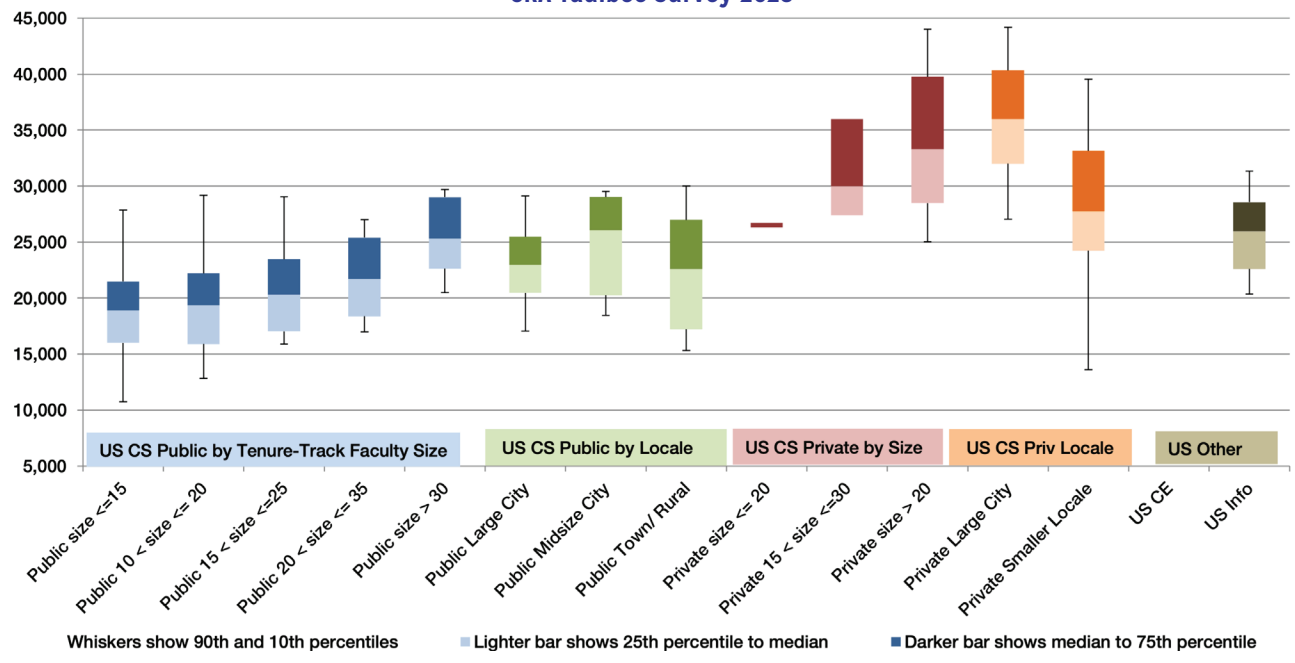


Figure G2. Research Assistantship Stipends

CRA Taulbee Survey 2023

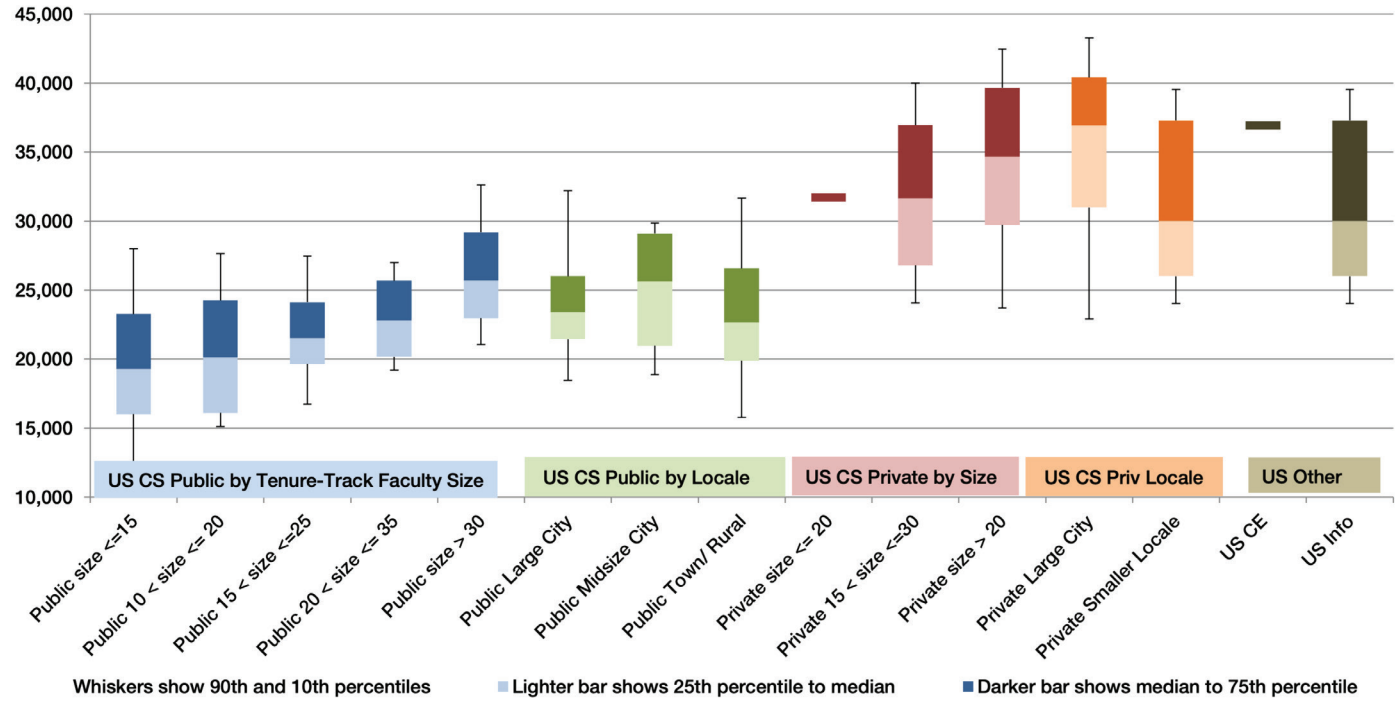
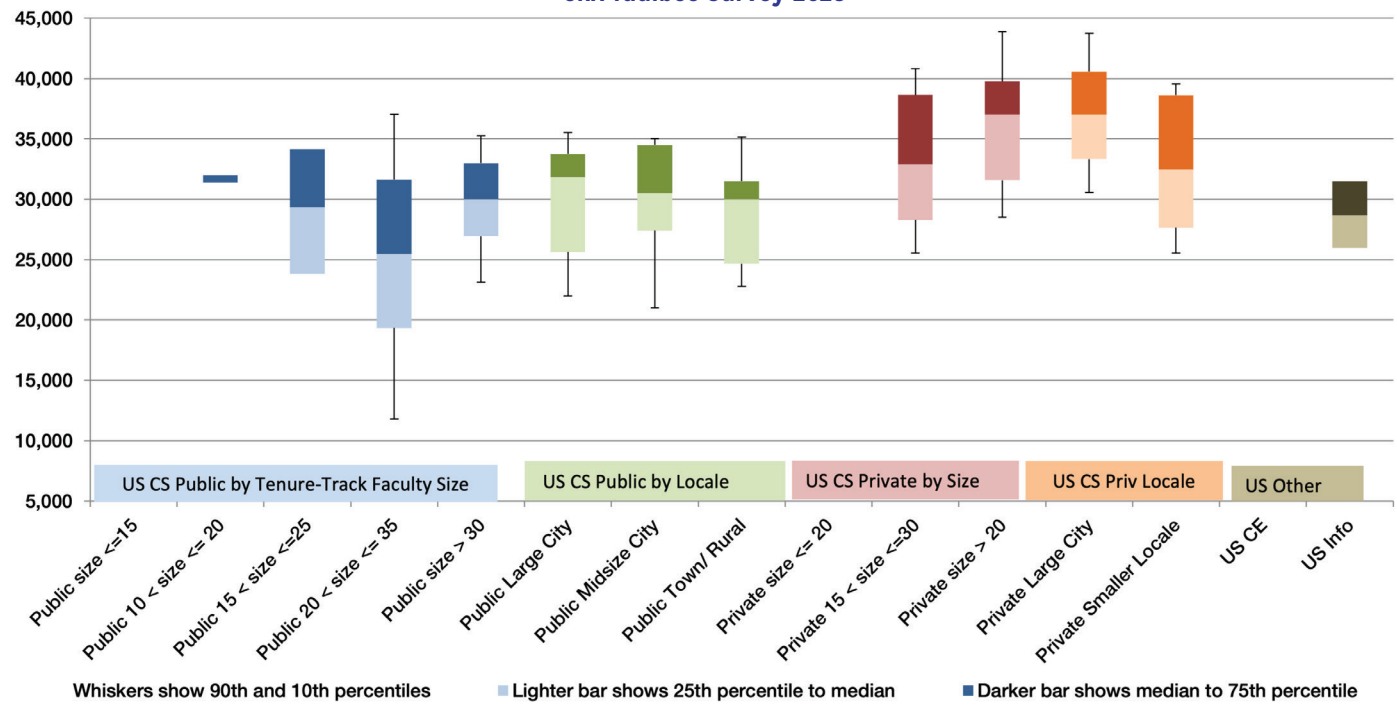


Figure G3. Full Support Fellows Stipends

CRA Taulbee Survey 2023



institutions. For RAs, median salaries at U.S. CS institutions rose 5.1 percent at public institutions but only 0.2 percent at private institutions. Median RA salaries at private institutions also are over 40 percent higher than at public institutions. For full-support fellows, median salaries rose 7.1 percent in U.S. CS departments at public institutions and 0.9 percent at private institutions. Median full-support fellow salaries are approximately 15 percent higher at private institutions than at public institutions. Median stipends at U.S. I schools again fall in between those at public and private U.S. CS departments for TAs and RAs, but they were slightly lower than U.S. CS public institutions this year for full-support fellows.

In U.S. CS departments at private institutions, larger departments have higher median stipends than smaller departments for TAs and RAs, and departments in large cities have higher median stipends than those in smaller locales for all three support types. At public institutions, TA and RA stipends also typically are higher in larger departments, and full-support fellow stipends tend to be slightly higher in larger locales.

Faculty Salaries (Tables S1-S22; Figures S1-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, 2024 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. No attempt is made to adjust any salaries in our report for the location of the responding unit.

Table S1. Nine-month Salaries, 135 Responses of 205 US CS Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	111	111	111	133	96	119	130	131	128	43	46
Indiv	772	632	647	2,145	361	778	1,190	1,490	1,614	233	396
10	$152,425	$148,896	$143,348	$150,803	$114,949	$114,879	$117,588	$102,411	$73,470	$46,082	$49,042
25	$176,745	$163,080	$159,347	$164,873	$120,757	$126,034	$127,896	$111,196	$85,797	$74,125	$52,351
50	$204,477	$194,009	$185,622	$189,012	$137,292	$143,654	$141,723	$125,692	$97,690	$91,436	$67,194
75	$240,196	$217,365	$205,353	$217,744	$151,425	$160,665	$160,102	$137,076	$115,041	$146,381	$72,623
90	$274,886	$236,114	$237,745	$240,180	$161,919	$171,554	$170,577	$145,567	$133,432	$174,082	$77,452

Table S1a. Nine-month Salaries, 135 Responses of 205 US CS Departments, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	53	54	62	72	109	33	31	34	50	75
Indiv	203	122	190	261	1,055	75	60	106	152	559
10	$78,109	$81,226	$78,007	$77,353	$80,270	$60,046	$61,800	$59,590	$64,350	$65,377
25	$96,708	$93,019	$91,369	$84,750	$92,992	$70,202	$76,214	$71,017	$73,734	$75,181
50	$115,317	$109,608	$101,637	$95,758	$103,062	$87,586	$94,232	$90,768	$83,298	$88,195
75	$143,609	$127,040	$122,506	$112,127	$131,430	$107,689	$103,586	$107,241	$94,867	$99,662
90	$156,999	$149,523	$140,325	$129,912	$144,737	$125,325	$125,250	$120,432	$105,286	$120,739

U.S. CS data is reported in Tables S1-S16 and in the box and whiskers diagrams comprising Figures S1-S9. Data for CE, I, Canadian, and new Ph.D.s are reported in Tables S17-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 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). Therefore, it is not a true median of all the salaries. Salaries are not reported if there are too few data points in the response set.

In these tables, we 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. We also disaggregate teaching faculty salaries into the two subclasses, Teaching Professors and Other Instructors. Within each subclass, there is further breakdown into persons with time in rank of less than 3 years, 3-5 years, 6-8 years, and 9 or more years. The teaching faculty salary disaggregations are in Tables S1a to S19a.

The U.S. CS data is stratified in three stratification dimensions: (1) public vs. private educational institution; (2) tenure-track faculty size of the unit offering the computing program; and (3) type of locale of the institution. These have been the dimensions in use since 2011. Box and whisker diagrams for each faculty type and rank, including time in rank for associate and full professors, compare salaries along each of the three dimensions (Figures S1-S9). The strata for tenure-track faculty size were chosen so that each is highly likely to have enough programs reporting; we have been using these strata for several years. Note that the strata overlap, so

Table S2. Nine-month Salaries, 96 Responses of 144 US CS Public (All Public), Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	76	81	78	93	69	85	92	92	90	31	29
Indiv	518	431	437	1,455	256	519	822	1,024	1,061	150	185
10	$150,302	$143,755	$143,175	$144,081	$110,960	$112,325	$116,492	$100,816	$72,109	$44,648	$47,215
25	$170,542	$154,891	$157,165	$161,032	$119,405	$121,172	$122,898	$108,325	$83,827	$70,505	$49,821
50	$195,840	$186,589	$180,046	$183,419	$132,401	$135,206	$134,364	$117,810	$93,176	$90,000	$58,295
75	$228,058	$207,957	$196,224	$208,042	$148,210	$153,446	$149,564	$131,103	$104,982	$125,934	$70,000
90	$255,744	$230,491	$220,526	$227,276	$158,667	$164,413	$165,037	$138,126	$119,878	$171,888	$73,024

Table S2a. Nine-month Salaries, 96 Responses of 144 US CS Public (All Public), Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	37	37	40	52	76	29	22	25	40	55
Indiv	126	91	113	140	679	66	48	79	116	382
10	$74,737	$79,651	$74,936	$75,492	$78,404	$59,627	$66,955	$59,636	$64,350	$65,377
25	$93,982	$90,974	$87,409	$81,865	$85,433	$68,673	$75,510	$69,500	$69,272	$73,318
50	$111,489	$106,750	$98,976	$90,314	$98,378	$86,570	$89,236	$82,533	$82,100	$86,000
75	$127,948	$118,482	$117,285	$105,000	$113,544	$100,488	$99,773	$96,737	$92,617	$94,971
90	$161,101	$138,229	$131,437	$124,840	$134,440	$117,594	$110,776	$118,397	$98,713	$107,879

that most departmental data affect multiple strata. This may be especially useful to a department near the boundary of one stratum. For type of locale, we have three strata for public institutions (large city and associated suburbs [population >= 250,000], mid-size city and associated suburbs [population between 100,000 and 250,000], or small city/rural locale [population less than 100,000]) and two strata for private institutions (large city and suburbs, or not). The classification of an educational institution into a locale stratum was performed using the Carnegie Classification database.

Those departments reporting salary data were provided a summary report earlier this year. In that report, those departments that provided individual salaries were additionally provided more comprehensive distributional information based on these individual salaries.

Overall, we had a response rate of 54 percent, while last year's overall response rate was 61 percent. All department types showed percentage decreases. Among U.S. CS departments, the response rate decreased to 65 percent from 71 percent last year. The CE response rate was 11 percent versus 20 percent last year. The Canadian response rate decreased to 20 percent from 45 percent. The response rate from the U.S. Information departments was 61 percent compared with 74 percent last year, but more I departments received this year's survey. Of those departments reporting this year, 60 percent provided individual salary data, compared with 57 percent last year. In general, this year's response rates were more like those of two years ago than to last year's rates.

The median of the average salaries in U.S. CS departments at private institutions is higher than that at public institutions for all faculty types (Tables S2 and S3). This pattern is consistent with observations in previous years.

Table S3. Nine-month Salaries, 39 Responses of 61 US CS Private (All Private), Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	35	30	33	39	27	34	37	38	37	11	17
Indiv	254	201	210	680	105	259	365	461	538	69	211
10	$171,605	$163,648	$144,940	$161,577	$119,621	$130,238	$131,285	$116,283	$92,608	$75,000	$51,653
25	$188,127	$188,614	$178,165	$180,440	$130,438	$141,047	$137,862	$124,046	$96,388	$87,917	$56,591
50	$220,005	$212,918	$195,002	$217,744	$144,072	$160,140	$158,708	$137,942	$111,722	$111,201	$72,635
75	$260,855	$235,635	$229,617	$238,906	$156,268	$170,987	$167,749	$145,303	$131,430	$154,015	$75,904
90	$285,806	$261,584	$262,116	$255,267	$164,969	$175,778	$176,452	$154,414	$144,443	$174,631	$79,691

Table S3a. Nine-month Salaries, 39 Responses of 61 US CS Private (All Private), Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	16	17	22	20	32	4	9	9	10	19
Indiv	77	31	77	121	372	9	12	27	36	166
10	$99,354	$93,798	$91,281	$89,239	$94,355				$73,287	$69,267
25	$124,621	$101,765	$96,835	$98,178	$101,418		$83,200	$92,508	$88,350	$88,645
50	$137,341	$119,900	$118,601	$110,800	$130,274	$115,550	$95,101	$94,292	$92,351	$98,516
75	$149,699	$139,572	$131,203	$125,948	$137,285		$125,250	$117,047	$106,625	$119,303
90	$156,846	$156,564	$147,988	$130,370	$147,158				$131,029	$132,350

Table S4. Nine-month Salaries, 14 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	7	9	8	13	9	12	13	12	13	4	2
Indiv	14	20	18	59	19	32	52	48	63	6	
10				$130,790		$101,576	$109,191	$97,584	$62,509		
25	$147,460	$141,274	$145,473	$137,943	$116,201	$109,321	$112,258	$99,405	$70,542		
50	$165,295	$144,613	$156,467	$151,813	$127,967	$112,342	$117,000	$100,529	$81,625	$102,525	
75	$175,989	$158,220	$165,543	$164,620	$141,709	$117,602	$122,244	$104,025	$89,114		
90				$185,386		$132,092	$136,400	$104,755	$94,740		

Table S4a. Nine-month Salaries, 14 Responses of US CS Public With <=15 Tenure-Track Faculty, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	4	5	4	8	10	3	3	3	6	7
Indiv	6	10	7	17	42				7	21
10					$71,128					
25				$69,963	$74,906					$61,579
50	$73,318	$92,573	$73,810	$75,313	$83,313				$62,430	$67,000
75				$84,049	$92,044					$78,112
90					$95,934					

Table S5. Nine-month Salaries, 31 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	20	22	18	28	20	24	27	28	28	8	6
Indiv	58	60	44	179	57	80	141	142	178	60	12
10	$143,962	$139,076	$137,498	$139,227	$110,960	$109,382	$113,682	$99,274	$68,500		
25	$151,900	$145,016	$144,220	$149,861	$117,379	$112,374	$117,213	$102,010	$72,169	$51,106	
50	$170,812	$155,861	$156,467	$163,289	$122,668	$120,634	$122,244	$107,336	$82,840	$92,807	$49,417
75	$182,325	$173,926	$165,724	$178,924	$128,195	$129,917	$132,582	$119,322	$91,368	$123,361	
90	$192,178	$201,763	$184,699	$187,785	$142,417	$136,898	$145,799	$127,875	$99,168		

Table S5a. Nine-month Salaries, 31 Responses of US CS Public With 10 < Tenure-Track Faculty <=20, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	10	9	11	18	24	11	5	9	11	18
Indiv	24	13	19	34	104	23	5	16	18	74
10	$69,733		$69,150	$69,806	$72,732	$60,230			$50,000	$56,429
25	$72,130	$80,594	$73,810	$75,560	$79,796	$68,184		$59,915	$65,319	$69,931
50	$82,567	$90,974	$94,054	$81,200	$84,500	$73,818	$74,003	$69,500	$72,940	$73,262
75	$96,275	$94,546	$101,958	$85,000	$94,911	$86,466		$82,533	$91,453	$86,313
90	$99,195		$110,652	$89,017	$101,327	$101,078			$95,000	$97,279

Table S6. Nine-month Salaries, 30 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	23	24	22	29	21	25	28	29	29	8	7
Indiv	79	77	61	233	61	84	152	182	191	61	16
10	$142,865	$144,577	$139,958	$142,295	$110,114	$112,925	$115,813	$101,690	$71,937		
25	$159,055	$152,016	$146,632	$158,760	$118,275	$119,602	$119,576	$106,826	$80,111	$53,068	$48,553
50	$179,920	$167,960	$160,104	$172,395	$124,908	$124,459	$129,604	$114,313	$87,074	$86,688	$49,500
75	$191,510	$199,622	$171,089	$188,804	$132,455	$134,865	$136,938	$120,894	$93,479	$111,839	$67,194
90	$206,265	$209,859	$192,967	$195,771	$147,164	$146,565	$148,139	$130,254	$102,318		

Table S6a. Nine-month Salaries, 30 Responses of US CS Public With 15 < Tenure-Track Faculty <=25, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	10	7	10	16	23	12	7	7	13	19
Indiv	25	9	19	30	100	24	12	14	29	91
10	$74,882		$74,689	$77,754	$79,347	$60,803			$73,962	$70,263
25	$90,867	$85,392	$87,522	$81,800	$81,489	$67,260	$70,259	$69,286	$78,272	$73,065
50	$97,269	$94,546	$94,311	$85,941	$92,500	$72,010	$77,621	$82,533	$82,870	$83,762
75	$112,740	$102,191	$103,713	$93,173	$96,910	$90,040	$92,887	$89,719	$95,000	$90,098
90	$115,993		$111,877	$94,358	$104,485	$101,015			$96,503	$96,519

Table S7. Nine-month Salaries, 21 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	17	18	17	20	15	18	20	20	20	6	2
Indiv	81	67	51	216	55	70	137	187	180	15	
10	$162,484	$149,742	$143,794	$157,426	$106,885	$117,943	$117,410	$101,810	$74,370		
25	$169,208	$154,592	$149,049	$162,861	$114,528	$121,903	$126,683	$107,806	$82,738		
50	$191,533	$169,583	$171,118	$181,036	$132,166	$134,208	$130,510	$113,955	$90,348	$89,443	
75	$204,546	$204,651	$195,823	$195,918	$135,630	$145,955	$141,400	$125,283	$98,825		
90	$216,162	$229,210	$220,305	$207,839	$146,803	$151,547	$146,234	$130,734	$106,388		

Table S7a. Nine-month Salaries, 21 Responses of US CS Public With 20 < Tenure-Track Faculty <=35, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	8	8	9	11	17	5	4	2	10	12
Indiv	21	20	27	40	137	7	9		22	43
10				77,323	74,409				67,050	62,272
25	$93,821	$78,821	$78,000	$78,985	$85,828				$76,773	$75,912
50	$108,120	$90,634	$87,956	$88,601	$94,713	$60,000	$92,887		$80,229	$84,804
75	$117,008	$111,596	$92,779	$93,232	$99,463				$89,718	$92,903
90				$94,716	$105,049				$98,713	$109,822

Table S8. Nine-month Salaries, 48 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	42	44	45	48	36	44	48	48	45	19	20
Indiv	407	311	348	1,122	166	387	595	768	775	96	164
10	$171,312	$155,406	$161,410	$166,193	$117,961	$128,156	$124,278	$111,558	$84,884	$58,244	$49,337
25	$194,896	$182,083	$179,817	$182,161	$128,772	$135,895	$134,952	$117,355	$92,635	$72,237	$54,299
50	$219,929	$201,828	$190,407	$206,154	$141,225	$149,420	$146,293	$129,018	$105,029	$90,567	$59,808
75	$239,611	$224,621	$205,596	$222,635	$156,143	$161,699	$161,528	$136,731	$116,025	$144,063	$71,029
90	$277,644	$234,814	$231,713	$236,959	$166,371	$169,541	$170,851	$142,434	$131,468	$167,558	$74,875

Table S8a. Nine-month Salaries, 48 Responses of US CS Public With Tenure-Track Faculty >30, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	21	22	22	25	40	12	11	15	19	27
Indiv	91	66	77	73	501	34	30	61	77	274
10	$93,339	$89,848	$93,302	$88,154	$93,491	$85,422	$79,000	$68,680	$66,082	$75,620
25	$99,922	$101,511	$99,239	$96,800	$101,927	$87,577	$88,306	$75,930	$80,324	$80,780
50	$124,511	$111,056	$112,181	$105,000	$111,663	$92,023	$95,732	$91,536	$84,146	$90,467
75	$151,945	$123,821	$121,211	$118,900	$132,593	$117,187	$100,043	$104,902	$95,235	$100,260
90	$185,900	$151,398	$146,175	$138,178	$156,632	$138,613	$111,451	$119,933	$102,476	$120,508

Table S9. Nine-month Salaries, 9 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	8	3	8	9	8	7	9	8	8	1	2
Indiv	21		21	50	17	30	47	34	60		
10											
25	$163,534		$177,043	$169,927	$128,392	$133,523	$137,844	$121,438	$95,267		
50	$199,315		$189,678	$185,622	$137,793	$146,520	$140,305	$130,625	$96,965		
75	$262,870		$217,418	$218,500	$146,305	$159,916	$151,330	$136,081	$107,177		
90											

Table S9a. Nine-month Salaries, 9 Responses of US CS Private With <=20 Tenure-Track Faculty, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	4	5	6	7	8	0	2	1	0	2
Indiv	12	9	15	15	51					
10										
25				$93,955	$97,253					
50	$130,469	$101,765	$96,902	$98,604	$100,434					
75				$111,048	$109,908					
90										

Table S10. Nine-month Salaries, 14 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	14	12	10	14	10	$12	13	14	14	5	7
Indiv	68	53	38	159	29	55	84	96	127	11	49
10	$179,431	$170,267	$171,823	$178,617	$123,232	$133,668	$133,915	$119,976	$92,436		
25	$186,484	$196,774	$180,349	$181,084	$132,253	$147,222	$137,862	$124,046	$94,817		$55,296
50	$218,523	$211,214	$189,678	$211,658	$138,949	$154,227	$151,330	$132,823	$101,157	$84,500	$70,294
75	$250,968	$223,392	$213,288	$218,311	$148,727	$163,708	$161,540	$138,555	$127,432		$74,179
90	$270,638	$255,275	$236,967	$237,456	$159,625	$171,493	$169,275	$144,708	$134,815		

Table S10a. Nine-month Salaries, 14 Responses of US CS Private With 15 < Tenure-Track Faculty <=30, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	5	7	9	7	13	1	4	3	5	7
Indiv	18	13	26	14	89		5		11	38
10					$92,867					
25		$116,683	$96,317	$88,839	$96,317					$86,400
50	$130,438	$137,727	$120,322	$106,678	$112,663		$108,117		$92,500	$98,516
75		$146,698	$131,250	$111,809	$136,266					$109,645
90					$143,768					

Table S11. Nine-month Salaries, 30 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	27	27	25	30	19	27	28	30	29	10	15
Indiv	233	193	189	630	88	229	318	427	478	66	204
10	$179,972	$167,164	$149,203	$161,935	$118,298	$128,652	$129,510	$116,502	$92,722	$71,000	$51,074
25	$197,604	$189,726	$178,165	$182,671	$133,446	$151,350	$142,519	$126,927	$99,911	$88,844	$55,296
50	$246,071	$212,515	$205,000	$219,650	$146,557	$161,540	$160,788	$140,568	$119,319	$112,480	$72,635
75	$260,601	$235,157	$236,533	$244,141	$160,996	$171,500	$170,469	$146,265	$135,811	$158,788	$75,500
90	$283,595	$254,486	$268,382	$276,760	$167,960	$182,838	$178,165	$159,465	$145,192	$178,750	$79,756

Table S11a. Nine-month Salaries, 30 Responses of US CS Private With Tenure-Track Faculty >20, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	12	12	16	13	24	4	7	8	10	17
Indiv	65	22	62	106	321	9	8	24	34	157
10	$95,949	$92,811	$93,770	$90,805	$93,990				$73,287	$81,446
25	$126,824	$115,656	$106,827	$108,200	$111,043		$89,151	$92,551	$88,350	$89,490
50	$144,655	$127,354	$130,212	$120,550	$134,130	$115,550	$118,017	$102,271	$92,351	$99,911
75	$151,936	$140,135	$133,829	$128,791	$143,561		$129,142	$118,348	$106,625	$119,378
90	$157,050	$158,790	$150,607	$132,784	$151,656				$131,029	$139,546

Table S12. Nine-month Salaries, 39 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	34	34	31	37	29	36	37	37	35	11	10
Indiv	216	174	217	637	117	264	396	414	461	50	100
10	$154,125	$152,145	$146,575	$154,237	$117,738	$119,504	$119,070	$105,021	$75,123	$81,859	$51,377
25	$169,327	$161,208	$162,536	$172,395	$122,910	$125,496	$127,328	$111,480	$83,969	$111,681	$55,609
50	$193,816	$194,662	$188,800	$192,761	$132,401	$138,046	$135,315	$118,805	$95,926	$126,912	$58,148
75	$220,041	$216,286	$200,046	$209,651	$148,035	$149,952	$149,522	$130,217	$105,793	$174,539	$67,262
90	$247,180	$230,922	$228,833	$227,708	$156,504	$163,532	$160,379	$136,369	$114,860	$186,636	$68,678

Table S12a Nine-month Salaries, 39 Responses of US CS Public In Large City or Suburbs, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	16	15	18	21	31	11	10	8	17	18
Indiv	51	36	50	56	316	33	22	34	47	145
10	$84,488	$92,328	$76,086	$75,446	$80,111	$70,202	$69,701		$66,165	$70,054
25	$105,780	$94,685	$89,162	$84,000	$85,702	$73,593	$75,252	$77,422	$69,862	$74,738
50	$114,237	$107,611	$98,976	$93,114	$102,159	$87,586	$90,251	$95,831	$82,186	$85,195
75	$133,947	$112,424	$106,248	$105,000	$110,429	$104,384	$101,029	$102,563	$95,000	$94,986
90	$163,334	$135,881	$129,087	$114,462	$134,132	$133,078	$108,564		$98,847	$101,763

Table S13. Nine-month Salaries, 24 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	19	20	20	24	18	22	24	24	24	7	5
Indiv	164	125	101	400	60	122	186	257	252	29	21
10	$168,341	$151,018	$153,592	$158,128	$114,922	$114,249	$118,070	$104,770	$82,600		
25	$183,199	$166,367	$164,090	$168,296	$120,527	$127,066	$128,952	$110,492	$87,915	$66,049	
50	$210,922	$189,299	$177,743	$191,156	$135,004	$143,548	$143,405	$124,012	$97,683	$90,567	$71,730
75	$233,755	$206,284	$195,871	$212,896	$151,541	$153,042	$156,123	$134,930	$107,544	$95,562	
90	$275,499	$216,846	$226,313	$229,702	$162,159	$164,048	$168,691	$145,407	$142,084		

Table S13a. Nine-month Salaries, 24 Responses of US CS Public In Midsize City or Suburbs, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	12	12	10	16	20	7	4	8	10	17
Indiv	52	28	31	38	159	12	10	13	24	93
10	$88,598	$81,176	$80,597	$80,662	$83,867				$63,431	$71,036
25	$96,867	$94,548	$89,712	$86,412	$94,715	$76,060		$74,540	$78,743	$80,154
50	$112,362	$109,884	$100,482	$97,102	$101,327	$86,570	$98,037	$82,617	$82,442	$88,195
75	$133,093	$127,844	$116,436	$108,128	$116,221	$106,170		$102,061	$86,861	$96,922
90	$181,892	$151,341	$133,892	$140,422	$164,783				$96,400	$119,299

Table S14. Nine-month Salaries, 32 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	22	26	26	32	22	26	31	31	31	14	14
Indiv	135	126	117	417	79	128	238	352	340	85	64
10	$139,969	$134,416	$136,694	$135,654	$109,521	$110,493	$112,258	$100,000	$70,542	$53,035	$48,241
25	$156,526	$145,684	$151,870	$147,970	$116,472	$114,361	$117,516	$101,468	$76,495	$62,334	$49,580
50	$192,144	$171,695	$168,535	$169,945	$129,247	$124,882	$129,753	$115,419	$90,467	$77,507	$58,161
75	$218,438	$202,195	$193,410	$196,854	$145,516	$157,000	$148,700	$129,745	$100,179	$88,981	$69,380
90	$239,390	$231,378	$201,881	$217,113	$153,107	$164,002	$167,020	$140,118	$119,854	$147,364	$74,257

Table S14a. Nine-month Salaries, 32 Responses of US CS Public in Small City, Town, or Rural, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	9	9	11	14	25	10	8	9	12	20
Indiv	23	23	27	36	189	19	16	32	43	151
10			$76,000	$73,871	$76,232	$60,021			$60,774	$64,456
25	$75,519	$80,594	$88,775	$78,120	$85,000	$67,940	$76,917	$68,277	$70,830	$70,593
50	$94,977	$91,157	$110,652	$84,366	$96,526	$86,956	$84,113	$70,295	$81,013	$83,703
75	$99,922	$117,410	$117,416	$91,968	$123,391	$92,593	$93,951	$89,700	$85,001	$91,350
90			$122,900	$117,358	$131,408	$104,362			$97,313	$103,001

Table S15. Nine-month Salaries, 26 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	22	18	21	26	20	23	25	26	24	8	12
Indiv	153	123	157	448	84	188	272	341	421	63	162
10	$177,194	$163,037	$160,105	$166,110	$118,306	$132,955	$130,835	$114,362	$92,436		$50,324
25	$188,045	$193,587	$180,625	$181,497	$128,392	$148,204	$137,862	$124,177	$95,864	$99,239	$55,943
50	$219,132	$215,248	$205,110	$215,768	$142,470	$158,708	$155,845	$137,942	$108,952	$112,480	$72,470
75	$264,587	$235,635	$226,600	$230,897	$155,509	$170,549	$166,975	$145,538	$130,432	$149,241	$76,072
90	$278,770	$299,559	$261,855	$244,380	$167,155	$175,797	$176,760	$155,795	$142,131		$79,504

Table S15a. Nine-month Salaries, 26 Responses of US CS Private in Large City or Suburbs, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 v	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	12	11	15	14	21	3	7	8	7	12
Indiv	60	21	59	102	297		9	25	24	124
10	$104,322	$96,041	$92,899	$89,971	$94,137					$46,183
25	$124,621	$108,953	$97,353	$97,326	$97,541		$56,600	$91,924	$91,250	$88,368
50	$136,529	$123,107	$120,322	$117,984	$131,430		$118,017	$102,271	$106,250	$99,214
75	$151,936	$138,650	$131,301	$127,843	$136,266		$129,142	$118,348	$115,250	$119,265
90	$157,050	$153,823	$150,969	$132,325	$145,108					$123,313

Table S16. Nine-month Salaries, 13 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	13	12	12	13	7	11	12	12	13	3	5
Indiv	101	78	53	232	21	71	93	120	117		49
10	$170,259	$169,514	$137,714	$159,753		$129,150	$133,815	$119,084	$94,649		
25	$191,411	$183,140	$148,046	$178,858	$136,431	$133,523	$138,908	$125,865	$102,403		
50	$252,600	$211,617	$189,348	$220,558	$146,201	$161,540	$160,116	$138,076	$112,663		$74,733
75	$260,160	$234,857	$232,619	$246,194	$152,383	$170,728	$168,364	$142,627	$135,811		
90	$284,492	$251,090	$269,622	$270,936		$173,375	$171,142	$147,268	$144,087		

Table S16a. Nine-month Salaries, 13 Responses of US CS Private in Other than Large City, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	4	6	7	6	11	1	2	1	3	7
Indiv	17	10	18	19	75					42
10					$98,464					
25			$95,681		$107,533					$91,016
50	$140,350	$114,947	$108,851	$107,780	$121,500					$94,400
75			$130,345		$140,805					$116,758
90					$182,619					

Table S17. Nine-month Salaries, 4 Responses of 36 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	4	3	4	3	4	4	4	4	2	1
Indiv	43	27		101		29	34	44	37		
10											
25											
50	$226,286	$180,588		$209,379		$135,809	$133,994	$124,044	$103,341		
75											
90											

Table S17a. Nine-month Salaries, 4 Responses of 34 US Computer Engineering Departments, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	2	2	0	1	4	0	1	2	1	3
Indiv					30					
10										
25										
50					$106,875					
75										
90										

Table S18. Nine-month Salaries, 15 Responses of 23 US Information Departments, Percentiles from Department Averages

	Full Professor				Associate			Assistant	Non-Tenure Track		
	In rank 16+ yrs	In rank 8-15 yrs	In rank 0-7 years	All years in rank	In rank 8+ years	In rank 0-7 years	All years in rank		Teach	Research	Postdoc
Depts	10	14	14	15	15	15	15	15	14	4	6
Indiv	62	71	54	187	65	96	161	189	250	16	34
10	$134,070	$162,084	$143,284	$156,076	$117,747	$118,377	$125,765	$108,840	$80,242		
25	$171,646	$176,480	$162,603	$176,368	$122,229	$125,771	$127,305	$110,986	$88,526		
50	$191,787	$186,513	$181,616	$182,124	$136,185	$133,661	$132,170	$120,688	$99,508	$90,282	$67,500
75	$206,415	$194,088	$206,690	$198,420	$151,974	$145,552	$148,427	$128,044	$109,626		
90	$219,140	$205,239	$235,093	$214,013	$158,046	$149,841	$159,862	$133,941	$115,134		

Table S18a. Nine-month Salaries, 15 Responses of 19 US Information Departments, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	8	7	6	8	14	0	1	2	4	7
Indiv	28	12	25	32	203				7	47
10					$84,278					
25	$96,385	$92,749		$84,386	$92,008					$79,078
50	$103,870	$96,451	$105,935	$89,639	$101,442				$82,700	$84,301
75	$115,268	$110,670		$95,674	$111,763					$92,299
90					$115,531					

Table S19. Twelve-month Salaries, 10 Responses of 34 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	9	9	10	10	9	10	10	10	10	1	5
Indiv	74	62	53	189	37	71	108	118	100		68
10			$173,460	$181,580		$134,959	$142,862	$117,131	$88,625		
25	$197,189	$180,064	$188,559	$190,243	$151,833	$142,012	$148,740	$123,448	$103,202		
50	$215,298	$214,043	$202,991	$206,345	$187,237	$153,994	$167,291	$142,260	$110,030		$61,030
75	$244,566	$222,219	$214,370	$221,960	$191,745	$175,585	$176,708	$158,695	$133,619		
90			$220,873	$237,433		$184,372	$195,479	$180,012	$145,233		

Table S19a. Twelve-month Salaries, 10 Responses of 35 Canadian Departments, Percentiles from Department Averages

	Teaching Professor					Other Instructor				
Non-Tenure Track	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years	Teaching 9+ years	Teaching 6-8 years	Teaching 3-5 years	Teaching <3 years	All years
Depts	5	3	4	4	8	0	0	2	3	5
Indiv	26		8	10	74					26
10										
25					$103,379					
50	$150,720		$111,358	$133,168	$130,288					$95,199
75					$144,704					
90										

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

	US (CS, CE, and Info Combined)						Canadian					
	Tenure-Track	Teaching Prof	Other Instructor	Non-ten Teach All	Non-ten Research	Postdoc	Tenure-Track	Teaching Prof	Other Instructor	Non-ten Teach All	Non-ten Research	Postdoc
Depts	50	25	9	32	6	14	4	2	1	3	0	1
Indiv	137	53	25	78	7	53	6	2	2	4	0	9
10	$105,600	$81,400	$80,644	$80,700	$31,440	$44,370	$108,711	$86,948	$85,346	$85,409		$53,066
25	$118,000	$85,000	$82,840	$85,000	$37,200	$58,500	$119,317	$87,607	$85,960	$86,116		$55,000
50	$128,000	$92,867	$90,000	$90,500	$82,500	$69,342	$144,000	$88,705	$86,982	$87,768		$60,000
75	$140,000	$105,000	$102,500	$104,375	$105,000	$78,000	$152,500	$89,802	$88,005	$89,495		$65,000
90	$157,640	$122,800	$116,273	$122,300	$152,000	$83,918	$155,700	$90,461	$88,618	$90,338		$73,000

Table S21. Change in Salary Median for Departments that Reported in Both 2022 and 2023

	US CS	US CE	US I	Canadian
Departments	133	4	14	10
Full Profs	4.00%	11.00%	3.60%	3.50%
Assoc. Profs.	3.20%	8.00%	3.70%	2.20%
Asst. Profs.	4.30%	6.00%	1.60%	4.50%
Teaching Prof	6.40%	23.30%	3.60%	7.30%
Other Instructors	-9.30%	20.50%	-6.80%	43.80%
Research faculty	-1.10%	6.80%	12.90%	-7.80%
Post doctorates	4.00%	11.00%	3.60%	3.50%

Table S22. Median value for an adjunct teaching a single course.

Group	Median PhD teaching	N PhD teaching	Median PhD teaching	N PhD teaching	Median MS teaching	N MS teaching	Median MS teaching	N MS teaching
US CS	$7,500	84	$7,500	75	$7,000	77	$7,150	64
US CE	--	2	--	2	--	2	--	2
US IN	$5,712	11	$6,800	11	$5,614	10	$5,399	9
Canadian	$10,000	6	$10,000	5	$9,000	5	$9,000	3
US CS Public	$7,058	62	$6,939	56	$6,500	59	$6,378	49
US CS Private	$9.55	22	$11,149	19	$9.55	18	$10,000	15
Pub large city	$6,515	32	$6,515	30	$6,500	31	$6,276	28
Pub mid city	$8,000	12	$7,500	10	$7,500	10	$7,000	7
Pub small/rurl	$7,308	18	$7,750	16	$7,058	18	$6,250	14
Priv large city	$10,000	13	$11,574	12	$9,548	12	$10,227	10
Private other	$8,500	9	$8,000	7	$12,250	6	$7,500	5

Table S23. Adjunct rate adjustments.

Group	% Adj Time at Dept	% Adj Expertise
US CS	33%	42%
US CE	0%	0%
US IN	50%	36%
CAN	0%	25%
US CS Pub	28%	36%
US CS Priv	45%	50%

When viewed relative to faculty size, salaries tend to be higher for larger departments at both public and private institutions (perhaps best seen in Figures S1-S9). This pattern holds for all tenure-track ranks and both subclasses of teaching faculty. There is not enough data about research faculty and postdocs to do substantive analysis by department size.

The median of the average salaries at U.S. I departments tends to be somewhat lower than those at U.S. CS departments at all tenure-track faculty ranks, though for assistant professors the median is in between those for public and private institutions. At U.S.

Table S24. Other reasons for adjunct rate adjustments.

# Depts	Reason
8	Course enrollment or credit hours
3	Collective bargaining agreement or defined fee schedule
1	Prior research or industry experience
1	Prior teaching experience at other institutions
1	Promotion within ranks of adjunct or other admin factors
1	Merit raises, positive course evaluation and teaching observations
0*	Individual negotiated rates
0*	Demand vs. availability for the subject
0*	Course difficulty/level

* Mentioned in previous years but not listed this year

CE departments, the medians are higher than those at U.S. CS departments for full professors, lower for associate professors, and similar for assistant professors.

Our analyses of faculty salary changes from one year to the next uses 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 in one year and in the other year reported them by years in rank, we do not disaggregate salary changes by years in rank for full professors and associate professors in the year-to-year comparison. Similarly, we do not disaggregate teaching faculty by years in rank in the year-to-year comparison, though we do distinguish Teaching Professors from Other Instructors.

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 that reported data in both years is indicated in parenthesis at the top of each column. The table indicates that the median of the average salaries for full professors at the 124 departments that reported both this year and last year was 3.8 per cent higher as of January 1, 2024 than was the median of the average full professor salaries as of January 1, 2023 from these same 124 departments. The median of the average salaries for associate professors in these departments rose by 4.4 percent this year, and that for assistant professors also rose by 4.4 percent. Each of these changes was lower than the corresponding change reported last year.

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 a promotion causes an individual faculty member to move from one rank to another. Thus, a department with a small number of faculty members at 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 Information departments for which we have both last year's and this year's data, the values in those columns are considerably more volatile; this is in evidence in several of the entries in Table S21.

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

CRA Taulbee Survey 2023

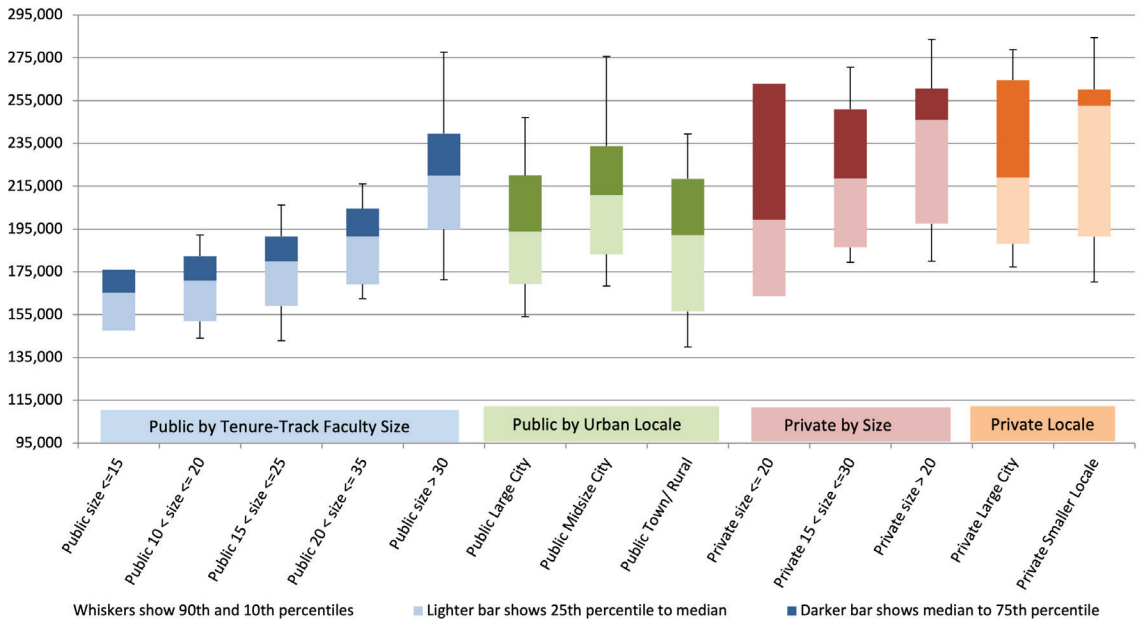


Figure S2. US CS Department Average Salary, Full Professor in Rank 8-15 Years

CRA Taulbee Survey 2023

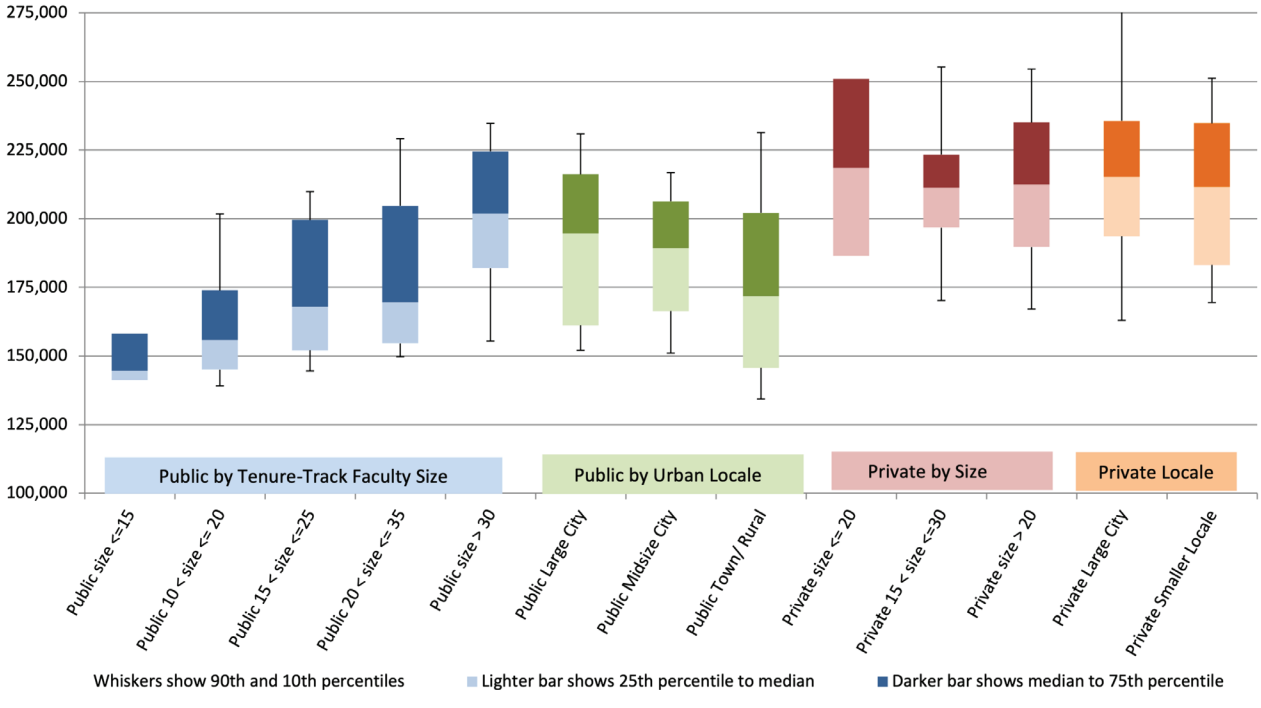


Figure S3. US CS Department Average Salary, Full Professor in Rank 0-7 Years

CRA Taulbee Survey 2023

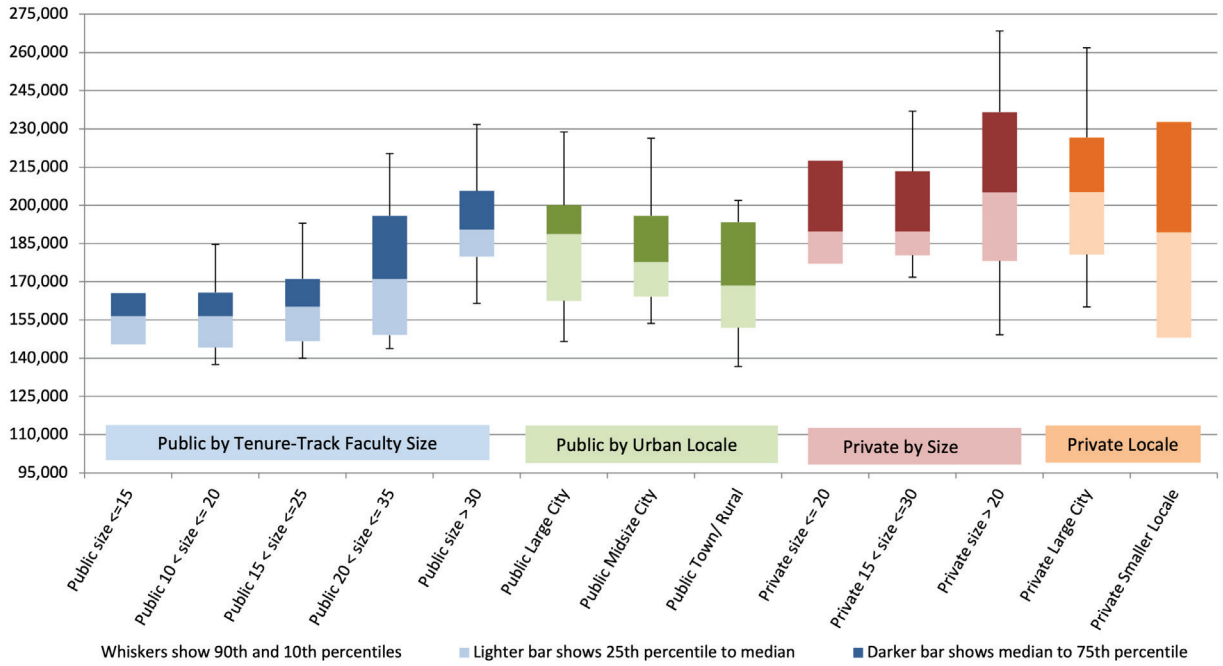


Figure S4. US CS Department Average Salary, Associate Professor in Rank 8+ Years

CRA Taulbee Survey 2023

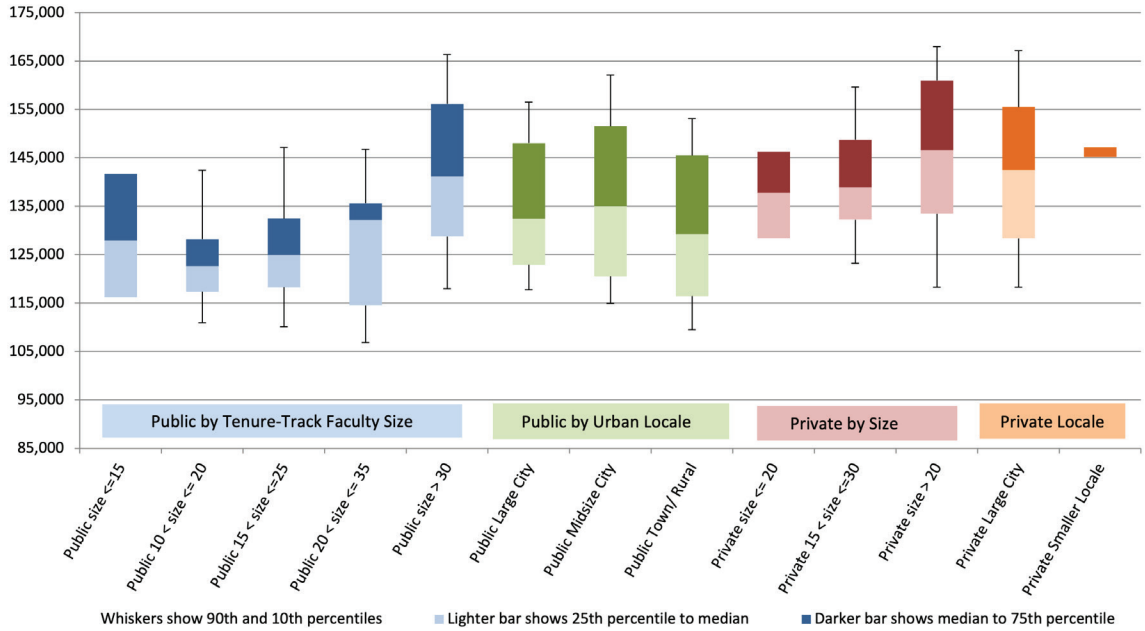


Figure S5. US CS Department Average Salary, Associate Professor in Rank 0-7 Years

CRA Taulbee Survey 2023

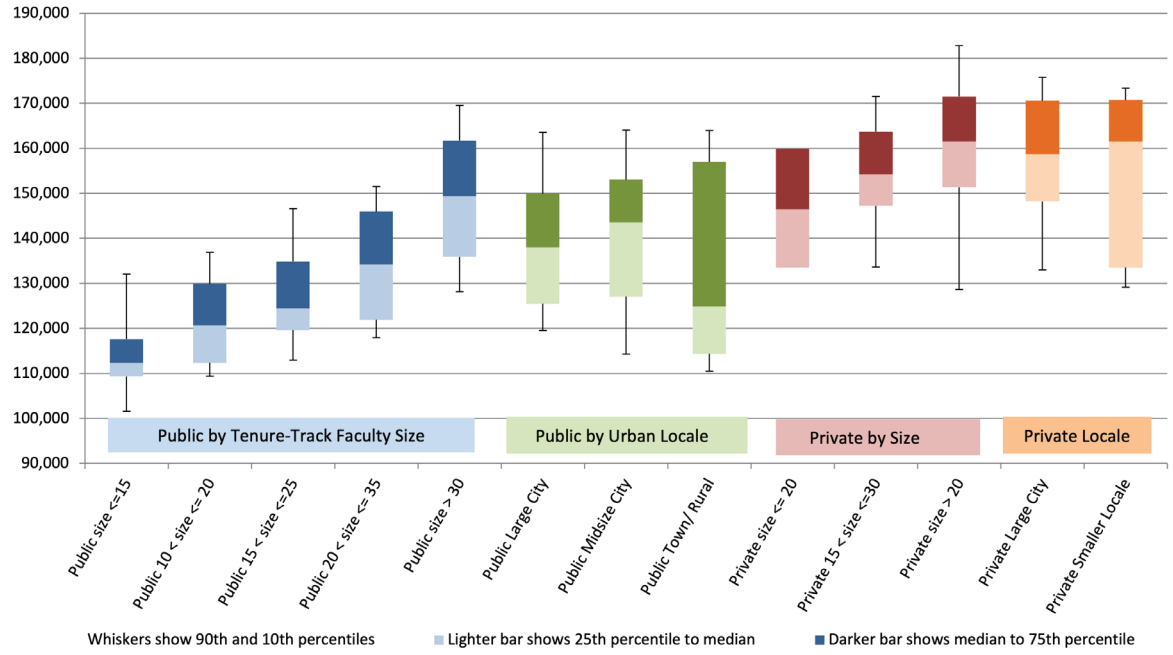


Figure S6. US CS Department Average Salary, Assistant Professor

CRA Taulbee Survey 2023

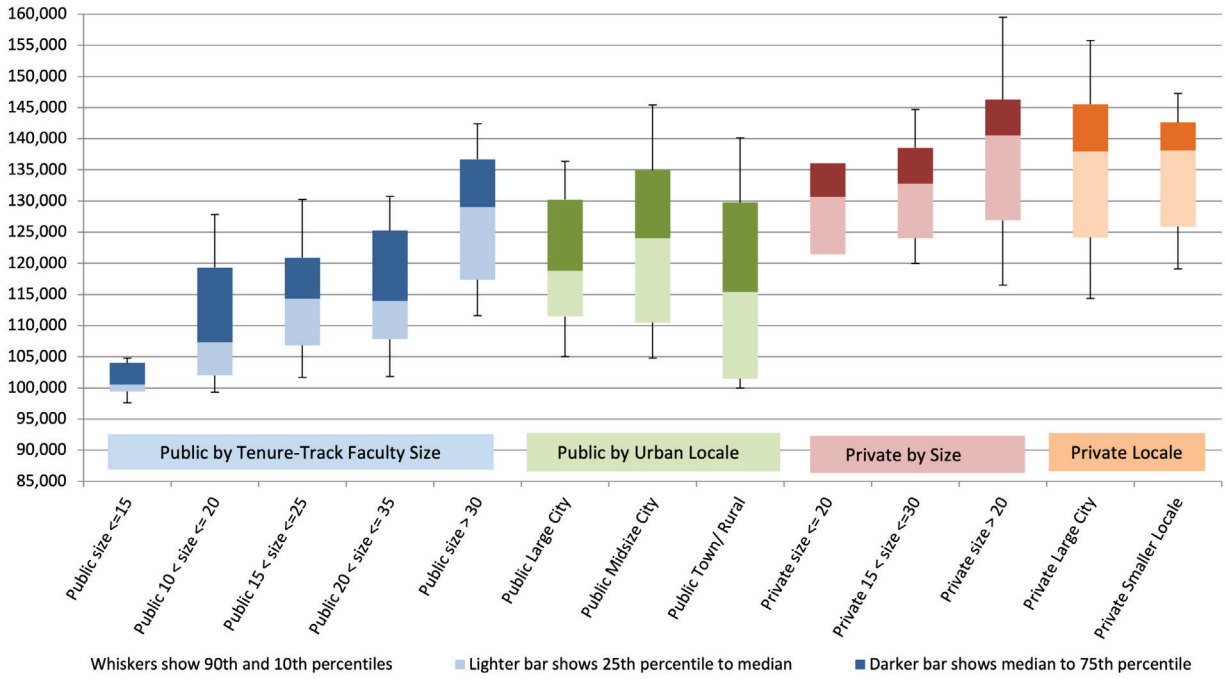


Figure S7. US CS Department Average Salary, Non-Tenure Track Teaching Faculty

CRA Taulbee Survey 2023

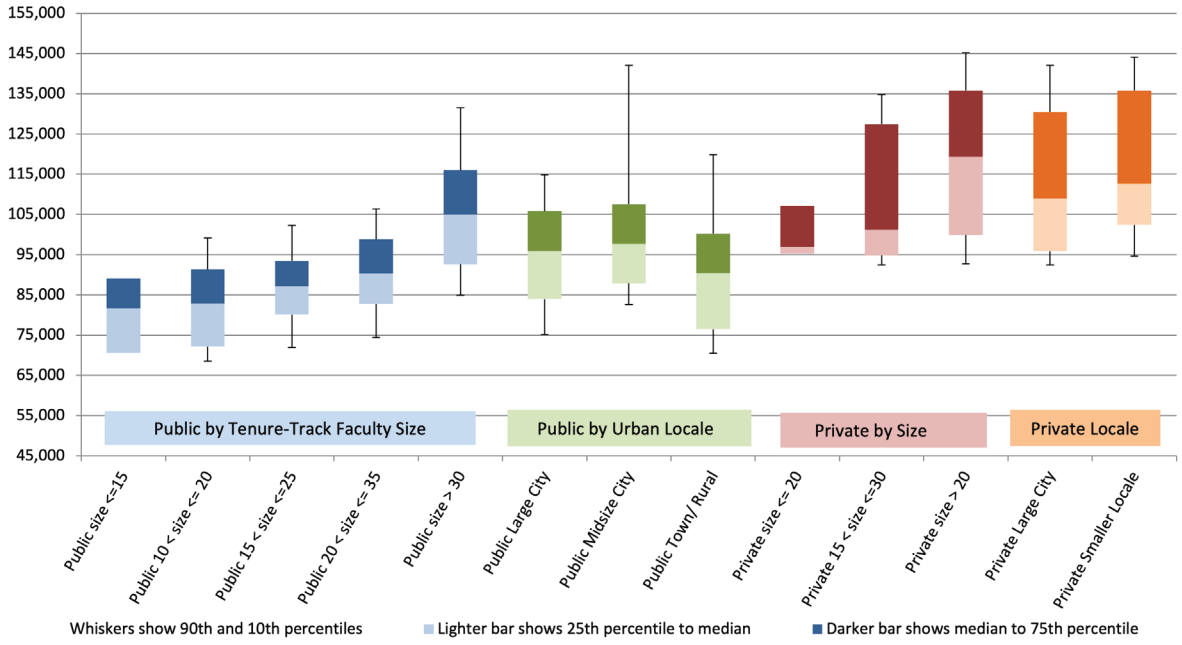


Figure S8. US CS Department Average Salary, Non-Tenure Track Research Faculty

CRA Taulbee Survey 2023

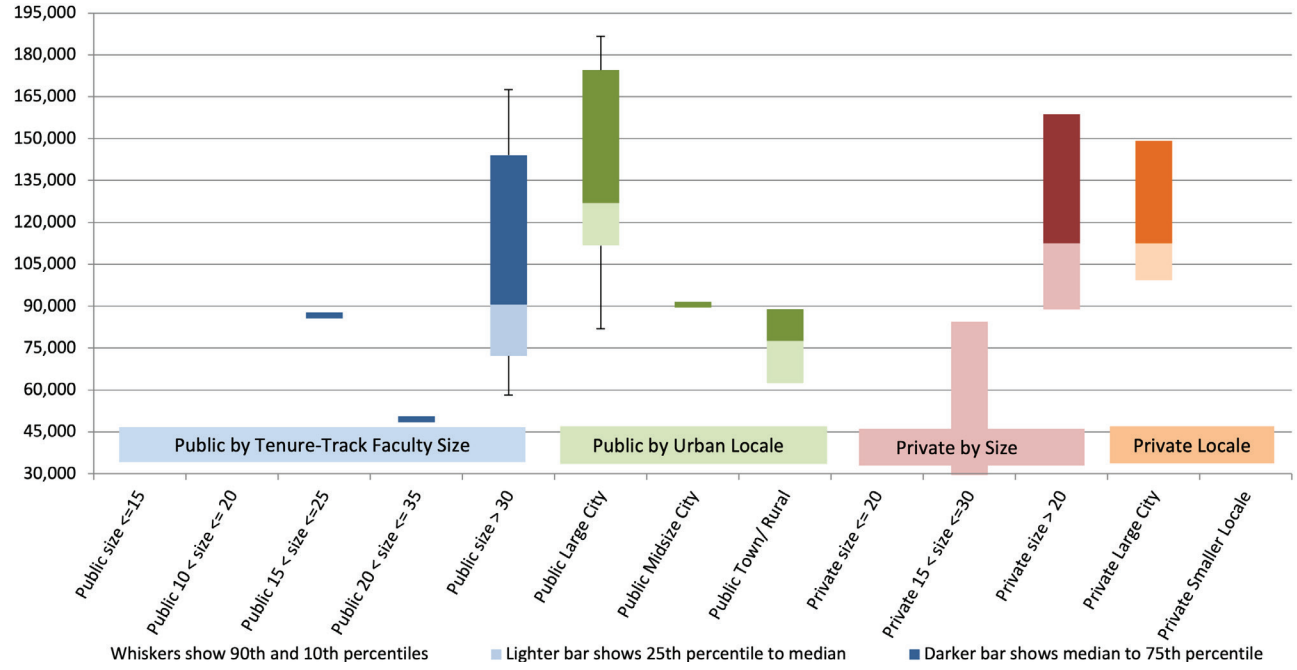
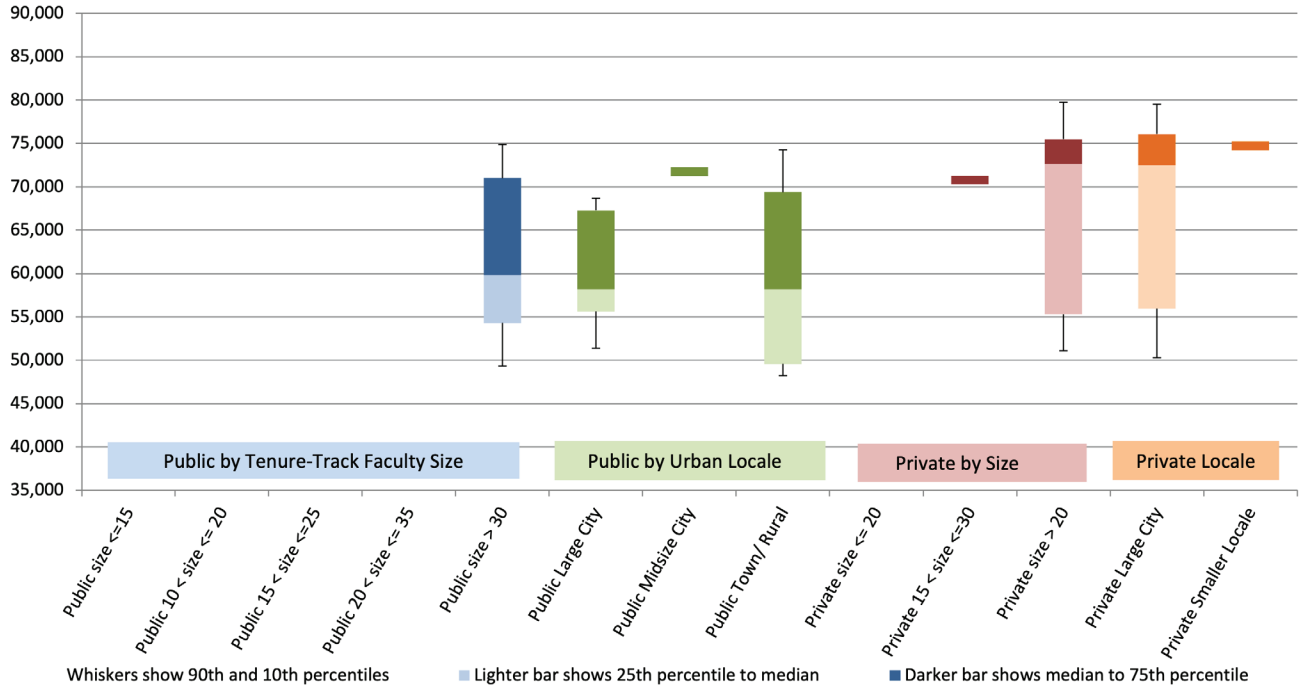


Figure S9. US CS Department Average Salary, Postdoctorates

CRA Taulbee Survey 2023



For new Ph.D.s in tenure-track positions at U.S. computer science, computer engineering, and I-school departments the median of the average 9-month salaries was $128,700, an increase of less than one per cent over last year (Table S20). The median of the average 12-month salaries at Canadian institutions was $118,049 CDN. This also constitutes an increase of a little less than one percent compared to last year. However, only five institutions reported such data and only four did so last year, so it is not clear how representative this value is across the population of Canadian doctoral-granting institutions.

In addition to salary data about full-time faculty, we also requested single-course salary averages for adjunct faculty, based on a) the level of the course (graduate or undergraduate) and b) whether or not the adjunct faculty member has a doctoral degree. The results are in Table S22. The median of the average salaries for adjuncts was $7,500 for the 84 U.S. CS departments who provided salary information about those adjuncts who had PhDs and taught an undergraduate course, and also was $7,500 for the 75 departments who provided information about adjuncts with a PhD who taught a graduate course. Adjunct salaries again were higher at private institutions than at public institutions, similar to the situation for other faculty salaries. Within public institutions, large cities tended to have lower adjunct salaries than mid-sized and smaller cities or rural locations. Also of note is that, at U.S. CS departments in public institutions, the median of the average salaries among adjuncts was slightly higher for teaching an undergraduate course than for teaching a graduate course, whether the adjunct had a doctoral or master's degree. However, both the undergraduate and graduate course median average salaries at public institutions for those with master's degrees were below the respective median averages for adjuncts with Ph.D.s. At private institutions, the median average salary for teaching undergraduate courses was the same whether the adjunct had a master's or Ph.D).

At U.S. CS departments, expertise continues to be more likely than longevity in the department to impact adjunct faculty salary. However, this year the reverse was true at U.S. I departments; last year longevity and expertise were cited by an equal number of I

departments. In U.S. CS departments, both longevity and expertise are more likely to impact salaries at private institutions than at public institutions. This also held true last year (Table S23). Other than longevity and expertise, the most commonly cited reason for differences in adjunct rates per course was the difference in course credit hours or course enrollment (Table S23a).

Concluding Observations

The results of this year's survey indicate continued strong productivity among the doctoral-granting departments. The number of graduates at each degree level was at an all-time high in 2022-23 and, for the most part, overall enrollment in the programs showed increases. Among U.S. CS institutions, average bachelor's enrollment in the departments has now been increasing for 16 consecutive years. The departments continue to hire many new teaching faculty to help keep pace with the enrollment growth, though tenure-track faculty size also increased somewhat.

We have concerns about the declining response rate to the survey, as it impacts the reliability of conclusions that we draw. We also are experiencing more departments not disaggregating degree and enrollment data by gender and race/ethnicity. Since these diversity characteristics are very important to the computing community, we hope that this situation is not going to persist.

Participating CS, CE, I and Canadian Departments

U.S. CS Public (105):

Arizona State, Auburn, Augusta, Binghamton, Boise State, Clemson, College of William & Mary, Colorado School of Mines, Colorado State, Florida International, Florida State, George Mason, Georgia Tech, Georgia State*, Indiana University Purdue University Indianapolis, Indiana, Iowa State, Kansas State, Kent State, Michigan State, Michigan Technological University, Mississippi State, Montana State, Naval Postgraduate School, New Jersey Institute of Technology, New Mexico State, New Mexico Tech, North Carolina State, North Dakota State, Ohio State, Old Dominion, Oregon State, Pennsylvania State, Portland State, Purdue, Rutgers, Stony Brook (SUNY), Temple, Texas A&M, Texas State, Texas Tech, University at Buffalo, Universities of: Alabama (Birmingham and Tuscaloosa), Arizona, Arkansas, Arkansas at Little Rock, California (Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, Santa Barbara, and Santa Cruz), Central Florida, Cincinnati, Colorado (Boulder), Delaware, Florida, Houston, Illinois (Chicago and Urbana-Champaign), Iowa, Kentucky, Louisiana at Lafayette, Louisville, Maryland (College Park and Baltimore County), Massachusetts (Amherst and Lowell), Memphis, Michigan, Minnesota, Missouri (Columbia), Nebraska (Omaha and Lincoln), Nevada (Las Vegas and Reno), New Hampshire, New Mexico, North Carolina (Chapel Hill and Charlotte), Oklahoma, Oregon, Rhode Island, South Carolina, South Florida, Southern Mississippi, Tennessee (Knoxville), Texas (Arlington, Austin, Dallas, El Paso, and San Antonio), Utah, Vermont, Virginia, Washington, Washington Human Centered Design & Engineering, Wisconsin (Madison), Virginia Tech, and Wright State.

U.S. CS Private (46):

Boston University, Brandeis, Brown, Carnegie Mellon, Case Western Reserve, Columbia, Cornell, DePaul, Drexel, Duke, Emory, Florida Institute of Technology, Harvard, Illinois Institute of Technology, Johns Hopkins, Lehigh, MIT, New York University, Northeastern, Northwestern, NYU Tandon School, Pace, Princeton, Rensselaer, Rice, Rochester Institute of Technology, Stanford, Stevens Institute of Technology, Toyota Technological Institute at Chicago, Tufts, Tulane, Universities of: Chicago, Denver, Notre Dame, Pennsylvania, Rochester, and Southern California, Washington in St. Louis, Worcester Polytechnic Institute, and Yale.

U.S. CE (6):

Boston University, Case Western Reserve, North Carolina State, Universities of Illinois (Urbana Champaign), Michigan, and Texas (Austin).

U.S. Information (16):

Cornell, Drexel, Indiana, Penn State, Syracuse, Universities of: Arizona, California (Berkeley), Cincinnati, Colorado (Boulder), Illinois (Urbana-Champaign), Maryland (College Park ISchool and Baltimore County), Michigan, North Carolina (Chapel Hill), Pittsburgh, and Washington.

Canadian (11):

Concordia, Dalhousiel, Queen's, Simon Fraser, Toronto Metropolitan, Universities of: British Columbia, Manitoba, Saskatchewan, Toronto, Victoria, Waterloo.

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[1] The title of the survey honors Orrin E. Taulbee of the University of Pittsburgh, who conducted these surveys for the Computer Science Board until 1984, with retrospective annual data going back to 1970.

[2] Information (I) programs included here are Information Science, Information Systems, Information Technology, Informatics, and related disciplines with a strong computing component. Surveys were sent to CRA members, the CRA Deans group members, and participants in the iSchools Caucus (www.ischools.org) who met the criteria of granting Ph.D.s and being located in North America. Other I programs who meet these criteria and would like to participate in the survey in future years are invited to contact survey@cra.org for inclusion.

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

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