ACM NDC Study: The 2015 Survey of Non-Doctoral Granting Departments in Computing

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In the winter/spring of 2015, ACM conducted the third annual ACM-NDC Study (a survey of "Non-Doctoral-Granting Departments in Computing"), intended to be an annual complement to the Computing Research Association (CRA) Taulbee Survey of Ph.D.-granting departments in computing [5]. ACM-NDC is funded by ACM (with generous support in the past from Google), and continues to be conducted with support from the CRA, AIS [1], and ACM SIGITE [2]. The survey comprises recent degrees, enrollments, faculty demographics and faculty salaries and includes gender and ethnic diversity characteristics of the faculty and of the students in the computing programs. The NDC Steering Committee comprises the authors of this article. As an annual study, NDC helps fill in gaps in data on non-Taulbee programs to present a more complete view of the academic landscape in computing and expand pipeline information on programs that produce candidates for Ph.D. programs as well as the private and public labor markets. The timely reporting of the survey's results provides the community with an early look at workforce-related facts and trends of importance to academic programs and those who rely on them. This article reports the results of the NDC survey, with comparisons and contrasts to data reported in the Taulbee Survey and, as appropriate, last year's NDC survey results.

The goals of ACM-NDC are to document trends in student enrollment, degree production, faculty demographics and salaries at not-for-profit U.S. academic institutions that grant bachelor's and/or master's degrees (but not doctoral degrees) in the five major computing disciplines: computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), and software engineering (SE). Diversity statistics and trends with respect to students and faculty are important features of this documentation.

The survey was distributed in February 2015 to qualifying programs identified through data in the Integrated Post-secondary Education Data System (IPEDS) [3]. This data are collected annually by the National Center for Education Statistics (NCES) from all U.S. institutions that participate in the federal financial aid programs [5]. This year the survey was distributed to 1063 academic units (departments, schools, or institutions) identified via IPEDS as offering at least one program in computing. In some cases, a single institution received multiple surveys if programs are housed in different schools or departments. Responses were received for 158 academic units (compared to 156 in 2013-14) and data were reported for 291 total programs (248 Bachelor's and 43 Master's), compared to 364 the previous year. We found that 140 out of the 158 responding academic units provided data on faculty (150 in 2013-14) and 92 provided faculty salary information (135 in 2013-14).

Although there was some drop-off in overall programs represented as well as faculty salary data, we remain optimistic that overall NDC awareness continues to grow. Much of our work in this latest wave was focused on migrating to a more robust and sustainable data collection platform, which offers a better user-experience as well as enhancements in benchmarking [4]. This delayed the start of the data collection process and compressed the amount of time respondents had to provide their data. It may also be worth noting that there was a marked increase in response from 2012-13 to 2013-14, and in 2014-15 we were able to sustain this level of participation at the academic unit level. The NDC committee is cognizant of some common challenges in requesting data from NDC institutions, such as pulling together requested information from multiple administrators, respondent bandwidth issues, and collecting salary data from smaller departments and private institutions. Some of these will be addressed in the fourth wave of NDC (2015-16) including moving up the annual launch from winter to fall. Moreover, as we learn more about the various "residents" of our NDC community and continue our ongoing efforts to build awareness and expectations, and to reduce the user burden of this demanding survey, we expect the response rate to grow.

The following is a preliminary summary of some key NDC findings. Since this is only the third year of NDC, data were used primarily for comparisons with Taulbee while longitudinal trend analysis is still premature. Furthermore, small response sizes in some parts of the survey make it difficult to draw hard conclusions from the data provided. In reading this report, one should consider the following points.

- In this report, we will use the term "academic unit" (or unit) for the administrative division responsible for one or more qualifying programs. We will use the term "program" to refer to a course of study leading to a degree in one of the computing disciplines: computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), or software engineering (SE).
- A given academic unit may offer multiple programs.
- Degree production (master's and bachelor's) refers to the previous academic year (2013-14).
- Data for current faculty as well as new students in all categories refer to the current academic year (2014-15) for which the survey is given.
- Total enrollment (master's and bachelor's) data are reported for both 2013-14 and 2014-15. However, it should be noted that due to platform changes, 2014-15 enrollment data come from academic units responding in 2014-15, while 2013-14 numbers come from last year's group of respondents.

BACHELOR'S DEGREE PRODUCTION AND ENROLLMENTS

As shown in Table B1A, the number of academic units responding to the bachelor's portion of the survey remained steady in comparison to last year (158 vs. 156). There was a lower percentage of public (38.0% vs. 43.1%) and master's granting (26.6% vs. 34.4%) institutions than in 2014 (Table B1B). The total number of degree programs offered by the responding units is 248, much lower than the 302 programs that were represented in the 2013-2014 survey. Table B2 presents a breakdown of programs by discipline and institution type. A higher percentage of programs identify as

TABLE B1B. BREAKDOWN OF ACADEMIC UNITS RESPONDING TO BACHELOR'S SECTION OF SURVEY

	Count	% of Total
Overall	158	
Public	60	38.0%
Private	98	62.0%
Master's	42	26.6%
Non-Master's	116	73.4%

TABLE B1A. SUMMARY OF ACADEMIC UNITS RESPONDING TO BACHELOR'S SECTION OF SURVEY

	Overall		Public		Private		Master's		Non-Master's	
	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total
Yes	158	14.9%	60	12.7%	98	16.6%	42	70.0%	116	11.6%
No	905	85.1%	414	87.3%	491	83.4%	18	30.0%	887	88.4%
Totals	**1,063**	100%	**474**	100%	**589**	100%	**60**	100%	**1,003**	100%

TABLE B2. SUMMARY OF PROGRAM OFFERINGS

	Overall				Public			Private			Master's			Non-Master's		
	N Units	N Programs	% of Total	% ABET	N Programs	% of Total	% ABET	N Programs	% of Total	% ABET	N Programs	% of Total	% ABET	N Programs	% of Total	% ABET
CS	140	161	64.9%	22.4%	60	60.6%	41.7%	101	67.8%	10.9%	46	57.5%	39.1%	115	68.5%	15.7%
CE	7	7	2.8%	85.7%	4	4.0%	75.0%	3	2.0%	100.0%	3	3.8%	66.7%	4	2.4%	100.0%
IS	39	43	17.3%	14.0%	14	14.1%	7.1%	29	19.5%	17.2%	12	15.0%	25.0%	31	18.5%	9.7%
IT	21	25	10.1%	4.0%	14	14.1%	7.1%	11	7.4%	0.0%	13	16.3%	7.7%	12	7.1%	0.0%
SE	11	12	4.8%	25.0%	7	7.1%	28.6%	5	3.4%	20.0%	6	7.5%	33.3%	6	3.6%	16.7%
Totals	**158**	**248**	100%	–	**99**	100%	–	**149**	100%	–	**80**	100%	–	**168**	100%	–

being CS than last year (64.9% vs. 56.6%) while the percentages of all other types of programs were lower. Of most significant difference were the percentages in CE (2.8% vs. 4.0%) and IT (10.1% vs. 14.6%). The disparity in number and types of programs from last year's survey necessitates that caution be used in drawing too many conclusions when comparing the results of the two surveys. In several tables, data from departments that responded in both years are presented and may be more representative of developing trends.

Also reported in Table B2 is the percentage of programs in each discipline and institution type that are ABET accredited. Computer engineering programs continue to report very high levels of accreditation (85.7%) and programs offered by master's granting institutions are more likely to be accredited than in non-master's granting institutions. Computer science programs are accredited more frequently at public institutions than private (41.7% vs. 10.9%), while IS programs are accredited at a much higher percentage of private institutions than public (17.2% vs. 7.1%) among this year's respondents.

Table B3A shows actual degree production in 2013-2014 and anticipated change in that production for 2014-2015 broken down by institution type. Anticipated increases of 21.7% and 15.9% in computer science and for all disciplines are lower than those data reported at Taulbee institutions (23.0% and 19.0%, respectively). Increases are anticipated to be higher at master's granting institutions both for computer science and over all discipline types. Anticipated increases were similar in public vs. private institutions.

For departments that responded both last year and this year, Table B3B includes actual degree production for 2012-2013 and 2013-2014 as well as anticipated production in 2014-2015, again broken down by institution type. Aggregate actual degree production over all disciplines by consecutive-year respondents increased at a greater rate than was reported by last year's consecutive-year respondents (16.3% vs. 11.4%) and at a greater rate than reported by Taulbee school consecutive-year respondents (12.1%). In CS, actual degree production increased, but at a lower rate than reported last year (11.8% vs. 12.7%) and at a lower rate than reported by Taulbee institutions (13.6%). Degree production in 2014-2015 is anticipated to have a double-digit percent increase in CS (16.4%) and over all disciplines (13.2%), with private institutions anticipating the largest increases (23.9% in CS and 21.5% over all disciplines).

Reported degree production and anticipated change appear by discipline in Table B4. For those departments responding in both 2014 and 2015, actual degree production increased in all

TABLE B3A. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY PROGRAM TYPE - ALL RESPONDENTS

	All Respondents													
	CS Only							All Disciplines						
	Number of Units	Number of Programs	2013-2014 actual	2013-2014 Average per Program	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % Change	Number of Units	Number of Programs	2013-2014 actual	2013-2014 Average per Program	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % Change
Public	44	49	1,124	22.9	1,360	27.8	21.0%	48	82	1,708	20.8	1,983	24.2	16.1%
Private	75	90	719	8.0	883	9.8	22.8%	88	136	1,049	7.7	1,212	8.9	15.5%
Master's	25	36	825	22.9	1,050	29.2	27.3%	32	65	1,346	20.7	1,576	24.2	17.1%
Non-Master's	94	103	1,018	9.9	1,193	11.6	17.2%	104	153	1,411	9.2	1,619	10.6	14.7%
NDC Overall	119	139	1,843	13.3	2,243	16.1	21.7%	136	218	2,757	12.6	3,195	14.7	15.9%
"Taulbee (US CS Depts)"	129 (122*)	NA**	11,140	86.4	12,960	106.2	23.0%	148 (140*)	NA**	16,010	108.2	18,150	128.7	19.0%

*Note: Taulbee CS data excludes departments from Canadian institutions and had fewer department report projected degree production than actual
**Note: Taulbee only provides averages per department

TABLE B3B. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY PROGRAM TYPE - UNITS RESPONDING BOTH YEARS

	Units Responding Both Years									
	CS Only									
	Number of Units	Number of Programs	2012-2013 actual	2012-2012 Average per Program	2013-2014 actual	2013-2014 Average per Program	2013-2014 Actual % Change	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % Change
Public	23	27	603	22.3	702	26.0	16.4%	782	29.0	11.4%
Private	48	60	448	7.5	473	7.9	5.6%	586	9.8	23.9%
Master's	15	22	450	20.5	523	23.8	16.2%	641	29.1	22.6%
Non-Master's	56	65	601	9.2	652	10.0	8.5%	727	11.2	11.5%
NDC Overall	71	87	1,051	12.1	1,175	13.5	11.8%	1368	15.7	16.4%
"Taulbee (US CS Depts)"	113	NA*	11,144	98.62	12,664	112.07	13.64%	NA**	NA**	NA**

	Units Responding Both Years									
	All Disciplines									
	Number of Units	Number of Programs	2012-2013 actual	2012-2012 Average per Program	2013-2014 actual	2013-2014 Average per Program	2013-2014 Actual % Change	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % Change
Public	25	50	924	18.5	1150	23.0	24.5%	1,248	25.0	8.5%
Private	52	88	612	7.0	637	7.2	4.1%	774	8.8	21.5%
Master's	16	36	704	19.6	842	23.4	19.6%	968	26.9	15.0%
Non-Master's	61	102	832	8.2	945	9.3	13.6%	1,054	10.3	11.5%
NDC Overall	77	138	1,536	11.1	1787	12.9	16.3%	2,022	14.7	13.2%
"Taulbee (US CS Depts)"	133	NA*	13,349	100.37	14,957	112.46	12.05%	NA**	NA**	NA**

*Note: Taulbee only provides averages per department
**Note: Taulbee does not report expected degrees for departments responding both years

TABLE B4. DEGREE PRODUCTION AND ANTICIPATED CHANGE BY DISCIPLINE

	All Respondents						
	N Units	N Programs	2013-2014 actual	2013-2014 Average per Program	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % change
NDC Overall	136	218	2,757	12.6	3,195	14.7	15.9%
CS	119	139	1,843	13.3	2,243	16.1	21.7%
CE	7	7	108	15.4	112	16.0	3.7%
IS	37	40	382	9.6	348	8.7	-8.9%
IT	17	20	333	16.7	362	18.1	8.7%
SE	11	12	91	7.6	130	10.8	42.9%

	Units Responding Both Years									
	N Units	N Programs	2012-2013 actual	2012-2013 Average per Program	2013-2014 actual	2013-2014 Average per Program	2013-2014 Actual % change	2014-2015 projected	2014-2015 Average per Program	2014-2015 Anticipated % change
NDC Overall	77	138	1,536	11.1	1,787	12.9	16.3%	2,022	14.7	13.2%
CS	71	87	1,051	12.1	1,175	13.5	11.8%	1,368	15.7	16.4%
CE	3	3	62	20.7	96	32.0	54.8%	96	32.0	0.0%
IS	23	26	129	5.0	159	6.1	23.3%	157	6.0	-1.3%
IT	13	15	234	15.6	299	19.9	27.8%	329	21.9	10.0%
SE	7	7	60	8.6	58	8.3	-3.3%	72	10.3	24.1%

disciplines except software engineering where a slight decrease was reported (-3.3%). The same departments anticipate increases in degree production in computer science, information technology and software engineering in 2014-2015 while expecting computer engineering to remain flat and information systems to decline slightly. Over all respondents, anticipated degree increases are very high in CS (21.7%) and software engineering (42.9%), and more modest in computer engineering (3.7%) and information technology (8.7%), while a decline in degrees is anticipated in information systems (-8.9%).

For the third year running, there was a higher percentage of females receiving degrees at NDC schools than was reported for Taulbee institutions (Table B5). The difference of 3.2% is similar to that reported in our 2013 report (2.9%) and higher than that reported last year (1.4%). Also of interest is that 17.9% is the highest rate of female degree recipients seen in the three-year history of NDC. Software engineering reports the lowest percentage of female degree recipients (4.4%). The percentage of females receiving degrees was much higher in private vs. public institutions in computer science, computer engineering, and information systems. Non-master's granting institutions report higher percentages of females than master's granting institutions in all disciplines except software engineering.

For the third year in a row, NDC schools report higher percentages than Taulbee institutions of Black/African-American (8.3% vs. 4.1%), and White (67.2% vs. 56.7%) students (Table B6). Percentages of Asian and Non-Resident students at NDC schools are much lower than those percentages reported in the Taulbee survey (12.1% vs. 20.8% and 4.7% vs. 8.3%, respectively).

Enrollment increases among departments responding in both 2013-2014 and 2014-2015 are in the double digits at all institution types (Table B7). These increases are much more

TABLE B5. BACHELOR'S DEGREES AWARDED BY GENDER, DISCIPLINE AND PROGRAM TYPE

	Male		Female		Total Known Gender	Gender Unknown	Grand Total	N Units	N Programs
CS Overall	1,553	82.2%	337	17.8%	1,890	89	1,979	128	148
CS Public	990	87.1%	146	12.9%	1,136	83	1,219	49	54
CS Private	563	74.7%	191	25.3%	754	6	760	79	94
CS Master's	694	88.0%	95	12.0%	789	83	872	27	38
CS Non-Master's	859	78.0%	242	22.0%	1,101	6	1,107	101	110
CS Taulbee	10,345	85.9%	1701	14.1%	12,046	182	12,228	NA	NA
CE Overall	55	78.6%	15	21.4%	70	38	108	7	7
CE Public	42	87.5%	6	12.5%	48	38	86	4	4
CE Private	13	59.1%	9	40.9%	22	0	22	3	3
CE Master's	38	84.4%	7	15.6%	45	38	83	3	3
CE Non-Master's	17	68.0%	8	32.0%	25	0	25	4	4
CE Taulbee	2,055	88.8%	259	11.2%	2314	25	2,339	NA	NA
IS Overall	300	78.7%	81	21.3%	381	1	382	37	40
IS Public	166	81.8%	37	18.2%	203	1	204	12	13
IS Private	134	75.3%	44	24.7%	178	0	178	25	27
IS Master's	146	79.3%	38	20.7%	184	1	185	12	12
IS Non-Master's	154	78.2%	43	21.8%	197	0	197	25	28
IT Overall	354	82.3%	76	17.7%	430	0	430	18	22
IT Public	274	82.0%	60	18.0%	334	0	334	8	11
IT Private	80	83.3%	16	16.7%	96	0	96	10	11
IT Master's	222	83.1%	45	16.9%	267	0	267	8	10
IT Non-Master's	132	81.0%	31	19.0%	163	0	163	10	12
SE Overall	87	95.6%	4	4.4%	91	0	91	11	12
SE Public	54	94.7%	3	5.3%	57	0	57	6	7
SE Private	33	97.1%	1	2.9%	34	0	34	5	5
SE Master's	79	95.2%	4	4.8%	83	0	83	5	6
SE Non-Master's	8	100.0%	0	0.0%	8	0	8	6	6
NDC Overall	2,349	82.1%	513	17.9%	2,862	128	2,990	146	229
Taulbee Overall	14,510	85.3%	2497	14.7%	17,007	230	17,237	NA	NA

TABLE B6. BACHELOR'S DEGREES AWARDED BY ETHNICITY (158 units)

	US Residents							Others				Total
	Hispanic/ Latino	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black/ African-American	White	2 or more races, non-Hispanic	Non-Resident	Total Ethnicity, Residency Known	U.S. Residency Race Unknown	Residency Unknown	Total
NDC Overall	118	13	281	12	193	1,563	36	110	2,326	218	393	2,937
	5.1%	0.6%	12.1%	0.5%	8.3%	67.2%	1.5%	4.7%	100.0%	–	–	–
CS	78	6	220	6	99	1,056	21	63	1,549	150	277	1,976
	5.0%	0.4%	14.2%	0.4%	6.4%	68.2%	1.4%	4.1%	100.0%	–	–	–
CE	9	0	11	0	4	41	4	1	70	0	38	108
	12.9%	0.0%	15.7%	0.0%	5.7%	58.6%	5.7%	1.4%	100.0%	–	–	–
IS	8	0	15	0	33	204	2	35	297	16	38	351
	2.7%	0.0%	5.1%	0.0%	11.1%	68.7%	0.7%	11.8%	100.0%	–	–	–
IT	21	7	32	5	56	181	9	10	321	52	38	411
	6.5%	2.2%	10.0%	1.6%	17.4%	56.4%	2.8%	3.1%	100.0%	–	–	–
SE	2	0	3	1	1	81	0	1	89	0	2	91
	2.2%	0.0%	3.4%	1.1%	1.1%	91.0%	0.0%	1.1%	100.0%	–	–	–
Taulbee Overall	1105	63	2982	36	586	8123	249	1189	14333	576	2328	17237
	7.7%	0.4%	20.8%	0.3%	4.1%	56.7%	1.7%	8.3%	100.00%	–	–	–

pronounced than reported for the corresponding respondent group last year for private institutions (12.2% vs. 8.2%) and non-master's granting institutions (11.2% vs. 5.0%) and may indicate that the enrollment boom experienced by other types of institutions has now arrived at these schools as well. Enrollment changes in the all respondents group paint a more variable picture of enrollment trends but, as pointed out above, should not be given much weight due to the very different makeup of the all respondents group in comparison to last year. The mean enrollment per CS department in 2013-2014 at NDC schools continued to remain small in comparison to the Taulbee institutions (109.1 vs. 501.9).

Table B8 presents the change in mean bachelor's and new major enrollment for the last year and breaks those statistics out by discipline. We will focus our discussion on those departments responding both years as they provide more reliable and interesting information. The mean enrollment per program increased in computer science (13.6%) and software engineering (11.7%), while declining the most in information systems (-10.5%). The mean number of new majors rose in computer science (4.1%) and information technology (1.2%), while declining the most in computer engineering (-33.3%). Also of note is that there has been a drop in the number of programs among these respondents, with two fewer computer science programs and one less information technology program among the group.

The percentage of new majors within the total enrollment of all responding programs appears in Table B9. Overall, 30.0% of enrollment is comprised of new majors, which is virtually unchanged from last year. The percentages in information systems and information technology are much higher than either of the two previous years (approximately 15% and 6%, respectively), while computer science and software engineering have remained steady.

TABLE B7. COMPUTER SCIENCE ENROLLMENT CHANGE BY PROGRAM TYPE

	All Respondents								Departments Responding Both Years				
	2013-2014			2014-2015					2013-2014		2014-2015		
	N Units	Headcount	Mean Enroll	N Units	Headcount	Mean Enroll	% Increase	N Units	Headcount	Mean Enroll	Headcount	Mean Enroll	% increase
NDC Overall	129	14,072	109.1	115	13,087	113.8	4.3%	70	7,441	106.3	8,264	118.1	11.1%
Public	52	10,488	201.7	41	8,840	215.6	6.9%	22	5,091	231.4	5,626	255.7	10.5%
Private	77	3,584	46.5	74	4,247	57.4	23.4%	48	2,350	49.0	2,638	55.0	12.2%
Master's	18	3,972	220.7	23	5,995	260.7	18.1%	14	3,582	255.9	3,977	284.1	11.0%
Non-Master's	111	10,100	91.0	92	7,092	77.1	-15.3%	56	3,859	68.9	4,287	76.6	11.2%
"Taulbee	129*	64,745	501.9	NA**	NA**	NA**	NA**	NA**	NA**	NA**	NA**	NA**	NA**

*Note: Number of departments responding to Taulbee.
**Note: Taulbee enrollment data is reported for previous year and for all repondents only

TABLE B8. ACTUAL ENROLLMENT CHANGE FROM PREVIOUS YEAR BY DISCIPLINE

	All Respondents			Units Responding Both Years		
	2013-2014	2014-2015	% Change in Mean per Program	2013-2014	2014-2015	% Change in Mean per Program
All Disciplines						
# units	152	130	-14.5%	76	76	0.0%
# programs	291	212	-27.1%	139	136	-2.2%
BS enrollment	22,701	17,789	7.6%	11,316	11,848	7.0%
New BS majors	6,129	5,092	14.0%	3,236	3,206	1.3%
CS						
# units	129	115	-10.9%	70	70	0.0%
# programs	164	135	-17.7%	88	86	-2.3%
BS enrollment	14,072	13,087	13.0%	7,441	8,264	13.6%
New BS majors	3,834	3,665	16.1%	2,161	2,198	4.1%
CE						
# units	11	7	-36.4%	3	3	0.0%
# programs	12	7	-41.7%	3	3	0.0%
BS enrollment	1,487	592	-31.8%	458	445	-2.8%
New BS majors	400	147	-37.0%	156	104	-33.3%
IS						
# units	47	35	-25.5%	22	22	0.0%
# programs	53	38	-28.3%	26	25	-3.8%
BS enrollment	2,025	1,236	-14.9%	798	687	-10.5%
New BS majors	518	425	14.4%	182	166	-5.0%
IT						
# units	38	17	-55.3%	13	13	0.0%
# programs	45	20	-55.6%	15	15	0.0%
BS enrollment	3,810	2,192	29.4%	2,251	2,041	-9.3%
New BS majors	1,094	642	32.0%	579	586	1.2%
SE						
# units	17	11	-35.3%	7	7	0.0%
# programs	17	12	-29.4%	7	7	0.0%
BS enrollment	1,307	682	-26.1%	368	411	11.7%
New BS majors	283	213	6.6%	158	152	-3.8%

MASTER'S DEGREE PRODUCTION AND ENROLLMENTS

In 2014-15, 33 distinct academic units reported on a total of 43 master's programs in computing, down from last year's 51 units and 62 programs, respectively. Of the 33, 24 were public and 9 private (Tables M1-M2). They accounted for 27 programs in computer science, two in computer engineering, four in information systems, and five each in information technology and software engineering. The small number of participating academic units, students and programs, especially when considered on a discipline-specific basis, should be taken into account when drawing any conclusions from the data presented here. Furthermore, the low sample of units that provided master's degree data to the survey this year and last (15 units reporting on 21 programs in 2014-15, across all of the disciplines) precludes our drawing broad conclusions across multiple years.

Table M3 shows actual degree production in 2013-2014 and anticipated change in that production for 2014-2015 broken down by institution type. Those institutions responding to this year's survey anticipate an overall 26% increase in the production of master's degrees in 2014-2015 over those granted

TABLE M1. SUMMARY OF ACADEMIC UNITS RESPONDING TO MASTER'S SECTION OF SURVEY

	Overall		Public		Private	
	Count	% of Total	Count	% of Total	Count	% of Total
Yes	33	3.1%	24	5.1%	9	1.5%
No	1,030	96.9%	450	94.9%	580	98.5%
Totals	**1,063**	100%	**474**	100%	**589**	100%

TABLE B9. 2014-2015 BACHELOR'S ENROLLMENTS BY DISCIPLINE AND PROGRAM TYPE

	Majors	New Majors	# Programs Reporting Majors	# Programs Reporting New Majors	Avg. Majors per Program	Avg. New Majors per Program	Avg. % New Majors per Program
CS Overall	13,087	3,665	135	130	96.9	28.2	29.1%
CS Public	8,840	2,289	46	42	192.2	54.5	28.4%
CS Private	4,247	1,376	89	88	47.7	15.6	32.8%
CS Master's	5,995	1,805	34	32	176.3	56.4	32.0%
CS Non-Master's	7,092	1,860	101	98	70.2	19.0	27.0%
CE Overall	592	147	7	7	84.6	21.0	24.8%
CE Public	466	114	4	4	116.5	28.5	24.5%
CE Private	126	33	3	3	42.0	11.0	26.2%
CE Master's	428	107	3	3	142.7	35.7	25.0%
CE Non-Master's	164	40	4	4	41.0	10.0	24.4%
IS Overall	1,236	470	39	37	31.7	12.7	40.1%
IS Public	833	313	13	11	64.1	28.5	44.4%
IS Private	403	157	26	26	15.5	6.0	39.0%
IS Master's	489	257	12	11	40.8	23.4	57.3%
IS Non-Master's	747	213	27	26	27.7	8.2	29.6%
IT Overall	2,192	642	20	19	109.6	33.8	30.8%
IT Public	1,368	389	9	8	152.0	48.6	32.0%
IT Private	824	253	11	11	74.9	23.0	30.7%
IT Master's	947	200	8	7	118.4	28.6	24.1%
IT Non-Master's	1,245	442	12	12	103.8	36.8	35.5%
SE Overall	682	213	12	12	56.8	17.8	31.2%
SE Public	464	121	7	7	66.3	17.3	26.1%
SE Private	218	92	5	5	43.6	18.4	42.2%
SE Master's	564	171	6	6	94.0	28.5	30.3%
SE Non-Master's	118	42	6	6	19.7	7.0	35.6%
NDC Overall	17,789	5,137	213	205	83.5	25.1	30.0%
Taulbee	NA*	25,595	NA**	141	NA**	181.52	NA**

*Note: Taulbee does not report total enrollment for current year
**Note: Taulbee only reports by department, not by program

in 2013-2014 (Table M3). CS programs anticipate a 32.7% increase. In comparison, Taulbee schools reported an anticipated decrease in overall master's production for 2014-15 of 4.1% and a decrease among US CS departments of 5.3%.

TABLE M2. SUMMARY OF PROGRAM OFFERINGS

	Overall			Public		Private	
	N Units	Count	% of Total	Count	% of Total	Count	% of Total
CS	25	27	62.8%	21	72.4%	6	42.9%
CE	2	2	4.7%	2	6.9%	0	0.0%
IS	4	4	9.3%	2	6.9%	2	14.3%
IT	5	5	11.6%	3	10.3%	2	14.3%
SE	5	5	11.6%	1	3.4%	4	28.6%
Totals	**33**	**43**	100%	**29**	100%	**14**	100%

Among the 2013-14 master's degree graduates, 31.3% were female, slightly higher than the 28.7% at Taulbee schools. CS, the discipline with the largest response size, reported 30.6% female graduates, higher than the 22.2% reported by Taulbee CS master's programs. Taulbee's "I" programs reported that 48.4% of their master's degrees went to females compared to 37% of IS and IT master's degrees at NDC programs.

A comparison of ethnicity data between NDC and Taulbee schools (Table M5) show that NDC schools had a higher percentage of Hispanic/Latino US resident graduates (6.8% vs. 2.5%), Black/African-American resident graduates (8.3% vs. 2.4%), Asian (14.1& vs. 7.5%) and White graduates (34.7% vs. 29.1%). There was a much smaller percentage of non-resident graduates at NDC institutions than at Taulbee (31.4% vs. 57.7%). It's useful to note that only 7.1% of total Taulbee master's graduates were marked as residents of unknown ethnicity or students of unknown residency. For NDC, the number

TABLE M3. DEGREE PRODUCTION CHANGE BY DISCIPLINE

	2013-2014				2014-2015				% change
	N Units	N Programs	Actual	Per Program	N Units	N Programs	Projected	Per Program	
NDC Overall	28	37	871	23.5	29	38	1,126	29.6	26.0%
CS	21	22	540	24.5	21	22	715	32.5	32.7%
CE	2	2	25	12.5	2	2	24	12	-4.0%
IS	3	3	73	24.3	3	3	36	12	-23.4%
IT	5	5	135	27	5	5	207	41.4	53.3%
SE	5	5	98	19.6	5	5	144	28.8	46.9%

TABLE M4. MASTER'S DEGREES AWARDED BY GENDER, DISCIPLINE AND PROGRAM TYPE

	Male		Female		Total Known Gender	Gender Unknown	Grand Total	N Units	N Programs
CS Overall	311	69.4%	137	30.6%	448	92	540	21	22
CS Public	198	69.0%	89	31.0%	287	92	379	16	16
CS Private	113	70.2%	48	29.8%	161	0	161	5	6
CS Taulbee	5,813	78.0%	1,641	22.0%	7,454	34	7,488	NA	NA
CE Overall	11	73.3%	4	26.7%	15	10	25	2	2
CE Public	11	73.3%	4	26.7%	15	10	25	2	2
CE Private	0	0%	0	0%	0	0	0	0	0
CE Taulbee	491	75.9%	156	24.1%	647	0	647	NA	NA
IS Overall	45	61.6%	28	38.4%	73	0	73	3	3
IS Public	25	71.4%	10	28.6%	35	0	35	2	2
IS Private	20	52.6%	18	47.4%	38	0	38	1	1
IT Overall	86	63.7%	49	36.3%	135	0	135	5	5
IT Public	63	63.6%	36	36.4%	99	0	99	3	3
IT Private	23	63.9%	13	36.1%	36	0	36	2	2
"I" Taulbee	1,386	51.6%	1,299	48.4%	2,685	1	2,686	NA	NA
SE Overall	75	76.5%	23	23.5%	98	0	98	5	5
SE Public	47	81.0%	11	19.0%	58	0	58	1	1
SE Private	28	70.0%	12	30.0%	40	0	40	4	4
NDC Overall	**528**	**68.7%**	**241**	**31.3%**	**769**	**102**	**871**	**28**	**37**
Taulbee Overall	**7,690**	**71.3%**	**3,096**	**28.7%**	**10,786**	**35**	**10,821**	NA	NA

TABLE M5. MASTER'S DEGREES AWARDED BY ETHNICITY (33 depts)

	US Residents							Others				
	Hispanic/ Latino	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black/ African-American	White	2 or more races, non-Hispanic	Non-Resident	Total Ethnicity, Residency Known	U.S. Residency Race Unknown	Residency Unknown	Total
NDC	45	16	93	1	55	229	14	207	660	72	139	871
	6.8%	2.4%	14.1%	0.2%	8.3%	34.7%	2.1%	31.4%	100.0%	–	–	–
Taulbee	247	8	758	3	245	2,926	72	5,799	10,058	437	326	10,821
	2.5%	0.1%	7.5%	0.0%	2.4%	29.1%	0.7%	57.7%	100.0%	–	–	–

TABLE M6. ACTUAL ENROLLMENT CHANGE FROM PREVIOUS YEAR BY DISCIPLINE

	All Respondents								
	2013-2014				2014-2015				
	N Units	N Programs	Headcount	Mean Enroll	N Units	N Programs	Headcount	Mean Enroll	% Change in Mean per Program
CS	30	33	2,209	73.6	21	22	2,155	102.6	39.4%
CE	3	3	53	17.7	2	2	65	32.5	83.6%
IS	4	5	117	29.3	3	3	128	42.7	45.7%
IT	5	5	292	58.4	5	5	673	134.6	130.5%
SE	8	8	301	37.6	5	5	232	46.4	23.4%
NDC Total	**40**	**54**	**2,972**	**74.3**	**28**	**37**	**3,253**	**116.2**	**56.4%**

	Units Responding Both Years								
	2013-2014				2014-2015				
	N Units	N Programs	Headcount	Mean Enroll	N Units	N Programs	Headcount	Mean Enroll	% Change in Mean per Program
CS	12	12	1,626	135.5	12	12	1,705	142.1	4.9%
CE	1	1	50	50	1	1	40	40	-20.0%
IS	1	1	28	28	1	1	22	22	-21.4%
IT	3	3	234	78	3	3	329	109.7	40.6%
SE	4	4	180	45	4	4	170	42.5	-5.6%
NDC Total	**15**	**23**	**2,121**	**141.4**	**15**	**21**	**2,266**	**151.1**	**6.9%**

is 24.2%, which may again suggest that gathering ethnicity/residency data are a challenge at NDC programs (a similar gap was observed last year).

Overall enrollment at NDC master's programs reporting this year was 3,253, which represents a 56.4% increase from the total enrollment reported by last year's respondents (Table M6). Furthermore, fewer programs reported this year than did last year. Therefore, this increase is most likely due to there being a number of relatively large programs that responded this year but did not respond last year, and a number of relatively small programs that responded last year but did not respond this year. Table M6 shows that, when only those programs that responded both years are considered, the overall enrollment increase is 6.9% across all disciplines, with CS programs showing a 4.9% increase.

FACULTY DEMOGRAPHICS

The approximately 140 academic units responding to the faculty section of this year's survey have an average of 10.2 faculty members, comprising an average of 8.1 FTE (Table F1) with an average head count (HC) of 141. This is similar to our observations last year. The average academic unit has approximately five tenure-track faculty members, and the equivalent of four part-time/adjuncts at 50% FTE. Public universities are more likely to use full-time non-tenure-track faculty than are private universities, but tend to use a smaller proportion of part-time/adjunct faculty than do private universities. Academic units with master's programs tend to use more full-time non-tenure-track faculty members than do units without master's programs, but have proportionally fewer tenure-track faculty members than do units without master's programs.

TABLE F1. ACTUAL FACULTY SIZE 2014-2015

Faculty Type	Overall Avg HC	Overall % of HC Total	Overall Avg FTE	Overall % of FTE Total	Public FTE	Private FTE	UG Only FTE	UG+grad FTE
# respondents	141	–	140	–	50	90	104	35
Tenure-track	4.9	48.10%	4.8	59.90%	62.40%	57.10%	63.90%	56.30%
Visiting	0.1	1.50%	0.2	1.90%	1.30%	2.60%	2.90%	1.00%
FT Non-TT	1	9.60%	1	12.10%	14.90%	8.80%	8.00%	15.70%
PT/Adjunct	4.2	40.80%	2.1	26.10%	21.40%	31.50%	25.20%	27.00%
Total	**10.2**	100%	**8.1**	100%	100%	100%	100%	100%

TABLE F2. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY RANK

Faculty Type	Overall	Overall %	Public	Private	UG Only	UG+grad
# respondents	129	100%	48	81	96	32
Full Professor	2	40.10%	40.30%	39.80%	37.40%	42.80%
Associate Professor	1.7	34.40%	36.50%	31.80%	35.90%	32.80%
Assistant Professor	1.2	24.50%	23.20%	26.10%	25.00%	24.10%
Other	0.1	1.00%	0.00%	2.20%	1.70%	0.30%

TABLE F3. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY GENDER (139 units)

Gender	Full Prof	Assoc Prof	Asst Prof	Other T-T	Total T-T
Total Faculty	280	241	173	3	697
Male	82.10%	71.80%	69.40%	100.00%	75.50%
Female	17.90%	28.20%	30.10%	0.00%	24.40%
Not Reported	0.00%	0.00%	0.60%	0.00%	0.10%
percent female *	17.90%	28.20%	30.20%	0.00%	24.40%

* as a percentage of those for whom gender was reported

TABLE F4. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY ETHNICITY (137 units)

Ethnicity	Full Prof	Assoc Prof	Asst Prof	Other T-T	Total T-T
Total faculty	279	235	169	1	684
Nonresident Alien	0.40%	0.90%	3.00%	0.00%	1.20%
American Indian/Alaska Native	0.00%	0.40%	0.00%	0.00%	0.10%
Asian	20.10%	21.30%	20.10%	0.00%	20.50%
Black or African-American	1.80%	3.00%	5.90%	0.00%	3.20%
Native Hawaiian/Pacific Islander	0.00%	0.90%	0.00%	0.00%	0.30%
White	70.60%	64.30%	61.50%	100.00%	66.20%
Multiracial, not Hispanic/Latino	0.70%	2.10%	2.40%	0.00%	1.60%
Hispanic/Latino, any race	2.90%	1.70%	4.10%	0.00%	2.80%
Resident, race/ethnicity unknown	1.80%	0.90%	0.60%	0.00%	1.20%
Total Residency known	98.20%	95.30%	97.60%	100.00%	97.10%
Residency unknown	1.80%	4.70%	2.40%	0.00%	2.90%
Black+Hisp+NatAm+NatHaw+Multi*	5.50%	8.50%	12.70%	0.00%	8.30%

* as a precentage of those for whome residency is known

The distribution of the tenure-track faculty members across ranks slightly favors the higher ranks, as was expected (Table F2). There is a somewhat greater percentage of senior faculty (associate and full professors) at public universities compared with private universities. Academic units with master's programs tend to have a slightly higher percentage of full professors and a slightly smaller percentage of associate professors than do academic units with only undergraduate programs.

As was the case last year, tenure-track faculty gender diversity is strongest at the assistant professor rank and weakest at the full professor rank (Table F3). This year's reporting academic units have a greater percentage of women at the assistant and associate professor rank than did last year's reporting academic units, but have a smaller percentage of women at the full professor rank. Overall, the 24.4% of the tenure-track faculty members who are women is greater than the 22.5% reported last year.

Ethnic diversity also is strongest at the more junior tenure-track faculty ranks (Table F4). The fraction of White faculty members is greater this year than last year at the associate and assistant professor ranks. Also, this year there is a greater fraction than last year of assistant professors from the collective underrepresented minority categories (Black + Hispanic + Native American + Native Hawaiian + Multiracial). In contrast, there is a smaller fraction of Asian associate professors and a smaller fraction of Non-resident Alien assistant professors this year. Also, the academic units who responded this year reported a smaller percentage of tenure-track faculty members whose residency is unknown.

Recruiting of tenure-track faculty members was higher during the past year than during the previous year, but recruiting of other types of faculty was lower. This year's reported hiring success rate for tenure-track faculty members (the percentage of openings that were filled) of 90.9% is much greater than last year's 80% (Table F5). Gender diversity among newly hired tenure-track faculty is stronger this year than last year (33.9% female vs. 22.9% last year), while ethnic diversity is comparable to last year except that this year there was a greater proportion of resident Asians and correspondingly smaller proportion of Nonresident Aliens hired as compared with last year (Table F6).

TABLE F5. FACULTY RECRUITING DURING 2013-2014
(112 RESPONDENTS)

Faculty Type	Number Sought	Avg/Dept	Number Filled	Success Rate
Tenure-track	66	0.61	60	90.90%
Full Professor	–	–	7	–
Associate Professor	–	–	10	–
Assistant Professor	–	–	44	–
Other	–	–	1	–
Visiting	10	0.09	12	120.00%
FT Non-TT	24	0.22	24	100.00%
PT/Adjunct	135	1.25	130	96.30%

TABLE F6. GENDER AND ETHNICITY OF NEWLY HIRED FACULTY
(109 units)

Gender	Ten-Track	% of Total
Male	39	66.10%
Female	20	33.90%
Unknown	0	0.00%
Ethnicity	**Ten-Track**	**% of Total**
Nonresident Alien	1	1.70%
American Indian/Alaska Native	0	0.00%
Asian	17	28.80%
Black or African-American	3	5.10%
Native Hawaiian/Pacific Islander	0	0.00%
White	33	55.90%
Multiracial, not Hispanic/Latino	1	1.70%
Hispanic/Latino, any race	1	1.70%
Resident, race/ethnicity unknown	0	0.00%
Total Residency known	56	94.90%
Residency unknown	3	5.10%
Black+Hisp_NatAm+NatHaw+Multi**	5	8.90%

Doctoral degrees are required by more than 90% of the responding academic units in order to hire tenure-track faculty at senior rank, and for promotion to full professor (Table F7). The doctorate is required by more than ¾ of the units in order to hire at the assistant professor level, and by more than 85% for tenure or promotion to associate professor. However, the master's degree is the predominant requirement in order to hire full-time non-tenure-track faculty. For the hiring of assistant professors and for granting tenure, public universities are more likely to require the doctorate than are private universities. Academic units with graduate programs are more likely to require the doctorate for the hiring and promotion of tenure-track faculty than are academic units with only undergraduate programs. These observations mirror those reported last year.

Many more departures were reported this year than were reported last year. The dominant reasons for departures were retirement and leaving for another academic position (Table F8). This is similar to what is reported in the Taulbee Survey for doctoral granting academic units. Last year, the NDC respondents reported a greater percentage of departures for non-academic positions than for other academic positions. That was not the case this year.

FACULTY SALARIES

This year, a smaller fraction of our respondents provided data about individual faculty salaries. More of the reporting academic units provided only aggregate salary data (i.e., median salaries within their academic unit at each rank).

Table F9 shows the median faculty salaries by rank for those units that provided individual salary data. The entries in Table F9 are true medians of the collective individual salaries at the 42 academic units that provided individual salary data. At these units, there is little difference among public and private universities in full professor salaries, while private universities have higher salaries for associate professors and lower salaries for assistant professors than do public universities. At all ranks, academic units having graduate programs have higher salaries than do academic units that only have undergraduate programs. Overall median salaries for full professors are 9% higher than those reported last year, while overall median salaries for assistant and associate professors are 4% lower than reported last year. However, with the much smaller number of individuals for whom individual salary data were reported this year, these salary results should be treated with an appropriate grain of salt.

Table F10 provides aggregated results for all 92 academic units that provided salary data. The entries in Table F10 are the averages of the median salaries among the academic units that reported salary data at that rank. This includes the academic units that reported individual salaries, as we are able to compute the median salary at each rank for each such academic unit. The entries in Table F10 are not true medians of all faculty salaries nor true averages of all faculty salaries, and are more sensitive to a very high or very low salary in a department with a small number of faculty at a given rank. The aggregated averages of these medians are higher at each rank at public universities compared with private universities. As was the case for the individual salaries, academic units with graduate programs have higher averages at each rank than do academic units having only undergraduate programs.

TABLE F7. DEGREE REQUIRED FOR FACULTY PERSONNEL DECISIONS

Required degree	Hiring Full Prof	Hiring Assoc Prof	Hiring Asst Prof	Hiring FT Non-TT	Tenure	Promotion to Full Prof	Promotion to Assoc Prof
Overall (125)							
Doctoral	95.00%	91.60%	78.90%	17.20%	85.70%	93.40%	85.20%
Masters	5.00%	8.40%	21.10%	80.30%	14.30%	6.60%	14.80%
Bachelors	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%	0.00%
Public (44)							
Doctoral	97.50%	95.00%	93.00%	11.60%	92.70%	92.70%	87.80%
Masters	2.50%	5.00%	7.00%	86.00%	7.30%	7.30%	12.20%
Bachelors	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	0.00%
Private (81)							
Doctoral	93.70%	89.90%	71.30%	20.30%	82.10%	93.80%	84.00%
Masters	6.30%	10.10%	28.70%	77.20%	17.90%	6.20%	16.00%
Bachelors	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%	0.00%
UG only (94)							
Doctoral	93.30%	89.90%	73.10%	17.60%	81.10%	91.30%	82.60%
Masters	6.70%	10.10%	26.90%	79.10%	18.90%	8.70%	17.40%
Bachelors	0.00%	0.00%	0.00%	3.30%	0.00%	0.00%	0.00%
UG and Master's (30)							
Doctoral	100.00%	96.60%	96.60%	16.70%	100.00%	100.00%	93.10%
Masters	0.00%	3.40%	3.40%	83.30%	0.00%	0.00%	6.90%
Bachelors	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

TABLE F8. TENURE-TRACK FACULTY DEPARTURES (88 respondents)

	NDC
Responding units with departures	34
Total number of departures	67
Reason for Departure (percent)	
Retired	47.80%
Deceased	4.50%
Other ac position	23.90%
Non-ac position	6.00%
Changed to PT	6.00%
Other reason	10.40%
Reason unknown	1.50%

CONCLUSION

The data gathered in this year's NDC reflect continued positive trends in enrollment and degree production that extend beyond Taulbee institutions to the hundreds of schools surveyed by ACM-NDC. In addition to valuable pipeline data, NDC also gives the computing education community a previously unavailable snapshot of the students and faculty at these institutions, which annually produce thousands of graduates in the computing disciplines.

If your program participated in the 2014-2015 ACM-NDC study, thank you for your help. The 2015-2016 survey will go out to qualifying programs in the fall of 2015 (look for announcements coming early in the fall). We would love to hear from you about how the survey can be improved, and look forward to your continued, annual participation. If you are at a qualifying program but were not able to participate, or were never contacted, we want to hear from you as well. Please send all comments and queries to Yan Timanovsky, ACM Education Manager at yan.timanovsky@acm.org **Ir**

List of All 224 ACM-NDC Participating Institutions

Alabama State University Department of Computer Information Systems, Alabama State University Department of Mathematics & Computer Science, Albion College, Albright College, American University Department of Computer Science, Angelo State University Department of Computer Science, Augsburg College, Austin Peay State University, Baldwin-Wallace College, Baylor University, Belmont University, Benedictine College, Benedictine University Department of Computer Science & Information Systems, Bennington College Computer Science Program, Berea College, Bethel University Department of Math & Computer Science, Blackburn College (IL), Bloomsburg University of Pennsylvania, Bowdoin College, Briar Cliff University, Bryn Mawr College, Butler University Department of Computer Science and Software Engineering, Cabrini College, California State University Fullerton Department of Computer Science, Calvin College

TABLE F9. MEDIAN FACULTY SALARIES (FROM INDIVIDUAL SALARY DATA)

	Overall	Public	Private	UG only	UG+Grad
Units responding	42	19	23	29	13
Full Professor					
Number of individual faculty	80	45	35	32	48
Median Salary	104,316	104,272	104,360	92,805.50	111,035.50
Associate Professor					
Number of individual faculty	87	53	34	45	42
Median Salary	83,900	82,835	90,458.50	79,450	98,852.50
Assistant Professor					
Number of individual faculty	57	40	17	29	28
Median Salary	70,700	71,350	60,000	61,754	81,049
Other					
Number of individual faculty	53	44	9	14	39
Median Salary	63,000	63,000	64,070	54,249.50	65,000

TABLE F10. FACULTY SALARIES (FROM AGGREGATE SALARY DATA)

	Overall	Public	Private	UG only	UG+Grad
Units responding	**92**	**40**	**52**	**65**	**27**
Full Professor					
Departments responding	72	37	35	46	26
Average of Median Salary	94,322	102,687	86,177	87,303	107,551
Associate Professor					
Departments responding	68	34	34	44	24
Average of Median Salary	78,624	85,832	72,339	75,136	85,320
Assistant Professor					
Departments responding	62	34	28	38	24
Average of Median Salary	66,890	71,167	62,061	59,502	79,818
Other					
Departments responding	39	25	14	20	19
Average of Median Salary	53,200	60,064	43,667	46,463	61,710

Department of Computer Science, Canisius College Computer Science Department, Capital University, Central College, Central Connecticut State University Department Of Computer Science, Centre College, Chestnut Hill College, City University of Seattle Technology Institute, Coker College, California State University Long Beach College of Engineering, College of New Jersey Computer Science Department, College of Saint Benedict and Saint John's University (MN), College of the Holy Cross, Columbia College (MO), Covenant College, Creighton University, CUNY John Jay College of Criminal Justice, Davis & Elkins College, Delaware State University Department of Computer & Information Sciences, Denison University, DePauw University, DeSales University, Dickinson College, Dillard University, Doane College, Dominican University Computer Science Department, Dowling College Department of Mathematics and Computer Science, Drake University Information Systems Program, Eastern Oregon University, Eureka College, Fairleigh Dickinson University-Florham Campus, Florida Memorial University, Fontbonne University, Franklin W. Olin College of Engineering, Friends University, George Fox University Department of Computer Science and Information Systems, Georgia College & State University, Georgia Southern University Department of Computer Sciences, Georgian Court University, Gettysburg College, Gordon College, Graceland University-Lamoni, Grambling State University Department of Computer Science, Grand View University, Grinnell College, Gustavus Adolphus College, Hamilton College, Harvey Mudd College, Hendrix College, Hiram College, Hofstra University School of Engineering and Applied Science, Houghton College, Howard Payne University (TX), Idaho State University, Indiana State University Math and Computer Science Department, Indiana University of Pennsylvania, Indiana University-Purdue University Indianapolis Dept of Computer Info and Leadership Technology,

Indiana University-Purdue University-Fort Wayne Department of Computer Science, Jacksonville University, Juniata College, Kalamazoo College, Kean University, King's College Department of Mathematics and Computer Science (PA), Lake Superior State University Computer Engineering Program, Lawrence University, Le Moyne College, Lewis-Clark State College, Livingstone College, Longwood University, Loyola University Maryland Department of Information Systems/Operations Management, Loyola University-Chicago Department of Computer Science, Mars Hill College, Maryville College, Marywood University, Methodist University (NC), Metropolitan State University (MN), Millersville University of Pennsylvania, Milligan College, Minnesota State University, Mankato Department of Information Systems and Technology, Missouri State University Department of Computer Science, Montana Tech of the University of Montana Department of Computer Science, Morehead State University Department of Mathematics, Computer Science, and Physics, Morrisville State College, Mount Holyoke College, Nebraska Wesleyan University, New College of Florida Computer Science Program, Northeastern Illinois University, Northern Kentucky University, Northern Michigan University Mathematics and Computer Science Department, Northern New Mexico College, Oberlin College, Oglala Lakota College, Ohio Wesleyan University, Olivet Nazarene University, Otterbein University, Ouachita Baptist University, Pacific Union College, Park University, Philander Smith College, Pomona College, Quinnipiac University Computer Information Systems, Ramapo College of New Jersey, Regis University College of Computer & Information Sciences, Roberts Wesleyan College, Rocky Mountain College, Roger Williams University, Rollins College, Roosevelt University, Rose-Hulman Institute of Technology Department of Computer Science and Software Engineering, Seattle University, Shippensburg University of Pennsylvania, Siena College, Simpson College, Smith College, Southeast Missouri State University, Southern Adventist University, Southern Connecticut State University, Southern Polytechnic State University Information Technology Department, Southwestern University, St. Cloud State University Department of Information Systems, St. Olaf College, State University of New York at Brockport, SUNY at Fredonia, SUNY College at Oswego, Tennessee Wesleyan College, Texas A&M University - Corpus Christi, The College of St. Scholastica, The College of Wooster, The State University of New Jersey Computer Science Department, Trinity University, Union College (NY) Computer Science Department, Univ. of Missouri-St. Louis Department of Mathematics and Computer Science, University of Alaska Anchorage Computer Systems Engineering Program, University of Central Missouri Department of Mathematics and Computer Science, University of Central Oklahoma, University of Evansville, University of Hartford Electrical and Computer Engineering Department, University of Louisiana at Monroe Department of Computer Science, University of Maine at Farmington, University of Minnesota Duluth Department of Computer Science, University of Minnesota-Morris, University of Mount Union, University of North Carolina at Greensboro, University of North Carolina Wilmington Department of Computer Science, University of Portland, University of Puerto Rico Rio Piedras Campus, University of Tennessee-Martin, University of Texas at Brownsville & Texas Southmost College, University of Washington Tacoma, University of Wisconsin-Green Bay, University of Wisconsin-Parkside, University of Wisconsin-Platteville, University of Wisconsin-Stout Department of Mathematics, Statistics and Computer Science, Valparaiso University Department of Mathematics & Computer Science, Villanova University Department of Computing Sciences, Walla Walla University Department of Computer Science, Wartburg College, Weber State University Computer Science Department, West Virginia State University, West Virginia University Institute of Technology Dept of Computer Science and Information Systems, West Virginia Wesleyan College, Western Carolina University, Western Kentucky University Department of Computer Science, Western New England University, Western Oregon University, Western State College of Colorado, Western Washington University, Westminster College (PA), Westminster College (UT), William Penn University, Williams Baptist College, Xavier University (OH).

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