COMPUTER SCIENCE & ENGINEERING

Climate, Diversity, Equity, and Inclusion

AY 2023-2024 Annual Report

Contents

Highlights and New in 23-24

Recruitment

- New pathways into CSE with focus on transfer students from community colleges in Michigan and students from pre- first-year summer transition programs.
- Increased yield for Rackham Merit Fellowships (RMF) through Graduate Admissions committee process improvement.
- Introduced Rackham Diversity Statement Evaluation Rubric into the Tenure-track Faculty Search evaluation process.

Support and Retention

- Continued partnerships between core CS courses and Foundational Course Initiative (FCI) with Focus on Equitable Teaching Practices (EECS 280).
- New EECS course focusing on transfer students support and retention starting Fall 2024.
- Increased individual and group Graduate Student coaching support.
- Increased professional development opportunities and DEI training for staff.

Climate

- New training initiatives for undergraduate Instructor Aides.

For a list of select DEI programs and initiatives, see Table of DEI Programs and Initiatives.

Introduction

This report is a public record of statistics and activities intended to provide transparency regarding climate, diversity, equity, and inclusion in Computer Science and Engineering at the University of Michigan. The report is suitable for students and community members, and includes brief contextual information and background for nuanced topics.

Continuing our renewed commitment to transparency, we make this report, and subsequent annual reports, public. Other reports are available.

Diversity, equity, and inclusion are core values of the University, the College of Engineering, and Computer Science and Engineering. There are legal (e.g., equal opportunity and treatment), moral (e.g., ideology), and pragmatic (e.g., engineering is a creative activity that benefits from multiple perspectives) reasons, among others, to broaden participation in computing. One goal of this report is to help track progress and identify areas for improvement.

Issues and Terminology

Because this is a public-facing document intended for a general audience, we provide a brief introduction to some of the issues and terms.

Diversity, Equity, and Inclusion (**DEI**) concerns are multifaceted. While notions such as race, ethnicity, and gender are commonly considered, DEI includes all students and community members.

Underrepresented minority racial and/or ethnic backgrounds (**URM**) are context-dependent with respect to computer science in particular and engineering in general. For example, while Asian and Asian-American individuals are a minority group in the United States generally, they are not an underrepresented minority in computing. The Rackham Graduate School URM definition includes African Americans, Hispanic Americans, American Indians/Native Alaskans, Native Hawaiians/Pacific Islanders (excluding Asian Americans), and multiracial students identifying with at least one of the previously listed URM categories. The term “underrepresented minority” may be seen as problematic because it defines disparate groups with a homogeneous term, which those groups did not choose (see the Tiffani Williams essay at the CACM website). We use the term because it is the current language of the Rackham Graduate School and the University.

Note that Rackham Graduate School also highlights the following groups as part of their DEI strategic plan: students from underrepresented racial and ethnic groups; students who are underrepresented by gender in their field; students with disabilities; students from socially, culturally, economically, or educationally disadvantaged backgrounds; lesbian, gay, bisexual, and transgender students; undocumented and DACAmented students; student veterans; non-traditional age students; and students from nationalities around the world.

Statistics often distinguish between **sex** (e.g., males, females, etc.) and **gender** (e.g., men, women, etc.), with the latter viewed through the lens of social construction or identity. The latter can be particularly helpful for discussions of LGBTQ+ issues, among other contexts. The National Center for Women & Information Technology provides an accessible summary of the overall state of gender diversity in computing. Historically, the female share of CS undergraduate degrees reached its peak around 40% in the 1970s, plummeted into the low teens (e.g., 12-15%), and is back up to around 20% in most CS departments. There are outliers, such as Harvey Mudd College and Carnegie Mellon University, where female participation in the undergraduate computer science degree program is around 50%.

When measuring participation, we often consider individuals at various stages of a program or process. Broadly, the group of people applying for a position or status (e.g., applying to declare the major, applying to join the graduate program, applying for a faculty position) in a particular year is the **applicant pool**. In the case of faculty hiring, a subset of the applicants will be invited to **interview**. Based on a set of criteria, a subset of applicants will be **admitted** or given an **offer** (e.g., only some who apply to join the graduate program are extended an offer of admission). Of those admitted, a subset will **accept** the offer and join or **enter** the program. Eventually, a subset of those will **complete** the program or otherwise reach a particular milestone (e.g., students may complete the major and obtain the degree, junior faculty may be granted tenure, etc.).

Different measurements at these stages can highlight areas for improvement. For example, when few individuals are present in the applicant pool or when individuals withdraw after an interview or visit, it is typically viewed as a **recruitment** problem. By contrast, if fewer individuals complete the program than begin it, it is typically viewed as a **retention** problem. These distinctions are relevant because they often have different causes or remedies. For example, recruitment issues may be partially addressed through outreach to other schools, while retention issues typically implicate weaknesses in our climate, policies, and support for those already here.

Broadening participation in computing has been an explicit goal of the US National Science Foundation (NSF) for decades. The NSF funded about a dozen alliances to improve our national ability to diversify computing (see the AAAS report on BPC alliances). Former US President Barack Obama made it a national goal to provide “CS for All” in US schools, and the CS for All consortium still continues to work toward that goal. Understanding how computer science became so male-dominated, compounded by the underrepresentation of BIPOC (Black, Indigenous, and People of Color) students, remains an open research question today. One of the best empirical studies is *Unlocking the Clubhouse* by Jane Margolis and Alan Fisher. A historical treatment is *The Computer Boys Take Over* by Nathan Ensmenger.

Michigan Law and Context

Affirmative action broadly refers to policies designed to help disadvantaged or underrepresented groups. In 2006, the Michigan Civil Rights Initiative (**MCRI**) was adopted by Michigan voters; that initiative, which is codified as Article I, Section 26 of the Michigan Constitution, prohibits public universities from “discriminat[ing] against, or grant[ing] preferential treatment to, any person or group on the basis of race, sex, color, ethnicity, or national origin in the operation of public education, public employment, or public contracting.” The long-term effects of the law are still being studied.

One implication, phrased informally, is that programs that provide additional help or resources or guide admissions or hiring decisions *cannot* be based on qualities such as race or gender. Programs that help support student success, such as the M-STEM (Michigan Science, Technology, Engineering and Mathematics) Academies or the Comprehensive Studies Program (CSP), use alternate criteria. For example, CSP’s mission includes a focus to “provide academic guidance for, and retain undergraduate students from diverse populations with outstanding potential for success at the University of Michigan” and any student can apply to join CSP.

While affirmative action remains controversial (with multiple pro and con arguments, and the Michigan Civil Rights Initiative passing by a 58 to 42 margin), the state law does limit targeted actions that can be taken by the University in general and by CSE in particular. Issues regarding the underrepresentation of particular groups cannot legally be addressed through programs limited to individuals of those particular races, ethnicities or genders. Instead, we seek to address underrepresentation by offering programs and initiatives that focus on issues of diversity or that are intended to improve the experiences of underrepresented

groups, but that are open to all without regard to identity. In addition, we recognize that issues of climate, diversity, equity, and inclusion affect us all and that efforts should improve the experiences, and support the success, of all students and community members.

Trends and Comparisons

In many places in this report, we provide high-level direct comparisons to the previous year with the searchable heading "*Changes from previous year.*" CSE's annual transparency reports are published and admit direct, and eventually longer-term, comparisons.

Undergraduate Program

Information about the CSE undergraduates is available at various points throughout the program.

Undergraduate Major Enrollment

The Office of the Registrar's Enrollment Report for Computer Science and Engineering Undergraduates provides enrollment information. We consider the CS Major (Engineering), the CS Major (Literature, Science and Arts), the Data Science Major (Engineering), the Data Science Major (Literature, Science and Arts) (shared with Statistics), and the Computer Engineering Major (shared with Electrical and Computer Engineering):

	Winter 2024		Fall 2023		Winter 2023		Fall 2022		Winter 2022		Fall 2021	
Total	3364	100%	3135	100%	3250	100%	2863	100%	2966	100%	2752	100%
Female	893	26.5%	801	25.6%	824	25.4%	709	24.8%	717	24.2%	651	23.7%
Male	2471	73.5%	2334	74.4%	2426	74.6%	2154	75.2%	2249	75.8%	2101	76.3%
Asian	1121	33.3%	1009	32.2%	1017	31.3%	883	30.8%	859	29%	778	28.3%
Black	59	1.8%	49	1.6%	40	1.2%	38	1.3%	49	1.7%	44	1.6%
Hispanic	159	4.7%	143	4.6%	144	4.4%	115	4.0%	142	4.8%	137	5%
Two or More	95	2.8%	90	2.9%	90	2.8%	81	2.8%	87	2.9%	79	2.9%
Two or More URM	32	1.0%	32	1.0%	38	1.2%	36	1.3%	44	1.5%	39	1.4%
Unknown	219	6.5%	215	6.9%	233	7.2%	202	7.1%	202	6.8%	185	6.7%
White	999	29.7%	937	29.9%	1014	31.2%	889	31.1%	976	32.9%	931	33.8%
Non Resident Alien	676	20.1%	656	20.9%	670	20.6%	616	21.5%	605	20.4%	557	20.2%

To provide a context for these numbers on race, the state of Michigan is 74.0% White, 14.1% Black, 5.7% Hispanic, and 3.5% Asian, according to the US Census.

In the past, CSE did not directly admit first-year undergraduates when they entered the University of Michigan. Instead, undergraduates completed a number of semesters of prerequisite courses as undeclared students (e.g., in Engineering or

Literature, Science and Arts) before applying to declare a computing major. As of Fall 2023, the majority of students entering the major are admitted as first-year students.

Engineering and LSA showed similar patterns of enrollment with respect to ethnicity. In Winter 2024, Engineering undergraduates in Computer Science were 7.7% URM (see Issues and Terminology above for the definition of Underrepresented Minority), and LSA undergraduates in Computer Science were 6.7% URM. On the other hand, we noted different patterns of enrollment between Engineering and LSA undergraduates with respect to gender. For example, in Winter 2024, 24.1% of Engineering undergraduates in Computer Science were female, while 29.3% of LSA undergraduates in Computer Science were female. These enrollment patterns are in line with enrollment patterns for AY 22-23.

Changes from previous years: As with previous years, total undergraduate enrollment has continued to increase. Similarly, enrollment of female students has increased (both proportionately and in absolute amounts) every year. The population of Black and Hispanic students increased slightly (both proportionally and in absolute amounts) in the past year. The CSE Enrollment and Admissions Team (EAT) has identified new admissions pathways, including considerations for increasing the diversity of our undergraduate population. Pathway one, focusing on preferred admissions for incoming high school students, was implemented this year, beginning with students who enrolled in Fall 2023. Refer to the Strategic Plan section for more information.

Undergraduate Core Courses

Computing CARES conducts extensive surveys and interventions in courses associated with the first through third semester of the CSE program. In this presentation, Likert scale responses are presented as 1-5 numerical values (e.g., terms such as “strongly disagree,” “poor,” or “not at all” map to 1; “neutral” maps to 3; “strongly agree” or “excellent” map to 5, etc.).

EECS 183, ENGR 101, and ENGR 151 are introductory computing courses. We present *start-of-course* survey data for 1721 EECS 183, 756 ENGR 101 and 117 ENGR 151 consenting AY 2023 students. Note that some students use transfer credit or a proficiency exam instead of taking introductory courses at U-M.

EECS 376 is an undergraduate theory of computation course. It is required for the major and is often one of the last non- elective courses taken. We present *end-of-course* survey data for 558 consenting Fall 2022 students and 543 Winter 2023 students.

Select sentiment and climate questions:

	Start of EECS 183, ENGR 101, ENGR 151				End of EECS 376			
	AY 2023	AY 2022	AY 2021	AY 2020	AY 2023	AY 2022	AY 2021	AY 2020
After graduation, there are equal opportunities for a career in Computer Science for males and females alike	3.51	3.55	3.56	3.50	3.58	3.60	3.48	3.48
I find Computer Science intimidating.	3.48	3.44	3.38	3.40	3.28	3.23	3.26	3.14
I can see myself in a computing-related career in the future.	3.62	3.63	3.55	3.64	4.17	4.25	4.27	4.28
I believe that other students in Computer Science will be welcoming of me.	3.73	3.79	3.82	3.80	3.83	3.85	3.85	3.92
I feel included in the groups that I want to belong to.	3.67	3.70	3.73	3.78	3.82	3.80	3.79	3.90

How would you describe your current mental health?	3.05	3.09	3.06	3.29	2.90	2.88	2.70	2.89

Changes from previous year. Computing Cares has not completed analysis on data collected in AY24. AY23 data has been preserved for this section.

	Start of EECS 183, ENGR 101, ENGR 151				End of EECS 376			
	AY 2023	AY 2022	AY 2021	AY 2020	AY 2023	AY 2022	AY 2021	AY 2020
Man	53.76%	57.49%	59.76%	61.62%	68.02%	71.19%	67.89%	75.50%
Woman	44.08%	40.6%	39.45%	37.58%	29.07%	27.15%	31.41%	24.06%
Nonbinary	1.73%	1.6%	0.53%	0.54%	2.56%	1.66%	0.42%	0.00%
Trans	0.43%	0.32%	0.26%	0.27%	0.35%	0.00%	0.28%	0.44%
Asian	37.59%	37.65%	36.86%	36.62%	57.6%	57.62%	55.08%	52.85%
Black	2.77%	2.63%	2.79%	2.70%	1.18%	0.84%	1.43%	0.44%
Hawaiian or Pacific Islander	0.00%	0.08%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%
Hispanic or Latino	4.91%	3.25%	3.05%	3.66%	2.47%	1.96%	1.72%	1.97%
Native American or Alaska Native	0.04%	0.16%	0.00%	0.08%	0.12%	0.42%	0.14%	0.00%
Two or More	3.64%	3.88%	3.32%	3.12%	3.06%	3.92%	3.29%	2.63%
Two or More URM	7.28%	5.65%	3.76%	4.63%	2.83%	3.36%	2.43%	2.19%
White, Caucasian, Middle Eastern, North African, Arab	43.77%	46.71%	50.22%	49.15%	32.74%	31.89%	35.91%	39.91%

Changes from previous year. We continue to see an increased enrollment of women at the beginning of the curriculum. We also see an increase from last year in the percentage of women, nonbinary, and trans students persisting through EECS 376. However, if one assumes, for simplicity, that first-years from AY21 are now completing EECS 376 in AY23, there is a 27.75% decrease in women for this group (i.e., 1 in 3 women left by EECS 376). While we see an increase in Black students at the beginning of the program and in EECS 376, there remains a large decrease in Black student enrollment in EECS 376 compared to the beginning of the program. Similarly, we see continued enrollment increases of Hispanic or Latino students, but the percentage of Hispanic or Latino students persisting through EECS 376 continues to be much lower than at the start of the program (with both populations, we encourage caution in the interpretation of changes to smaller numbers).

Undergraduate Degree Conferral

The Office of Student Affairs (Lisa Villarreal, 6/6/2024) provides the following information about selected undergraduate degree conferral rates. We consider the CS Major (Engineering), the CS Major (Literature, Science and Arts), the CS Minor, the Data Science Major (Engineering), the Data Science Major (Literature, Science and Arts) (shared with Statistics), and the Computer Engineering Major (shared with Electrical and Computer Engineering).

	2023-24		2022-23		2021-22		2020-21	
Total	1722	100%	1629	100%	1548	100%	1285	100%
CS Eng Total	642	37.28%	603	35.64%	598	38.63%	538	41.87%
CS LSA Total	577	33.51%	596	35.22%	460	29.72%	404	31.44%
CS Minor Total	243	14.11%	248	14.66%	211	13.63%	182	14.16%
CE Total	114	6.62%	104	6.15%	116	7.49%	110	8.56%
DS Eng Total	33	1.92%	39	2.30%	54	3.49%	51	3.97%
DS LSA Total	113	6.56%	102	6.03%	109	7.04%	92	6.65%
CS Eng Female	131	20.40%	134	22.22%	109	18.23%	96	17.84%
CS LSA Female	171	29.64%	182	30.54%	129	28.04%	130	32.18%
CS Minor Female	90	37.04%	69	27.82%	70	33.18%	48	26.37%
CE Female	21	18.42%	19	18.27%	23	19.83%	21	19.09%
DS Eng Female	6	18.18%	11	28.21%	13	24.07%	8	15.69%
DS LSA Female	38	33.63%	35	34.31%	44	40.37%	26	28.26%
CS Eng URM	41	6.39%	40	6.63%	47	7.86%	36	6.69%
CS LSA URM	23	3.99%	34	5.70%	36	7.83%	26	6.44%
CS Minor URM	14	5.76%	17	6.85%	24	11.37%	13	7.14%
CE URM	7	6.14%	10	9.62%	12	10.34%	8	7.27%
DS Eng URM	5	15.15%	2	5.13%	5	9.26%	1	1.96%
DS LSA URM	2	1.77%	4	3.92%	4	3.67%	2	2.17%

Changes from previous year. There is a decrease in major degree conferral rates across all majors for female students, except CE which remained steady. Additionally, there is a decrease in URM degree conferral rates across all majors and the minor, except DS Eng. Total degree conferral (e.g., for graduating seniors) rose from last year alongside total enrollment (including students early in the program).

The Michigan Engineering Career Resource Center provides salary data on average salaries by major. For 2023, the latest report available as of this writing, the reported annual Computer Science salaries for students graduating with bachelor's degrees were median $119,500, average $116,477, and range $40,000–$250,000. The Engineering Career Resource Center does not tie their data to ethnicity breakdowns.

Undergraduate Program Context and Discussion

As a broad point of comparison, the 2023 Computing Research Association Taulbee Survey of 182 PhD-conferring CS departments documents the continued increase of CS enrollment and degree conferral at all levels. Gender diversity amongst undergraduate degree conferrals stayed relatively the same from the 2022 report to the 2023 report; amongst CS graduates for whom the information was known in 2022-2023, 22.5% were female in comparison to 22.2% in 2021-2022. Similarly, enrollment of females in CS stayed about the same at 23.1% in 2022-2023 in comparison to 22.5% in 2021- 2022.

In comparison to the previous year, the 2023 Taulbee survey found a slight increase in Black or African American enrolled in CS. 5.5% of undergraduates reported identifying as Black or African American (as opposed to 4.6%). Percentages for Hispanic students enrolled in CS stayed relatively the same. 10.7% of undergraduates reported identifying as Hispanic (as opposed to 11.1%).

CSE's undergraduate enrollment of female students (26.5%) continues to exceed the national average represented by the Taulbee Survey. The survey also found that 22.5% of CS Bachelor's degrees and 18.5% of CE Bachelor's degrees were awarded to female students. CSE's CS Bachelor's degree conferral rate (combining CS Eng and CS LSA) for females, 25.02%, continues to exceed the national average and CE Bachelor's Degree conferral rate is equal to the national average.

CSE's undergraduate enrollment of Black students continues to fall significantly below the Taulbee survey percentages and percentages of the population in the state. CSE Hispanic undergraduate enrollment increased slightly over the past year (although rates stayed about equal) and continues to fall below both the percentage of the population in the state and the national average. Taken together, the degree conferral rate for all URM student majors this year is 5.27%, which is a decrease from last year (6.32%) and is below the national average. The degree conferral rate for all URM student majors also falls below the admission rates for all URM student majors (7.43%). When enrollment or admission rates for a group are lower than degree conferral rates for that group, it highlights a pipeline or retention issue.

Graduate Program

Information about the CSE graduate program is available at various points throughout the report. Note that because the graduate program is associated with the Rackham Graduate School, some data reporting follows a different format.

Note that race/ethnicity information (e.g., such as being Black, Hispanic, or Native American) is typically only associated with domestic students and is usually not tracked for international students.

Graduate Admissions Process

Broadly, students apply to CSE's graduate program seeking a master's degree or a Doctor of Philosophy (PhD). **Master's** students are typically self-funded and pursue a two-year degree based on coursework. (Some master's students are more research-focused and may transition to the PhD program after completing the master's degree.) Our Sequential Undergraduate/Graduate Study (**SUGS**) program allows Michigan students to complete an undergraduate degree and master's degree, often in a total of five years. While **PhD** completion times vary, it is common for a student to spend four years on doctoral research after completing a master's degree. Some students apply for the PhD program after completing a master's degree elsewhere; others may apply after a bachelor's degree and then obtain a master's degree and PhD sequentially.

While graduate degrees share many similarities, because the master's degree typically places more of an emphasis on coursework and the PhD degree typically places more of an emphasis on research, graduate admissions often treat applicants separately. While strong graduate applicants are distinguished by initiative and a mastery of undergraduate material generally, strong PhD applicants typically additionally demonstrate experience with independent research.

All CSE faculty members can review all CSE graduate applicants. The **graduate admissions committee** reviews all applicants, regardless of focus area, and brings strong applicants to the attention of appropriate faculty. This involves a holistic consideration of individual application materials, including direct applicant mentions of particular faculty members as well as perceived research interest or overlap based on application essays and previous experience.

Faculty often follow up with admitted students to encourage them to **accept** the offer. This is often done through a combination of email, phone calls, and awarding scholarships or fellowships, such as the Rackham Merit Fellowship. In addition, CSE hosts a formal Visit Day. In general, it can be more difficult for some students to attend a Visit Day (e.g., based on international or socioeconomic status). CSE provides full support for domestic students and $500 for international students for Visit Day travel.

In 2023-24, CSE sponsored 21 students for graduate **fellowships**: each student had at least one CSE faculty recommender. The fellowships included the Michigan Rackham Merit Fellowship (RMF), among many others. Regarding RMF, 16 nominations were submitted for CSE RMF. Ten were selected by CSE for RMF nomination with a first-year department fellowship back-up (5 in Round 1, 5 in Round 2), 6 were awarded by Rackham, and 2 have matriculated.

Changes from previous year. Compared with the previous year, CSE sponsored more students for fellowships compared to the previous year (21 vs. 16). A more detailed breakdown of the departmental fellowship data is provided below.

	Department Fellowships Fellowship (including IMF)	Department + GRSA Combo
International	**14**	**13**
Female	3	2
Male	11	11
Domestic	**7**	**2**
Female	3	0
Male	4	2
White	5	1
Asian	4	1
Total	**21**	**15**

Graduate Recruiting

CSE does not currently have a program of faculty or staff visits to other schools for recruiting purposes. In recent years, current PhD students have returned to their alma maters to deliver recruitment talks. In addition, CSE makes heavy use of advertising through social media and mailing lists, including lists targeted at specific audiences, such as URM students.

In the 2023-2024 Academic Year, in conjunction with CSE Explore Grad Studies, we sent targeted recruitment emails to over 180 faculty at 89 institutions, including:

- Amherst College, Arizona State University, Boston University, Brown, Cal Tech, Carleton College, Case Western, CMU, Columbia University, Cornell, Dartmouth, Dearborn, Duke, Florida State University, Georgia State University, Georgia Tech, Harvard University, Harvey Mudd College, Howard University, Johns Hopkins, Miami University, Michigan State, Michigan Tech, University of Minnesota, MIT, North Carolina, North Carolina A&T State University, North Eastern, Northeastern, Northwestern, NYU, Ohio State, Penn State, Princeton, Purdue, Rice, Rutgers, Southeastern Oklahoma State University, Southern Methodist University, Stanford, Stevens Institute of Technology, Stonybrook, Swarthmore College, Syracuse University, Texas A&M, Tufts University, UC Berkeley, UC Irvine, UC Santa Cruz, UCLA, UCSD, UIC, UIUC, UMass Amherst, UNC, University of Chicago, University of Alaska Fairbanks, University of Arizona, University of Colorado Boulder, University of Hawaii at Manoa, University of Maryland, University of Michigan-Flint, University of Notre Dame, University of Toronto, University of Utah, University of Virginia, University of Washington, University of Waterloo, University of Wisconsin-Madison, UPenn, USC, UT Austin, UT Dallas, UT El Paso, Virginia Tech, Washington University in St. Louis, Wayne State, Wellesley College, Western Michigan University, Williams College, and Yale.

In addition, CSE sends broader recruitment materials to over 300 mailing lists associated with multiple universities and organizations, including student organizations focused on underrepresented groups.

Similar to prior years, CSE sent recruiting emails to UM student organizations (including ColorCoded, VoiCSEs, HKN, SHPE, GoSTEM, SWE, GradSWE, ETC, GEECS, KTP, over 170 National Society of Black Engineers students, and over 110 previous participants in the Explore Grad Studies program.

A total of 66 participants attended the virtual CSE Explore Grad Studies 2023 Workshop, which helps prepare students for graduate applications. A more detailed breakdown of the registrations and participants is provided below.

	Registrations	Participants
Total	**203**	**66**
Gender		
Woman	64	14
Man	133	49
Gender nonbinary	1	0
Did not disclose	6	3
Citizenship		
US Citizen/Perm. Res./DACA	110	29
American Indian or Alaska Native	1	0
Asian	42	8
Black	4	1
Hispanic	3	2
White	44	13
Two or more	9	3
Did not disclose	7	2
Non-resident	94	37

Graduate Applications: Race/Ethnicity Statistics By Degree

In AY 2023, CSE tracked 1301 applicants to the Ph.D. program (via the Graduate Admissions dashboard system). Of those applicants, 128 were given offers of admission and 53 accepted. Their self-reported races/ ethnicities were:

	Applied (PhD)		Admitted (PhD)		Accepted (PhD)	
	2023	2024	2023	2024	2023	2024
Total	1300	1687	128	169	52	78
2 or More	10	18	4	6	3	3
Asian	127	128	18	16	4	4
Black	7	15	1	2	0	0
Hispanic	12	22	4	4	1	2
Native American	0	0	0	0	0	0
Did Not Indicate	24	34	1	6	0	1
Non-Domestic	1000	1309	78	100	34	54
White	123	181	22	30	9	13

Changes from previous year. Overall, PhD applications increased by about 30% over the previous year. There was an

increase in multiracial and Asian applicants, and a significant increase in applicants who identify as Black. CSE extended significantly more offers of admissions, and we note that admissions are guided by faculty advisor availability and research funding.

In AY 2023-24, CSE tracked 2716 applicants to the MS program. Of those, 138 were given offers of admission and 42 accepted. Their self-reported ethnicities were:

	Applied (MS)		Admitted (MS)		Accepted (MS)	
	2023	2024	2023	2024	2023	2024
Total	2463	2716	175	138	50	42
2 or More	9	20	6	4	0	2
Asian	285	311	67	41	28	11
Black	8	9	0	0	0	0
Hispanic	9	24	5	8	0	0
Native American	1	1	0	0	0	0
Did Not Indicate	15	30	3	5	1	1
Non-Domestic	2140	2204	93	63	23	25
White	95	87	22	31	10	16

Changes from previous year. Master's applications increased by almost 10% over the previous year. We notice a significant increase in the number of applicants who self identify as Hispanic or multiracial, and a slight decrease in the number of white applicants. The Master's program shows a significant decrease (of about 20%) in the number of students admitted.

Graduate Applications: Undergraduate Institution Statistics

In AY 2023-24, CSE received PhD applicants from a number of undergraduate institutions. The undergraduate institutions of applicants are one lens to evaluate the breadth of the applicant pool and our recruitment outreach efforts. Applicants who did not indicate one of the three most frequent ethnicities (i.e., "Did Not Indicate," "White," or "Asian") came from 17 undergraduate institutions:

- Brigham Young University, University of Utah, Carnegie Mellon University, Georgia Tech, Grand Valley State University, MIT, New York University, Stanford University, Temple University, University of Chicago, University of Illinois Springfield, University of Michigan, University of Michigan Flint, University of North Carolina Charlotte, University of Pennsylvania, University of Texas Austin, Virginia Tech, Washington University St Louis.

For Fall 2024, CSE admitted applicants who did not indicate one of the three most frequent ethnicities came from the below 13 institutions. Regarding matriculation, 6 students accepted our offer from Addis Ababa University, Cornell University, Johns Hopkins University, University of California Berkeley, University of Louisiana Lafayette, University of Michigan Dearborn.

- Addis Ababa University, Agnes Scott College, Cornell University, Johns Hopkins University, MIT, Rose-Hulman Institute of Technology, Stanford University, University of California Berkeley, University of Louisiana Lafayette, University of Michigan Dearborn, University of Michigan, University of Pennsylvania, Wellesley College.

Focusing specifically on Master's students, CSE internal tracking reports that the accepted Master's degree students for Fall 2024 come from 62 different colleges including:

- Amrita Vishwa Vidyapeetham University, Anna University Chennai, Arizona State University, Birla Institute of Technology and Science Pilani, Bowdoin College, California State Polytechnic University Pomona, California State University

Sacramento, Carnegie Mellon University, Colorado College, Cornell University, Dartmouth College, Delhi Technological University, Duke University, Harvard University, Indian Institute of Technology Bombay, Indian Institute of Technology Delhi, Indian Institute of Technology Kharagpur, Indian Institute of Technology Madras, Indian Institute of Technology Roorkee, Indian Institute of Technology Ropar, Indiana University Bloomington, Kettering University, Miami University, New York University, Ohio State University, PES University, Princeton University, Providence College, Rice University, Shanghai Jiao Tong University, Stony Brook University, Tsinghua University, Tufts University, United States Military Academy, University of California Berkeley, University of California Irvine, University of California Los Angeles, University of California San Diego, University of California Santa Barbara, University of Central Florida, University of Chicago, University of Connecticut, University of Detroit Mercy, University of Illinois Urbana-Champaign, University of Maryland College Park, University of Massachusetts Amherst, University of Michigan Dearborn, University of Michigan, University of North Carolina Chapel Hill, University of Rochester, University of Texas Austin, University of Utah, University of Virginia, University of Washington, University of Wisconsin Madison, University of Alberta, University of Waterloo, University of Windsor, US Coast Guard Academy, Vanderbilt University, Worcester Polytechnic Institute, Yale University.

Their undergraduate institutions range from smaller liberal arts colleges (e.g., with enrollments of 800 undergraduates) to larger universities, including the University of Michigan itself (30,000 undergraduates).

Graduate Applications: Other Demographic Statistics

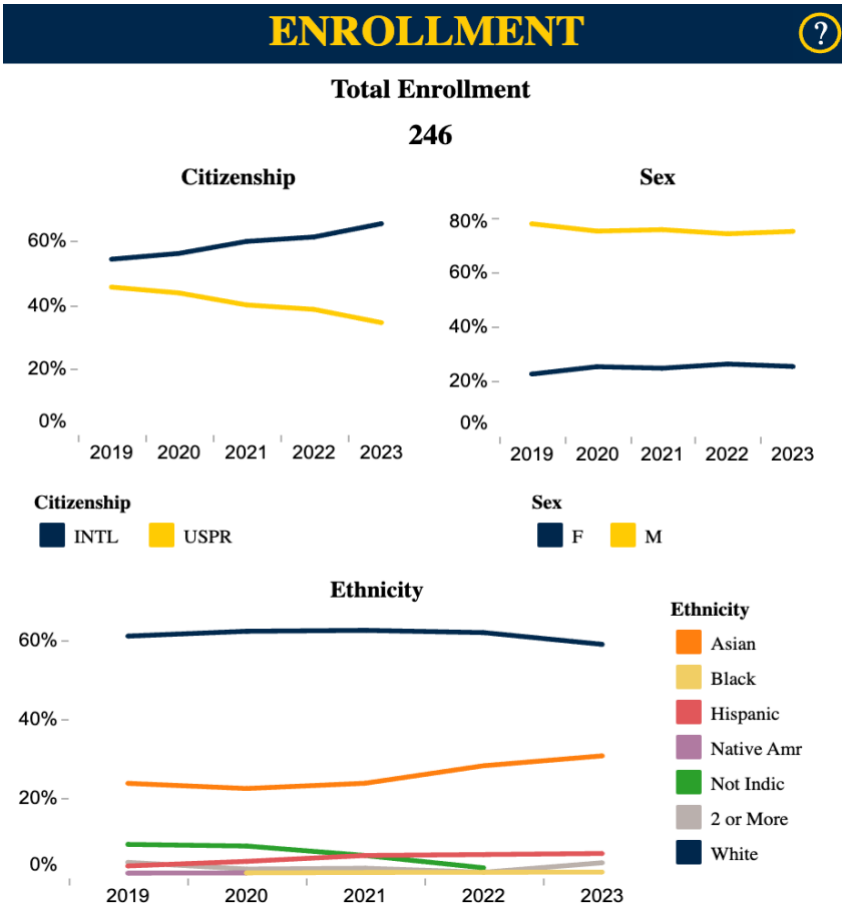
We also distinguish between domestic and international (non-resident) applicants and between male and female applicants. (In current tracking, both are reported as binary categories.)

	Applied		Admitted		Accepted	
	2023	2024	2023	2024	2023	2024
Total	3884	4580	418	457	172	220
Domestic	614	1003	179	239	82	120
Domestic Female	115	198	46	58	15	22
Domestic Male	499	805	133	181	67	98
International	3270	3577	239	218	90	100
International Female	707	861	71	57	22	19
International Male	2563	2716	168	161	68	81

Changes from previous year. Graduate applications as a whole continue to increase (about 18%). However, we note a smaller increase (or about 10%) increase in international applications. Despite this increase, the amount of international students admitted (both women and men) has substantially decreased.

Graduate Enrollment Trends

The Rackham Graduate School's Doctoral Program Statistics for Computer Science and Engineering include information about enrollment trends. Note that ethnicity information is only available for domestic students (US Citizens or Permanent Residents), and that CSE and Rackham present the data result in slightly different totals. This can be relevant for groups with low total numbers, such as underrepresented minorities.



Insights into the citizenship, gender, and ethnicity of students enrolled in Computer Science and Engineering for 2023. Ethnicity is reported only for domestic students (US Citizens or Permanent Residents). Hispanic students are excluded from the Two or More category. Categories with fewer than 5 students are not shown.

Graduate Degree Completion

CSE's Graduate Program Office provided data around graduate degree completion rates. CSE conferred 169 graduate degrees in Fall 2023 and Winter 2024, including MS, SUGS and Ph.D. Note that students receiving degrees in AY 2023-2024 entered the program in previous years. Their self-reported ethnicities were:

	Completed (ALL)		Completed (MS, SUGS)		Completed (PhD)	
	F23/W24	F22/W23	F23/W24	F22/W23	F23/W24	F22/W23
Total	169	142	153	124	16	18
2 or More	3	2	3	2	0	0
Asian	78	64	76	56	2	8
Black	0	1	0	1	0	0
Hispanic	3	4	3	4	0	0
Native American	0	0	0	0	0	0
Did Not Indicate	47	51	36	42	11	9
White	38	20	25	19	3	1

The Michigan Engineering Career Resource Center provides salary data on average salaries by area. For 2023, the reported Computer Science and Engineering salaries for students graduating with master's degrees were median $129,000, average $131,852, and range $80,000 – $175,000.

Changes from previous year. We continue to note an increase in degree completion, driven largely by more master's students completing the program.

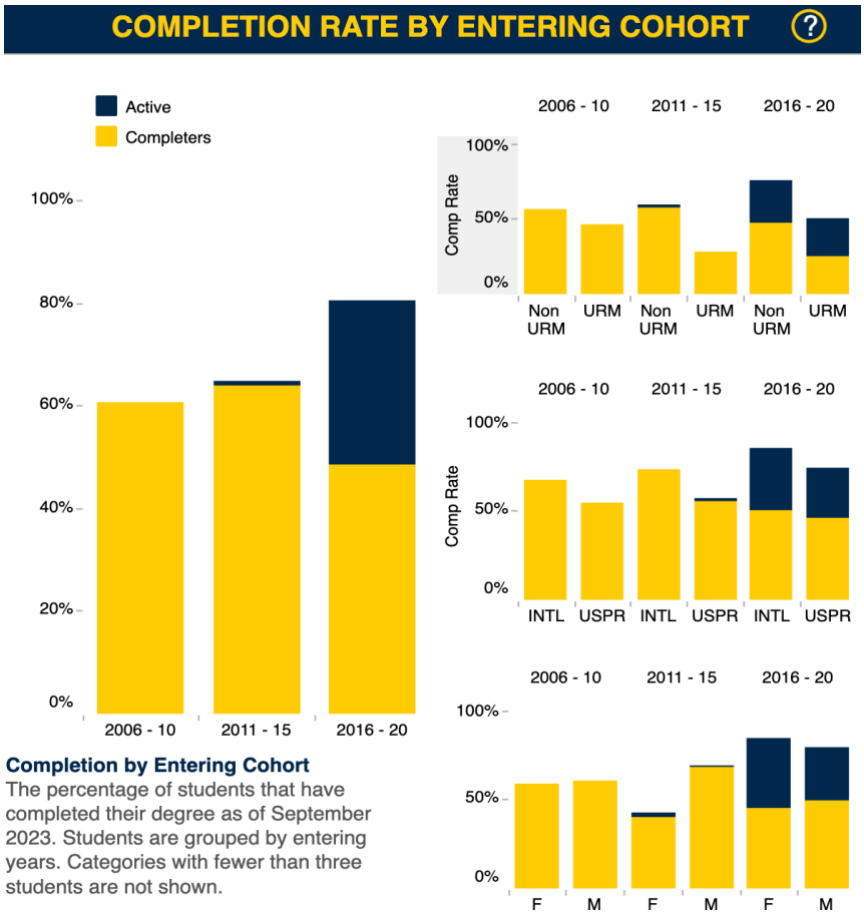
Graduate Degree Completion Trends

The Rackham Graduate School's Doctoral Program Statistics for Computer Science and Engineering include information about degree completion trends (see table on following page).

Graduate Degree Post-Completion Outcomes

John Gonzalez of Rackham Institutional Research tracks the "Rackham Career Outcomes Collection." Among CSE students graduating in 2023, 37 provided data on race/ethnicity and country of citizenship. Twenty-three students were considered international (not US citizen or residents) and 14 were considered domestic. Among domestic students (14), 6 self- identified as white, 5 as Asian, and 1 as multi-racial. Two(2) students did not indicate ethnicity. The remaining 23 students are considered international and thus no ethnicity information is available for them. Post-graduation data is available for 29 graduates. Among these graduates, 3 reported working in US-based universities as tenure-track faculty, 2 reported working as postdoctoral fellows, and 22 reported jobs at companies (e.g., Google, etc.), and the remaining did not report information. Since 2022 there was marked improvement in tracking graduates since 2022 with data available now for 78% of graduates' vs 19% in 2022.

Changes from previous year. The Rackham Career Outcomes Collection has not been updated for AY24. AY23 data has been preserved for this section.



The percentage of students that have completed their degree as of September 2023. Students are grouped by entering years. Categories with fewer than three students are not shown.

Graduate Program Context and Discussion

As a broad point of comparison, the 2023 Computing Research Association Taulbee Survey of 182 PhD-conferring CS departments found that 22.7% of enrolled CS PhD students were female, 77.2% were male, and .1% were nonbinary. This is a slight decrease for female students (2.2%). 2.1% of enrolled CS PhD students identify as Hispanic, while Black or African American students account for 1.2%. These percentages have not changed significantly from the 2022 survey.

CSE's graduate recruiting efforts currently show a strong focus on Research 1 Universities and highly ranked programs and a smaller, but growing, emphasis on community colleges, Historically Black Colleges and Universities, or other Minority-Serving Institutions.

CSE's enrollment rate for female PhD students continues to align with the national average. Demographic data regarding degree conferral should be interpreted with care due to small numbers. CSE's graduate application institution data suggests that many of our minority applicants come from the same small set of undergraduate institutions.

Faculty Recruiting

This section provides additional transparency on the processes associated with faculty recruiting. This information may clarify the context under which CSE strives to elicit a broad pool of applicants and make decisions to interview, recruit, and retain high-quality candidates.

CSE faculty recruiting activities are conducted and tracked internally, within the CSE division. While some candidates are interdisciplinary, ECE and CSE faculty recruiting and hiring within EECS are effectively separate and parallel.

CSE faculty hiring is overseen by **Faculty Search Committees**. While education and research are priorities for all faculty members, there is typically one committee each year for hiring research-focused faculty members and a separate committee for hiring teaching-focused faculty members (lecturers). This distinction is made because those faculty tracks involve slightly different activities (e.g., lecturers are typically tasked with teaching core undergraduate classes) and thus candidates demonstrate the qualifications in slightly different ways. The tenure-track search committee now includes a graduate student representative (from the CSE graduate student organization) as a full member.

While details vary from year to year and school to school, hiring a new faculty member requires support from higher levels of the University administration. Resources must be provided (e.g., space, salary), and as a result a faculty search is often given a finite number of **positions** to fill. Sometimes these are given over a longer period; a department might be given permission to fill three faculty positions over the next two years, for example. When a faculty member leaves or retires, permission is typically given to hire a new faculty member, often called a "replacement hire." Alternatively, when there is a strategic desire to grow a department (e.g., perhaps because many undergraduates are enrolling in its classes, or because its research is particularly successful), a department might be given permission to fill new positions. In some cases, a department might focus hiring on a particular subject matter **area** (e.g., to hire someone in machine learning). In other cases, a department might look to hire the best candidates on the market that year. In addition to the departmental positions that may be tied to priority subject areas, the College of Engineering always entertains additional hires, including "Target of Opportunity" candidates that fall outside priority areas of allocated positions. These can be considered special opportunities for various reasons, including (and most commonly) contributions to diversity. Per state law this cannot be based on identity but can be based on other factors, such as a demonstrated commitment to broadening the field.

The search committee drafts an official job description and notice which is posted publicly. Candidates typically apply in a November to December timeframe. The search committee reviews their application materials, which include essays, evidence of teaching, research and service success, and letters of recommendation. All faculty applications must include a DEI statement, in which candidates explain their record of activity and achievement in support of diversity, equity, and inclusion. The Faculty Search and Executive committees carefully review the candidates' DEI statements and activities as a first-class consideration (on par with research and teaching).

Starting in 2022, CSE introduced a **pre-screen** step in our evaluation process for all candidates. Since pre-screen is lower cost relative to a full interview, this was intended to help us consider more candidates who might otherwise have been overlooked, especially candidates from underrepresented groups and institutions.

After pre-screening, a small number of candidates are invited to **interview**. Interview invitation decisions are based on a combination of considerations, including targeted subject matter areas and candidate qualifications. The CSE faculty as a whole are involved in the process. For example, while the Search Committee is responsible for reading through all applications and bringing promising candidates to the forefront, all applications are visible to all faculty members. In addition, the various CSE Labs and Centers are explicitly consulted and meet to discuss and review applications from candidates in their subject matter areas. A key constraint regarding interview selection is time. It is typically not possible to host more than two, or in extreme cases three, interviews per week. Each interview is about a day and a half long, and includes a seminar presentation, meetings with individual faculty, meetings with student groups, and meetings with department chairs and deans. In addition, not all candidates are available at all times (e.g., they are often also interviewing at other schools), and thus interview time slots must be coordinated.

Feedback from anyone who has interacted with the candidate or the candidate's application materials is solicited after the interview. In particular, student feedback from student-only meetings, which often involve discussion of advising and DEI issues, are solicited via a student-facing portal and taken seriously in hiring discussions. Student feedback is often significant. In several cases over the past few cycles, DEI review as well as student feedback has led to significantly different rankings of candidates, relative to a counterfactual where we did not have or make use of DEI statements or student feedback. In some cases, faculty reached out and engaged in deeper discussions with students in order to reach a consensus.

In addition to student feedback, one teaching faculty is part of every tenure-track candidate interview. This is intended to ensure that each candidate's teaching skills are expertly assessed, and to help us identify climate issues that might arise due to candidate attitudes toward teaching-focused faculty.

Once interview feedback is available, the search committees, labs, and the faculty as a whole meet to consider whether or not to extend offers. Key considerations include target hiring subject matter areas (if any), candidate qualifications, the number of positions available, and whether or not the candidate meets department collegiality, climate, and professionalism standards. Interviews often have a significant impact compared to a candidate's record "on paper." While CSE-level hiring authority ultimately resides with the CSE Executive Committee, the chair contacts candidates and handles any negotiations, any faculty member can evaluate any candidate, and faculty **discuss and vote** on candidates in Lab (i.e., subject matter area) meetings.

A number of logistical nuances and uncertainties complicate the situation. For example, because the interview season spans multiple months, it may be necessary to decide whether or not to extend an offer to one candidate before another candidate has interviewed. Similarly, not all offers are accepted, so a department hoping to hire one faculty member might negotiate with the administration to have two outstanding offers simultaneously with the expectation that only one will be accepted. While this incurs the slight risk that more candidates might accept offers than expected, it mitigates the risk that a search cycle might produce no new hires. Conversely, a department will sometimes decide that no available candidate in a particular hiring cycle was above threshold.

Finally, sometimes faculty candidates intentionally choose not to report particular specific information or even the general fact that they are applying. Some candidates may not report ethnicity information, for example. In addition, while most faculty candidates just completed graduate degrees or postdoctoral research positions, a small number are more senior faculty or researchers at other schools or labs. A senior candidate, such as one who already has tenure at another institution, may choose not to reveal that an application is being made (e.g., to avoid friction at the current institution until and unless the application results in an offer) and may ask that the visit be publicly recorded as a general seminar, rather than a job interview.

These issues complicate **reporting**. Questions that might appear direct, such as "how many positions were available this cycle and how many minority candidates were invited to interview?", may be difficult to make precise. For example, if the administration offered a department three positions over two years, there may not be a definite answer for how many positions were available the first year alone, and if a senior candidate applied, the number of interviews may contain private information.

Faculty Recruiting and Diversity

Faculty hiring and employment are governed by applicable laws relating to civil rights and workplace discrimination, such as Michigan's Elliot-Larsen Civil Rights Act (at the state level) and Title VII of the Civil Rights Act of 1964 and Executive Order 11246

(both at the federal level). Like the Michigan constitutional provision discussed above, these state and federal laws prohibit discriminatory hiring processes (e.g., based on race or gender). Instead, there is a focus on producing a broad applicant pool that has as many excellent candidates as possible from all backgrounds.

To that end, search committee members are required to complete special training, namely the STRIDE Workshops offered by the ADVANCE Program, which "provides information and advice about practices that will maximize the likelihood that diverse, well-qualified candidates for faculty positions will be identified, and, if selected for offers, recruited, retained, and promoted at the University of Michigan."

The committee actively recruits candidates who increase the diversity of our application pool and/or have made strong contributions to DEI, e.g., through programs such as the AI Symposium (which highlights rising stars in AI from underrepresented backgrounds), Berkeley's Rising Stars program for women in EECS (where CSE faculty Reetu Das was an invited speaker in AY 2021-2022), MIT's EECS Academic Career Fair, and Michigan's NextProf workshops.

CSE also participates in the President's Postdoctoral Fellowship Program (PPFP), a postdoctoral fellowship intended to lead to a tenure-track offer after two years, assuming that candidates continue on a promising trajectory and conditional on a tenure-track interview. The program is particularly interested in scholars with the potential to bring to their research and undergraduate teaching the critical perspective that comes from their non-traditional educational background or understanding of the experiences of groups historically underrepresented in higher education. The department continues to monitor the program, but there is a perception that the PPFP is less attractive than an up-front tenure-track offer. With the competitive hiring environment for computer science faculty, the focus this cycle was on direct recruitment to a tenure-track position.

Changes from previous year. This cycle, we updated our interview process to have a designated meeting between each faculty candidate and a DEI committee representative, typically outside of the applicant's area of expertise. This encouraged a focused discussion on DEI-related topics. The feedback from the representative was entered into the system along with all other evaluations and was considered in making hiring decisions.

We also introduced Rackham Diversity Statement Evaluation Rubric into the Tenure-track Faculty Search evaluation process to more systematically evaluate DEI statements and contributions. Discussions around the balance between maintaining an inclusive climate and protecting individual expression as well as around our process for evaluating DEI statements and contributions continued this year. In particular, the DEI Committee connected with the Faculty Search Committee in which several ideas were generated to consider in the next cycle, including adding a separate text field in the candidate evaluation portal focused on DEI.

The search committee also continued to improve its interaction with graduate students. In particular, we offered an EECS 599 course last year to provide students with credit for attending faculty interview seminars. In addition to increasing student engagement in the search process, this was intended to help students gain a breadth of knowledge and experience that might better prepare and motivate them for academic careers. We had substantial engagement from students, and this year the course was split into CSE 599 and ECE 599 to accommodate the increasing enrollment.

Faculty Recruiting Statistics

In this Academic Year, CSE received 591 applications for faculty positions, of which 562 were for tenure-track positions and 29 were for teaching faculty positions. (The remaining data in this section aggregates across both tenure-track and teaching-track searches).

Only 145 of those 591 applicants (25%) chose to provide self-reported demographic information (a significant decrease compared to previous years).

Of those, 79% (115/145) reported as male and 21% (30/145) reported as female. (The College of Engineering currently tracks sex rather than gender in this context.)

Of those who self-reported demographic information, 67% (97/145) identified as Asian, 27% (39/145) as White, 2% (3/145) as Hispanic, and 1.4% (2/145) as Black. Some applicants listed multiple races or ethnicities. No applicants reported other races or ethnicities (e.g., American Indian).

We invited 38 of those 591 applicants (6%) to interview. Of the 38 interviewees, 16% (6/38) identified as female. CSE

extended job offers to 15 candidates: 80% (12/15) male and 20% (3/15) female.
As of this writing (early May), 5 candidates accepted offers (2 self-identified as female). Not all candidates with offers in hand have made final decisions as of this writing.

Changes from previous year. The total number of applicants increased significantly this academic year, from 442 to 591, due in part to a slowdown in industry hiring into research roles this cycle. Self-reporting of demographic data decreased significantly, from 38% to 25%. There was a substantial increase in male-identifying applicants, from 61% to 79%, and a smaller decrease in female-identifying applicants, from 24% to 21%. There was an increase in the number of applicants self-reporting as Asian this year, from 54% to 67%, which is similar to the percentage two cycles ago. We continue to receive very small numbers of applicants identifying as Hispanic, Black, or American Indian.

Faculty Recruiting Context and Discussion

As a broad point of comparison, the 2023 CRA Taulbee Survey reports that 22.7% of CS PhD degrees granted were received by female students. While not all faculty candidates are new PhDs, 21% of CSE's applicants (down from 24% last year), 16% of CSE's interviewees (down from 39%), and 20% of CSE's offers (down from 33%) for faculty positions identified as female. This is a significant regression compared to last year, where there had been significant progress. More work remains to be done.

Some have suggested that CSE might implement something akin to the "Rooney Rule" for faculty hiring, in which at least one minority candidate must be selected to be interviewed during each faculty search cycle. This approach may not be legally permissible, but the situation is also complicated by low total numbers and low ethnicity reporting rates. Given the low total numbers of interview candidates with reported ethnicities, providing evidence that at least one individual from each of various underrepresented groups was interviewed could be misinterpreted as tokenism. Instead, search committees can take steps to broaden their outreach efforts to promote greater diversity in their applicant pools. In addition, job postings can require a commitment to DEI, as reflected in scholarship, teaching, or service, and for search committees to use the strength of a candidate's rating on that criterion as a factor.

Care must be taken when interpreting minority ethnicity information. If 1.3% of PhDs produced nationally were awarded to Black or African-American students (19 such degrees from hundreds of schools in 2021), hiring cycles in which Black candidates were interviewed (such as the 2020-2021 Academic Year) would appear significantly above that average, while cycles in which no Black candidates were interviewed would appear below that average. Pipeline concerns and small- number reporting difficulty do not eliminate responsibility; it remains incumbent on CSE to ensure that the applicant and interview pools are as broad as possible.

Efforts to actively cultivate several candidates from underrepresented groups (prior to the application/interview/hiring periods) did not increase the racial diversity of our applicant pool, interviews, and offers for this AY, so more work remains to be done.

A number of considerations, from the public perception of CSE's climate and allegations of faculty sexual misconduct, might continue to be having a negative impact on our ability to recruit strong candidates across demographic groups, but we are not able to determine the relative impact of this factor over other factors, e.g., an overall competitive hiring environment. We encourage caution when interpreting small numbers but note that CSE must carefully consider similar information to determine if potential negative trends are emerging.

Participation in self-reporting of demographic data remains a challenge, with the vast majority of applicants choosing not to report their gender or race on their application. Many applicants are applying to large numbers of institutions, so this may simply reflect time management considerations. Alternatively, there may be an impression that applicants do not benefit from disclosing this information to hiring committees. It is unclear whether there are disproportionate reporting rates between groups, and if so, in which direction this bias lies.

CSE Sentiment

In addition to town halls and other community gatherings and engagement described later, CSE was also the subject of an external climate assessment and organized two different approaches to determining sentiment: an analysis of course surveys and a check-in process with graduate students.

Climate Assessment Committee

In 2021, the Climate Assessment Committee (CLASS) was charged with overseeing an independent review of the overall culture and climate in CSE and hosted two virtual community events in September to share results and recommendations from the external firm. The "Towards the Future" survey findings were also published in a public report.

Issues including oversubscribed courses, the need for more support and participation for underrepresented students, and allegations of sexual misconduct involving CSE faculty were cited as factors for examining CSE's climate more closely.
Recommendations from the assessment, presented at the community meetings, fell into three categories: steps to improve diversity, equity, and inclusion; steps to heal past sexual misconduct issues and rebuild trust; and steps to address concerns regarding the student academic experience.

Some of the specific recommendations, such as "Further develop mentoring programs," "Have the University offices responsible for compliance with policies and conducting investigations appear on campus to answer questions," or "Training on 'imposter syndrome' and other ways to encourage people to speak up", have associated efforts already underway (see later in this report). Others, such as "Improve recruiting of Underrepresented individuals for all Faculty and Staff Positions," "Make training on misuse of power imbalances a requirement for Faculty and Staff," and "Foster group work among

Students and in so doing, review the Code of Honor and determine if any changes are required to help foster proper and appropriate group work among Students," remain longer-term processes. Finally, some recommendations, such as "Leadership should identify and concisely set forth the goals as to Student-to-Faculty ratio at the various Student levels and evaluate what is needed to achieve the ideal ratio," are explicitly addressed as part of the Strategic Action Plan efforts undertaken by CSE and summarized later in this report. In that regard, the results of the assessment are helping to shape CSE policy going forward.

Climate Questions on Course Surveys

In Winter 2020, the DEI Committee added climate- and inclusion-focused questions to the end-of-semester course evaluations for all CSE classes. This included three quantitative (Likert scale 1-5) questions and one qualitative (free response) question. For AY23-24, the responses were fairly positive and consistent with prior years:

Fall 2023

- 4.75 – The instructor treated students with respect.
- 4.55 – I felt included and valued when working with other students.
- 4.45 – I felt comfortable asking questions in class.

Winter 2024

- 4.77 – The instructor treated students with respect.
- 4.52 – I felt included and valued when working with other students.
- N/A – I felt comfortable asking questions in class.

Each semester, ~2000-6000 responses are collected in response to the qualitative question "How might the class climate be made more inclusive of diverse students?" A separate, full report on these responses is currently being developed and is planned to be released publicly to the community. The public-facing report will elaborate on the kinds of suggestions that students submit, as well as high-level trends across courses.

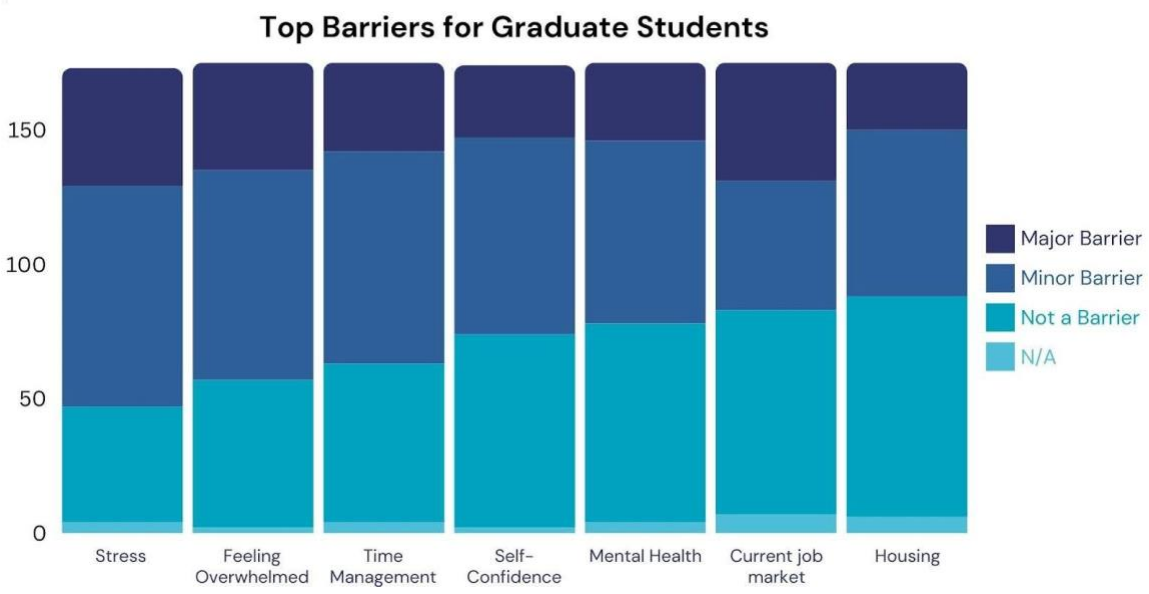
Changes from previous year. The averages for the Likert scale questions remain similar to prior years. Additional questions were added to the evaluations starting in W24, so "I felt comfortable asking questions in class" has been removed from course evaluations.

Graduate Student Check-Ins

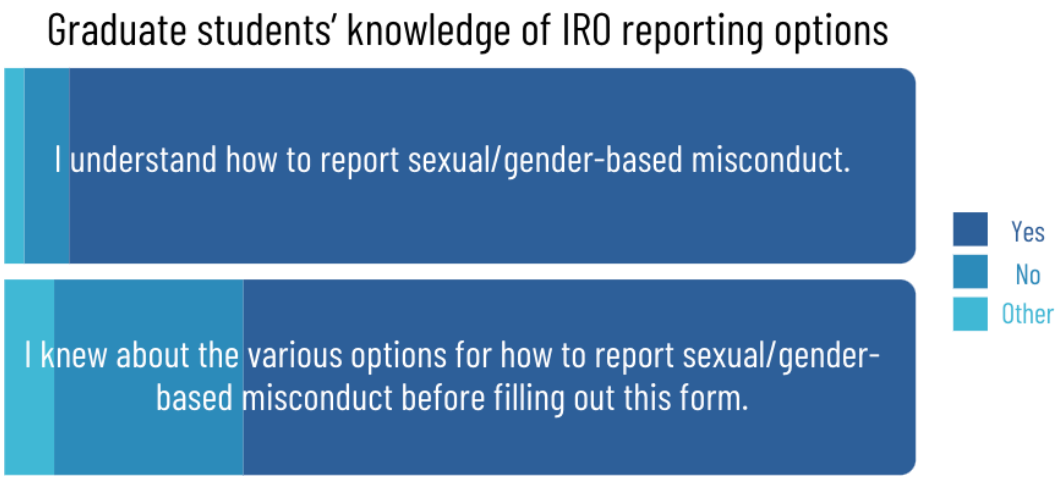
Starting in 2020, CSE started the annual process of conducting one-on-one check-ins with graduate students. The check-in process includes collecting qualitative data via 15-minute Zoom interviews with value-neutral questions, and quantitative data through a 30-question online survey sent to all Master's, SUGS, and PhD Students. Per student request, this year the Zoom interviews are offered only to new students and students who have indicated a concern in prior years. Goals of this initiative include continuing to learn about graduate-level concerns, identifying students who might benefit from additional support, and hearing from all students (including those, such as first-generation students or non-native English speakers,

who might not reach out to us).

We summarize the 183 received responses. Consistent with prior years, most graduate students continue to report that they are doing well on average and are having generally positive experiences with CSE staff, professors, teaching staff, and fellow students. Most graduate students rate student/faculty relationships and the clarity of program expectations as "excellent," "very good," or "good", and most report knowing who to talk to about procedures. Most students rate their sense of community highly, with less than a quarter describing their sense of community as only "poor" or "fair."



Over 70% of students reported that stress was either a major or minor barrier to their own success. Feeling overwhelmed, time management, mental health, and self-confidence were also top barriers to their own success. New this year, over half of graduate students consider the current job market to be a major or minor barrier to their success.



Similar to last year, about 20% of students reported that they did not know about the various reporting options for sexual or gender-based misconduct prior to filling out the survey. The survey listed the three options for reporting (sharing the experience with an IRO, filing a formal report through the Equity, Civil Rights, and Title IX Office, or reporting via the anonymous dropbox in Tishman Hall, or through the online form) and based on these findings, it seems that more advertising of these options, as well as confidential resources (such as the Sexual Assault Prevention & Awareness Center), is needed.

A separate, full report on this activity over the last several years is currently being developed and is planned to be released publicly to the community. The public-facing report will elaborate on the concerns above (both by abstraction and through select

anonymized student quotes), highlight any issues of department communication and transparency, and give constructive feedback to advisors about activities that correlate with positive student satisfaction (advisor communication, collaboration, and work-life balance) as well as activities that correlate negatively with student satisfaction (micromanagement, apathetic communication, and lack of a second supporting faculty member). Once published, a discussion will be planned with CSE faculty and other relevant parties.

Changes from previous year. Following student requests, the face-to-face portion of the check-ins were only held with new students and those who have expressed a prior concern. Overall, the reported issues and their relative priorities are very similar to last year. Following additional feedback, this activity will be paused for AY24-25.

Climate and Diversity Activities

CSE students, faculty, staff and community members organize a number of DEI, climate and outreach activities. These include both grassroots activities that grew organically as well as CSE-wide or -sponsored actions.

Community-Wide Engagement

During this academic year, CSE's DEI Committee published a report detailing their activities during the Fall Semester as well as priorities for the Winter Semester. The full report can be found here and three new activities of note are summarized below:

- **IA Community Building Initiative**. Sindhu Kutty, Shelby Eddy, Rachel Germaine, and Sarah Snay formed a subcommittee in F21 to focus on undergraduate IA support. Due to reports from undergraduate IAs that much of the harmful behavior they experience is from the students they are supposed to be supporting, the committee held a focus group and collected survey data from students to get a better sense of their experience and ways we can support them. In F23, they launched the IA Collab, which is an IA-focused community-building initiative.
- **Undergraduate Mentoring Program**. This program began as a pilot in F22 and has continued every semester since then. The goal of this program is to provide more support for students (particularly from underrepresented groups) as they transition into the major and take EECS 183, 203, 280, and/or 281. In year one of this program, four mentors and 17-23 mentees participated each semester. In year two of this program, five mentors and 25-30 mentees participated each semester.
- **Neurodiversity**. As a follow-up to last year's conversation, the DEI Committee invited Christie Zablocki and Kat E. Nic - Representatives from Student Accessibility and Accommodation Services to talk about Academic Support and Access Partnerships (ASAP). Moving forward, the committee wants to expand the discussion to include undergraduate students.

A dynamic we noted during town halls in previous years was that concerns regarding the experiences of students of color and women were often not addressed. Therefore, a continued priority for the DEI Committee is direct outreach to student organizations in order to have focused conversations regarding climate with their constituents. In Winter 2024, two members of the DEI committee and one faculty member attended a SWE meeting to host a conversation around support systems for women in STEM in the College of Engineering. There were around 50 participants at this meeting, which included small group discussions.

The DEI committee continued outreach efforts to **meet with student organizations**. These typically lasted an hour and included introductory remarks followed by listening to concerns and brainstorming ways CSE can offer support. This year, meetings and outreach included ColorCoded, NSBE, GradSWE, and GSBES. Some of these meetings led to further collaboration with CSE. For example, CSE DEI helped sponsor a Black Professor Panel during Black History Month hosted by NSBE.

In contrast to previous years, CSE's DEI Committee has focused on such smaller conversations (which can be specialized to student contexts) rather than large town halls.

EECS will hold a fifth annual Juneteenth Celebration to observe the Juneteenth holiday marking the end of chattel slavery. It will be held in person for the first time at Duderstadt Center Gallery and the Gerstacker Grove. he event is sponsored and organized by CSE and ECE. This year's theme, *Celebrating Excellence in People-First Engineering and Computing*, will include two guest speakers, a performance of the Black National Anthem, a reading of the Emancipation Proclamation and history of Juneteenth, and a panel discussion on the importance of empowering and uplifting our Michigan communities

through STEM.

CSE Program Activities

In AY 2023-2024, CSE paused its inclusive teaching training for instructional assistants and graduate student instructors. **Inclusive teaching training** efforts will begin again in both the Fall and Winter semesters, and will target all teaching assistants from multiple classes. The 90-minute sessions include information on topics such as implicit bias, stereotype threat, and imposter syndrome and include hands-on discussions. The advanced workshop reviews the content of the introductory workshops but also focuses on difficult scenarios that might come up in teaching. In Fall 2022, 69 students attended the standard training, and in Winter 2023, 51 students attended the standard training and 107 attended the advanced training (compared to 71, 123, and 74, respectively, in Fall 2021 and Winter 2022). The inclusive teaching training offerings were well-received by instructional aides. For Winter 2023, 79% of the standard attendees gave the training workshop an "A" grade, and 87% of the advanced attendees gave it an "A" grade

Waiting lists for upper-level computer science classes are a critical undergraduate climate concern. Recently, CSE expanded its upper-level CS technical elective and capstone course Spring and Summer offerings based on the anticipated demand. This included **course offerings** of EECS 441, 481, 482, 484, 485, and 495. CSE added sections in several high-demand courses including EECS 481, 485, and 493 based on availability of instructors and prioritizing courses with high demand.

Waiting list and capacity concerns remain significant but nuanced. For example, in AY 2022-2023, CSE expanded EECS 445 to 6 sections, raising enrollment capacity from 480 to 720 students. Despite this, there was still a waiting list for EECS 445. Addressing Enrollment and Admissions concerns through multiple approaches (including raising capacity and implementing major selection policies) has become a key focus of CSE's Strategic Action Plan.

CSE eliminated the GPA requirement for declaring the CS-LSA major. Previously, students were required to achieve a 2.5 GPA over the prerequisite courses (Math 115, Math 116, EECS 203, EECS 280) taken at U-M to be eligible to declare CS-LSA. While students who meet the GPA requirement do tend to be better prepared for upper-level CS courses, the policy required students who do not meet the threshold to retake courses, which negatively affected those on financial aid or who do not have time in their schedule to retake a course. The CSE faculty determined that the negative consequences outweigh the benefits of this policy, so they voted to eliminate the GPA requirement as of Fall 2022.

CSE uses physical and cryptographic **anonymous dropboxes** for community members to leave feedback or discuss climate concerns. Between June 1, 2021, and June 1, 2022, 38 comments were submitted via the dropbox (of which 4 included sender follow-up information and 34 were wholly anonymous). Between June 1, 2022 and June 1, 2023, 9 comments were submitted (of which 8 were anonymous). This represents a decreasing trend in reported concerns. We speculate that many commonly reported topics in past years (e.g., COVID issues, discussions related to allegations of faculty sexual misconduct) have been partially addressed, and others (e.g., instructional aide concerns, graduate student lab concerns, etc.) have been increasingly handled via check-ins and surveys of those groups. Students and community members are welcome to use these anonymous mechanisms for any topic.

In AY 2020, CSE expanded the number of questions related to climate and DEI activities in **faculty annual reports**. For the 2023 report, 57 of the faculty with reports available elected to respond with detailed summaries of their DEI activities. Faculty annual report data is used by CSE when considering certain raises and awards. In addition, CSE continues to consider ways in which faculty can voluntarily include certain structured DEI activities (such as attendance at STRIDE workshops and CRLT Engineering workshops) in **promotion and tenure casebook materials**. CSE continues to offer new faculty members monetary research award incentives to attend extended training. One medium-term goal is to see if faculty are applying what they are learning in such workshops in the classroom and to consider alternative ways to evaluate teaching.

CSE Associated Groups, Programs, and Activities

Many programs, groups, and activities have a large number of student and faculty organizers; for brevity, we list a few contacts for each program and include links for more information.

The Computing CARES program aims to broaden participation in computing, particularly for women, through fundamental changes to how classes are taught. It organizes inclusive teaching training, community-building, and survey activities. Valeria Bertacco and Amir Kamil, among others, organize the program.

The CS KickStart program is a weeklong introduction to computer science for Michigan students with little to no experience. It includes hands-on coding instruction, meeting other students, and career exploration. Emily Abrams, Abby Hart, Jessica Zhang, and Maurice Tobiano, among others, organize the program

Discover Computer Science (EECS 110) is a two-credit course designed for any student who is interested in exploring computer science but doesn't have formal programming experience, and is particularly designed to support women and underrepresented minorities. Students in the course learn to write code; learn core computing concepts; explore interdisciplinary computer science applications; attend upper-level student, graduate student, and CS industry professional panels; and interview CS graduate students. Laura Burdick and Rada Mihalcea, among others, have organized and taught this course

EECS 601 Intro to CSE Graduate Research is a one-credit seminar series designed to introduce new graduate students to the skills needed to be a successful graduate student researcher in CSE. Rotating speakers give perspective on the research process, time management, publishing in CS, managing the highs and lows of grad school, working with your advisor, career paths, etc. The goal is to give students the background knowledge and perspective needed to be successful in grad school, as well as to help develop non-technical skills such as presenting and self-promotion. Additionally, this course offers an opportunity for incoming students to meet their cohort and connect with the wider CSE research community. Lauren Biernacki introduced the course and taught it with Quentin Stout. This year, Alanson Sample and Michael Wellman have been teaching the class with support from Magda Calvillo.

The Explore Graduate Studies program helps undergraduate students understand and prepare for graduate school in computing through an annual daylong workshop that includes application writing clinics and faculty panels. Roya Ensafi and Maggie Makar, among others, organize the program.

The Explore Computer Science Research program involved 20 students this year, including women and underrepresented minorities, in the research process. Students give project presentations at the end of each year and attend CS research panels where they connect with CS research professionals and learn about interdisciplinary opportunities to apply CS research. Andrew Lee, Aylin Gunal, Rachel Germaine, and Rada Mihalcea, among others, organize the program.

The Girls Encoded program, which was designed to address gender underrepresentation in computer science and engineering, provides outreach and research mentorship for all interested students. Laura Burdick, Rada Mihalcea, and others organize the program.

This year, CSE ran a series of Graduate Fellowship Workshops. The workshops provided application preparation to help students seek fellowship funding. Ryan Huang organized the program this year. This year, five CSE students were awarded the fellowship.

CSE faculty are involved in the M-STEM Academies, a co-curricular summer program that supports students as they transition from high school to the first two years of college.

The Undergraduate Mentoring Program is a peer mentorship program that started in F22. This program seeks to offer social support to students (especially from underrepresented groups) as they transition into the major and are taking EECS 183, 203, 280, and/or 281.

Women in Computing is a CSE seminar series that brings in distinguished women researchers to discuss their work and meet with faculty and students. The series was initiated by Rada Mihalcea and is currently organized by Maggie Maker. It traditionally includes a roundtable with interested students.

In addition, CSE sponsors, mentors, or otherwise supports and recognizes a number of student groups or programs that participate in climate- and DEI-related activities. These include, in brief summary:

- ColorCoded – Student organization focused on community, experience, and learning opportunities for student from underrepresented populations in CS, CE, and Information
- CSEG – Computer Science and Engineering Graduate Students • VoiCSEs – Graduate Student Voices of CSE
- ETC – Engineering Teaching Consultant Program
- GEECS – Girls in Electrical Engineering and Computer Science
- HKN – Eta Kappa Nau, International Honor Society of the Institute of Electrical and Electronics Engineers • KTP – Kappa Theta Pi, Co-Educational Technology Fraternity founded at U-M

- NSBE – National Society of Black Engineers
- oSTEM & GoSTEM – (Graduates) Out in Science, Technology, Engineering, and Mathematics • SHPE – Society of Hispanic Professional Engineers
- SWE & GradSWE – Society of Women Engineers

CSE also coordinates with College of Engineering-level DEI activities, including the CCE Staff Network, OCCE Faculty Committee, and the CoE Dept. DEI Program Coordinators. At the national level, CSE also participates in the LEAP Alliance.

During AY23-24 continual effort was dedicated towards increasing outreach to transfer students. Two DEI staff members and one CSE faculty member met with Henry Ford Community College, Grand Rapids Community College, Mott Community College, Lansing Community College, Oakland Community College, Schoolcraft College, and Washtenaw Community College STEM Scholars to share information about CSE's undergraduate programs. CSE's DEI Project Manager also attended both of the College's WCC application information sessions to answer questions and serve as an early point of contact for any students interested in CSE. In Winter 2024, the DEI Committee facilitated an "Application Workshop" for Schoolcraft College students to help them navigate the new Application/Enrollment process. We anticipate broadening these efforts to reach more community college students during the next academic year.

Financial Commitments

We also report resources allocated at the CSE level to climate and DEI activities. The following list includes initiatives CSE has fiscally supported during the 2023-2024 academic year.

- Conference Sponsorship of Richard Tapia Celebration of Diversity in Computing Conference and the Grace Hopper Celebration highlighting women in computing. Registration passes are often included in sponsorship packages; for example, CSE supported the registration for 10 students (3 students from GEECS) for Grace Hopper and 3 students for Richard Tapia.
- As part of the sponsorship package, CSE sends faculty and staff to the conferences to represent U-M and to recruit students into our programs. The College of Engineering specifically sponsored the Society of Hispanic Professional Engineers and the National Society of Black Engineers convention. Mahdi Cheraghchi attended the CMD-IT/Tapia Conference and NSBE this academic year, and CSE staff participated in recruiting prospective students at these conferences as well.
- Direct financial support was given to U-M students organizations (NSBE and SHPE) to participate in national conferences. New this year, 5 students from NSBE were supported to attend the AfroTech conference.
- Additional financial support for student groups. This year we provided additional funding to the GradSWE. This additional funding often took the form of CSE sponsoring student organization programs (e.g., Black History Month Celebration).
- CSE hosted our fourth annual Service Awards for Excellence in Diversity, Equity and Inclusion. The award was one way that CSE aims to support graduate students who put uncompensated time into improving the climate and culture in CSE. Eight Graduate students were selected to receive the award.
- In Winter 2024, CSE hosted its second annual Graduate Recognition Reception to celebrate the contributions graduate students have made to CSE over the past year. During the program, this year's DEI Service Awards and CSE HACKS Spirit Award were presented to honor those graduate students who made contributions to improving the climate and culture at CSE and embodied the spirit of the HACKS values.
- CSE funded the pilot of the Undergraduate Mentoring Program for Fall 2022. Since then, five mentors have been compensated for their work over the semesters, and many community-building events were organized and funded.

Raw numbers can be difficult to interpret because they vary with the size of the department. For context, we use CSE Faculty Search as a point of comparison. Faculty Search includes travel and hosting reimbursements, staff time, seminar organization and similar activities, and is viewed as a core CSE activity typically involving 30-40 interviews each year. Each year CSE spends approximately **twice as much** on the climate and diversity activities listed above as it does on Faculty Search (compared to Faculty Search the year before COVID, to avoid conflating its reduction in travel). Spending money on processes does not guarantee desired outcomes, but this does indicate the relative fiscal importance of DEI activities to CSE.

CSE's *DEI Project Manager* started in June 2021, providing around 2,080 dedicated hours toward DEI efforts in CSE. The Project Manager's role is focused on coordinating and leading efforts at the student, staff, and faculty level. In addition, CSE has a full-time dedicated *Outreach and DEI Administrative Coordinator*. The Outreach and Administrative Coordinator's role is focused on working with student groups (e.g., our OUTdoors social activity) and reaching out to students (e.g., the 15- minute check-ins and surveys of graduate students). As of 2024, Taj Williams is the DEI Project Manager and Sarah Snay is the Outreach and DEI Administrative Coordinator. Part of the impetus of maintaining two DEI staff positions is to ensure

that there is capacity for both to take ownership of critical strategies and goals to improve the culture in CSE. It should be noted that these hours do not include the unpaid effort that is put forward by many in the CSE community on a regular basis.

Strategic Action Plan

Strategic planning is a process of defining our values and goals and then making decisions (including resource allocation) to attain them. Aspects related to climate and DEI, such as culture and community, are integral to CSE's strategic planning. Sustained focus on the goals and priorities established in the CSE Strategic Action Plan will help to ensure that we continue to improve in meeting the needs of our members and strive toward even greater levels of excellence.

To shape CSE as a thriving division for students, faculty, and staff, we commenced a Strategic Action Plan process on September 3, 2021, with leadership from 23 faculty and staff members. Four teams composed of faculty and staff – Mission, Vision, Values; Culture and Community; Enrollment and Admissions; and Computer Science Knowledge – worked to create the substance of the Action Plan through gathering relevant research and input from a variety of stakeholders. The teams deliberated through the 2021-22 academic year, with the process culminating in the articulation of a mission, vision, and set of core values, along with key priorities and goals to guide CSE in taking action over the ensuing five years to help the division become an even better place to learn and work. CSE's website includes an Executive Summary of the Strategic Action Plan process and outcome.

Strategic Action Plan Implementation: Year 2

CSE is a sizable organization and a wide variety of implementation activities occur across committees, faculty research lab groups, and staff teams. The faculty and staff attending the May 17, 2024, CSE annual retreat provided examples of programs, initiatives, and events undertaken over the AY 23-24 that contributed toward achieving our goals. The following provides examples of actions supporting our Year 2 progress.

Priorities and Goals – Culture and Community

Culture and Community, Priority 1: **Develop and evolve systems and programs to promote student, faculty, and staff success and well-being.**

- *Goal 1.A: Enhanced community members' engagement in CSE and sense of connection with one another.* A number of faculty, staff, and students were very intentional in organizing events and initiatives to foster support, belonging, and resources for success. Examples include:
    - Instructional Assistant monthly meetups
    - Student research poster sessions
    - Professional development opportunities for staff
    - Heritage Month celebrations: Black History Month, Women's History, AAPI Month, Pride Month, etc.
    - New student welcome
    - AI Tea monthly faculty-student get-together
    - International dinner for first year PhD students
    - EECS Carnival for students in intro courses to meet each other

- *Goal 1.B: Improved student learning experiences through support and attention to health and well-being*. A heightened awareness emerged as we transitioned from the conditions of the pandemic of the need to attend to student well-being in various ways. Student-facing units such as undergraduate course support staff, the Undergraduate Advising Office, and the Graduate Office play an important role in providing and promoting the evolution of resources to improve the learning experience. Additionally, faculty of several courses have pursued initiatives such as engaging the U-M Foundational Course Initiative to assess curricula and teaching impact. Activities included:
    - Comprehensive Studies Program sections in EECS 183, 203, 280
    - Imposter syndrome lecture in EECS 280
    - Coordination with CARE Center for students
    - Change of advisor processes and support
    - Individual and group coaching for PhD students

- *Goal 1.C: Harassment-free workplace and environments for learning.* Ensuring a safe and harassment-free place to learn

and work is an ongoing charge for both CSE and the University overall. CSE has continued to evolve effective policies and processes, including referencing resources provided by the new Equity, Civil Rights and Title IX Office. Examples of CSE actions include:

- Staff feedback on faculty surveys
- Proactive notification of faculty candidates of historical concerns
- Discussions in mandatory PhD courses, such as EECS 601
- Outreach to students who may not volunteer information through faculty and advising
- Informal and new mentorship programs

- *Goal 1.D: Impactful promulgation of CSE values.* It is important to articulate expectations for how one should strive to participate in a community. Awareness and appreciation of the CSE HACKS (Honesty, Achievement, Cooperation, Knowledge, Service) values has grown significantly over the past year. Select activities to engage faculty, staff, and students in learning the values include:
  - Visible messaging of values, including communications materials that include HACKS: CSE website, brochure, stickers ○ Faculty HACKS discussion with IAs in EECS 280
  - Graduate student award for embodying HACKS values
  - CSE 543: Ethics for AI and Robotics

Culture and Community, Priority 2: **Increase diversity across the Division (students, staff, IAs/GSIs, faculty).** Please refer to other sections of this report for an extensive list of programs and initiatives that work in pursuit of this priority.

- *Goal 2.A: Growth in the number of members of underrepresented groups amongst undergraduate and graduate students, faculty, and staff.* Attracting students, faculty, and staff from groups typically underrepresented in CS is an ongoing challenge for the Division, but a significant priority nonetheless. Examples of activities over the past year include:
  - Engagement with the MACSS Scholars Program
  - Enrollment pathways development: community college connections and bridge programs
  - EECS 110: Discover CS, with 70% women students
  - Explore CS Research
  - RENEW CS
  - Enhanced PhD admissions committee focus on underrepresented students and diversity

- *Goal 2.B: Initiatives for support and retention of members of underrepresented groups.* Recruiting members of faculty, staff, and students is only one aspect of building a diverse community. It is important to provide ongoing support and resources to promote success and retention as well. The following are a few examples of CSE efforts:
  - Undergraduate mentoring programs for students from underrepresented groups
  - Comprehensive Studies Program (CSP) course sections/initiatives
  - DEI Committee annual meetings with student organizations
  - Graduate student coaching
  - Explore CS Research experiences for women and URM students
  - Staff two-part allyship training

Culture and Community, Priority 3: **Improve CSE communications to enhance the quality of interactions and better meet the needs of students, staff, and faculty.**

- *Goal 3.A: Communications in a diverse world skills for faculty, staff, IAs/GSIs and students.* People of the world have never before been as interconnected by various communications vehicles as they are in the current era. However, building relationships, engaging in collaborations, and effectively transmitting complicated information within a complex matrix of diverse perspectives requires learning, modeling, and mentoring of necessary skills. CSE, together with ECE, has begun to incorporate this training into course curricula and teaching practices, and through other types of engagement:
  - EECS 601, Intro to Grad Research: includes technical communications skills, and approaches for cultivating higher quality interactions with advisors and colleagues
  - IA/GSI training: Evolving training approaches considering how to be more effective in teaching and supporting diverse students
  - e-HAIL experiences teach research and grant writing
  - Grad student coaching assists with communications and connection-building

- *Goal 3.B: Increased communication and feedback pertaining to the creation, refinement, clarity, and distribution of information about formal policies and procedures.* CSE is a large department within a large institution and it is challenging to ensure that members of our community are aware of various policies and key resources. Transparency has been a notable theme over the past several years, as has improving awareness of information important for navigating work and learning environments. Some steps that have been taken to improve communications:
    - Undergraduate Advising Office improvement of information for students about program policies
    - Advising team began monthly emails with the students on their caseloads
    - Information provided about new enrollment policies
    - Grad program enhancement of posted information about program policies
    - New Onboarding Committee was created
    - Chair's "Odd Tuesday" messages
    - CSE Faculty Slack added staff participation

Culture and Community, Priority 4: **Lead in improving the culture and community of computing as a field.** We want to not only promote well-being, diversity, equity, and belonging in our CSE community, but also strive to shape the wider computing culture as well. This includes improving the practices used by industry and other organizations to recruit and develop our students in their careers.

- *Goal 4.A: Creation of best practices for industry-academia engagement for healthy and collaborative exploration of post-graduate opportunities and outcomes for continued participation in computing.*
    - AI Lab industry partner program
    - e-HAIL industry partners conversations
    - Graduate Programs Office alumni-master's student mentorship program
    - CSE National Advisory Board reboot:
        - Meaningful conversations with CSE students were conducted at Oct. 2023 meeting
        - New Alumni Engagement and Regional Tech Development Committees have CSE student needs at the center of their initiative planning
        - A CSE alumni-student mentoring event was held in April 2024

- *Goal 4.B: Recognition and reward of contributions for shaping the culture and community of the computing profession.*
    - HACKS Award for graduate students
    - CSE Staff Excellence Rewards
    - Grad student recognition dinner

Priorities and Goals – Enrollment and Admissions

Enrollment and Admissions, Priority 5: **Create a new multi-pathway admissions model that caps the number of CS majors but allows for control over class composition and promotion of more diversity.** Significant progress has been made over the past year in implementing the first phase of the new CSE admissions model to achieve a more optimal faculty/student ratio.

- *Goal 5.A: Preferred major admissions process for first-year U-M applicants.*
    - Created and implemented, with U-M Office of Undergraduate Admissions, an Advance Selection process using holistic criteria developed in collaboration with CSE faculty and staff. Year two admissions to this pathway was in the process of completion at the writing of this report.

- *Goal 5.B: Admissions process for current U-M students who discover interest in CS.*
    - Completed application process and policies for implementation WI 2024 aimed at students who newly discover CS after matriculation at U-M. Admissions applications were accepted April 1-May 15, 2024
    - The first group of Enrolled Discoverers will be selected mid-June 2024
- *Goal 5.C: Effective pathway for external transfer students from community colleges and partner institutions.*
    - CSE DEI and enrollment specialist staff have continued outreach work with community colleges to build a transfer pathway facilitating entry to the CS undergraduate majors

- *Goal 5.D: Targeted access pathway admissions for students from bridge programs*
    - Partnering with the Math, Computer Science and Statistics (MACSS) Scholars
    - Exploring other opportunities with existing bridge programs

Enrollment and Admissions, Priority 6: **Engage in enrollment management practices to balance student demand for courses with available space and teaching capacity.**

- *Goal 6.A: Systematic approach to course access management according to major status and other parameters.*
    - Associate Chair and Undergraduate Advising Office have been working to pursue course registration procedures to address diverse student enrollment needs.

Priorities and Goals – Computer Science Knowledge

Computer Science Knowledge, Priority 7: **Review, and revise if needed, the CSE curriculum and program structure (undergraduate and Master's) to ensure effective provision of the skills, knowledge, and teaching strategies appropriate for different user groups and ongoing course and program integrity.**

- *Goal 7.A: Exploration of the role of CSE in the broader area of computer education at U-M.* This is an ongoing issue as CSE is challenged to meet the ongoing demand for teaching thousands of students taking its introductory course sequence, as well as addressing the continued growth of students desiring to major in CS. One alternative to promoting computing education that is not solely dependent on CSE teaching is empowering other faculties to provide discipline- relevant training themselves. CSE Prof. Mark Guzdial has launched and continued to evolve the Program in Computing for Arts and Sciences over this past year.

- *Goal 7.B: Curriculum structure for CS/CE that offers appropriate undergraduate paths and pedagogy* for: a) majors; b) those who may want certain CS skills but not the major; and c) those who would like to enter the major as enrolled discoverers, external transfers, or participants in specialized bridge programs, such as M-STEM and M-Sci. A number of specific improvements have been implemented:
    - Expanded ULCS courses for majors
    - New transfer student course
    - CSP programming and sections in EECS 203, 280, and 183
    - Foundational Course Initiatives

- *Goal 7.C: Assessment of the structure and functioning of the Master's programs.* A comprehensive review of the master's programs has not yet been completed. However, the Graduate Programs Office and the Associate Chair for Graduate Education have continued to pursue improvements, such as:
    - Greater attention to the need for diversity
    - New mentoring program
    - New coaching program

- *Goal 7.D: Engagement of the whole faculty in understanding and developing programs, curricula, courses, and teaching approaches.* Efforts have continued to assist in providing various avenues for dissemination of information about various course content and didactic strategies:
    - Faculty meeting course spotlights
    - Teaching Lab faculty consultations
    - Textbook Initiative
    - Expanded ULCS course list

- *Goal 7.E: Implementation of a continuous quality improvement process surpassing previous ABET (Accreditation Board for Engineering and Technology) accreditation effectiveness.*
    - CSE has formed the Curriculum Quality Committee and collaborated with CoE/CRLT to complete a new course review process, which is proposed for launch Fall 2024. A companion program review development initiative is anticipated for the near future.

Computer Science Knowledge, Priority 8: **Cultivate leadership, professionalism, and mentoring skills and mindsets through the life cycle of students, staff, and faculty.** Having the resources, skills, and knowledge to succeed requires in

no small part dedication of sufficient support and mentorship of all members of the community. Ways we have been improving in this regard:

- *Goal 8.A: Improved orientation and mentorship programs sustained across time.*
    - Undergraduate mentoring program for students from underrepresented groups
    - RENEW CS mentoring targeting women and nonbinary students: near-peer program for sections of EECS 183, 203, and 280
    - Master's student alumni mentoring program
    - Creation of the junior faculty 1:1 mentoring program
    - EECS 601 coaching and cohort development
    - Creation of an Onboarding Committee

Computer Science Knowledge, Priority 9: **Develop an open and vibrant culture of cross-disciplinary research in CSE.**

- *Goal 9.A: High-impact, interdisciplinary research as a means of keeping U-M CSE at the forefront of computing innovation.*
    - Faculty serving on cross-department teams/committees such as MIDAS and cognitive science executive committee
    - Exploring generative AI in teaching and learning
    - Working with the E-Health and Artificial Intelligence (e-HAIL) and Summer Undergraduate Research in Engineering (SURE) programs

- *Goal 9.B: Increased integration in the doctoral program of research and learning opportunities focused on innovation and boldness.*
    - Expanding focus on broad application of computing across disciplines and world challenges

- *Goal 9.C: A CSE-wide undergraduate research program that engages well-motivated students early in their studies.* Below are examples of recent, new, and ongoing initiatives that provide opportunities for undergraduate research engagement:
    - New Fall 2024 undergraduate research course by Sindhu Kutty, building on previous summer course pilot
    - Explore CS Research
    - Summer Undergraduate Research in Engineering (SURE)
    - Undergraduate Research Opportunity Program (UROP)
    - Faculty sponsorship of independent study projects
    - Professor Mark Brehob maintains a list of ad hoc summer research opportunities
    - Midwest Speech and Language Days

Table of DEI Programs and Initiatives

Undergraduate	Graduate	Faculty	Staff	Student Orgs
Admissions pathways implemented (new enrollment policies)	Rackham Merit Fellowship	STRIDE Workshops	Breakfast Brain Boost	ColorCoded: community, experience, and learning for students from underrepresented populations in CS, CE, and Information
Washtenaw Community College STEM Scholars	CSE Explore Grad Studies	President's Postdoctoral Fellowship Program	DEI trainings	CSEG: Computer Science and Engineering Graduate Students
M-STEM Academies	Building Bridges	CRLT Engineering workshops		
	G/oSTEM, GEECS, and GradSWE	Women in Computing		
	Inclusive teaching training			

Undergraduate Instructional Aide (IA)/Grader Experience

Undergraduate Mentoring Program

CS KickStart

Explore Computer Science Research

Girls Encoded program

Discover Computer Science (EECS 198 now EECS 110)

RENEW CS

Creation of Social Consequences of Computing

Summer Undergraduate Research in Engineering (SURE)

Undergraduate Research Opportunity Program (UROP)

Program in Computing for Arts and Sciences

SSD and ASAP

EECS 601 "Intro to CSE Graduate Research"

Graduate Fellowship Workshops

Conference Sponsorship of Richard Tapia Celebration of Diversity in Computing Conference and the Grace Hopper Celebration

Society of Hispanic Professional Engineers and the National Society of Black Engineers convention

AfroTech

Service Award for Excellence in Diversity, Equity and Inclusion

CSE HACKS Spirit Award

Open House

Grad student coaching

Identifying bias in teaching evaluations

CCE Staff Network, OCCE Faculty Committee, LEAP Alliance

Slack for asst profs

AI Symposium

VoiCSEs: Underrepresented CSE students

ETC: Engineering Teaching Consultant Program

GEECS: Girls in Electrical Engineering and Computer Science

HKN: Eta Kappa Nau, International Honor Society of the Institute of Electrical and Electronics Engineers

KTP: Kappa Theta Pi, Co-Educational Technology Fraternity founded at U-M

NSBE: National Society of Black Engineers

oSTEM/GoSTEM: (Graduates) Out in Science, Technology, Engineering and Mathematics

SHPE: Society of Hispanic Professional Engineers

SWE/GradSWE: Society of Women Engineers

Acknowledgements

This report was prepared by Nikola Banovic, Sarah Snay, Taj Williams, and members of the CSE Diversity, Equity and Inclusion Committee. We are particularly grateful to Donna Bender, Elizabeth Bondi-Kelly, Magda Calvillo, Olivia Callahan, Mahdi Cheraghchi, Steven Crang, Marcus Darden, Meron Demissie, Shelby Eddy, Roya Ensafi, Cindy Estell, Emily France, Jacob Hayward, Rachel Germaine, John Gonzalez, Dhruv Jain, Amir Kamil, Serafina Kamp, Jiachen Liu, Cyrus Omar, JJ Park, Emily Mower Provost, Jasmin Stubblefield, Lisa Villarreal, and Xinyu Wang for providing information, statistics, discussions, and editing.