

**Department of Computer Science
Stony Brook University**

**Strategic Plan for Diversity and Outreach
August 2020**

The Department of Computer Science (CS) at Stony Brook University (SBU) is deeply committed to broadening participation in computing. The department recognizes that among all science and engineering disciplines, the need for inclusion is the most pressing in computer science. Computer science as a discipline has historically suffered from underrepresentation of many demographics. This issue is now coinciding with the increasingly pervasive role of computing in our society and our innovation ecosystem. There is a growing demand for IT specialists at all levels of the workforce. Locally, this demand has translated into tremendous growth in student interest in CS at SBU. Enrollments have doubled in the last 7 years making the CS department one of the largest departments on campus. However, the participation of women and underrepresented minorities in our programs has remained modest at best — either on par or somewhat below the national averages.

Current Efforts

The CS department has taken several initiatives for broadening participation in recent years.

- The department actively participates in and closely collaborates with the WISE (Women in Science and Engineering) honors program on campus in order to attract more women to become CS majors.
- The department partnered with the local non-profit initiative KidOYO, which develops coding infrastructures for beginning coders and provides coding enrichment programs for K-12 students. Selected CS undergrads directly mentor students in KidOYO programs, thus creating a sense of community.
- The department has been organizing a 5-week summer research program for high school students in collaboration with iSTEM since 2017. The program recruits students across the nation, including about 40% female students. It also provides scholarships for students with Federal free or reduced lunch programs.
- The department recently concluded a two-year program with NCWIT's (National Center for Women & Information Technology) Extension Services. This effort was spent on developing a preliminary understanding of the challenges in the recruitment and retention of women in our CS undergraduate programs and mapping the campus-level assets available to us to address these challenges.
- The department is currently implementing a mentorship program funded by NCWIT called MERIT: Mentor, Educate and Retain Women in Information Technology. The program kicked-off in summer 2020 with a two-week coding boot camp and a series of presentations on a variety of topics relevant to academic success.
- The department is in the process of implementing a recently funded program with the *Center for Inclusive Computing* (CIC) of Northeastern University with a specific goal in increasing women undergraduate retention and graduation in CS.

- The department was recently awarded a grant by the University President's office to offer a year-long program of professional development events for female students pursuing IT-related majors. This program will be implemented in collaboration with CEAS and the Career Center.
- In collaboration with humanities faculty, the department has developed a freshman class on digital intelligence (IAE 101) jointly taught by CS and humanities faculty drawing elements from both arts and computing. This course has been wildly successful drawing an enrollment of 500+.
- The department intends to develop an introductory course on data science for non-CS students (tentatively titled "Data Science for All"). An important objective of this course is to expose students who might otherwise not consider majoring in CS to computing-related topics and thereby increase the diversity of the UG student population pursuing computing-oriented majors at SBU.
- The department helped establish WPhD, a student organization for PhD students and researchers in the department. WPhD is meant to foster connections among women PhD students in CS. The department also provides support and faculty leadership to WiCS (Women in Computer Science), an undergraduate club. WiCS has seen amazing growth in recent years.
- Recognizing that a cultural shift is critical, in 2019, the department established a diversity committee with a subset of CS faculty.

Goals and Strategies

The SBU CS department is one of the largest contributors of computing graduates in the tri-state region and within the top 25 nationwide in terms of the number of CS graduates. The department's graduates are recruited by top companies including a fair number going to big tech. The department recognizes its responsibilities in attracting and nurturing a diverse group of students who will contribute to the future workforce of the region and the nation. The department commits towards the following plan for the next 5 years.

Undergraduate students

The department is facing multiple challenges in both the recruitment and retention of women undergraduates. The fraction of women enrolling in the CS undergraduate programs (CSE and ISE combined) is slightly below the national average, at about 19% vs the national average of 20%. The fraction of Black, Latinx and Native American students is about 6% vs the national average of 16%. The department has set a target to increase the fraction of women to 30% within the next 5 years and appreciably improve the fraction of Black and Latinx students. The strategies we will use to address these issues include:

Recruitment

- Work with the college and campus leadership to address budgetary issues detrimental to broadening participation. Budgetary issues have recently limited growth of faculty size and TA pool. This in turn forced the department to limit enrollments by instituting limits on the transfer of students to the CS major from outside of the College of Engineering and Applied Sciences and cutting the number of sections of introductory CS classes.
- Use CS+X-like courses such as IAE 101 to form new pathways for entering the CS major to boost participation and transfer of students from a diverse set of disciplines.

- Improve undergraduate visit days and similar outreach programs for admitted students. Organize additional visit days and outreach specifically for admitted women and minority students in collaboration with specific campus groups, such as WiCS and WISE.
- Expand outreach to local schools going beyond the usual feeder schools by organizing faculty or alumni visits, organizing open houses, etc. Encourage faculty to participate in summer visits of high school students to their labs.

Retention

- Encourage early engagement of CS students in active student groups such as Women in Computer Science (WiCS) and Stony Brook Computing Society (SBCS). The department also provides support to a new students' organization on campus called ColorStack whose mission is to increase retention and success of Black, Latinx, and Native American college students in computing. Providing adequate support to students and helping them create a shared identity can greatly improve retention.
- Identify and remedy leaks in the pipeline in the mandatory part of the CS course sequence. As an example, thanks to the recent CIC grant, we have begun to address the retention problem of women in the first introductory course (CSE101).
- Provide support for commuter students and remove barriers for engagement. Many of our commuter students are women or non-traditional students and they may need specific support for engaging in activities outside of the classroom. They often do not build social networks as easily as resident students. Sometimes they cannot stay on campus long enough for various activities. Examples of possible support include providing curricular support for commuter students: for example, support for doing group projects, providing better work areas and lounge on campus, providing remote office hours and remote mentoring opportunities, and ensuring that campus and departmental events for undergrads are remotely accessible even in the post-covid era.
- Develop and sustain peer mentoring programs and encourage senior women students to become mentors.
- Develop and sustain more interactions between undergraduate and graduate women students in order to foster research activities for undergraduate students. Both WiCS and WPhD groups have already begun hosting events together. Leverage and expand on the thriving VIP (Vertically Integrated Program) for such team formation. Work with WISE honors on their research rotation program to offer it to all CS students beyond WISE.
- In partnership with the Career Center, Alumni Association, and the department's Industrial Advisory Board, hold networking events with alumnae and other industry contacts.

Pedagogy and Teaching

- Institute pedagogical changes to make the introductory CS sequence more accessible and appealing to a diverse body of students. Include more real-world examples and applications that go beyond just computational thinking. Provide more peer programming opportunities.
- Institute a robust process for TA training to make TAs more mindful of inclusiveness.
- Provide teaching mentorship for junior faculty with little or no prior teaching experience. Promote undergraduate teaching as an essential part of career advancement for tenure-track and tenured faculty.

Many of the above strategies may need funding going beyond the regular departmental budget. The department is committed to pursuing federal, state, and foundation level grant programs and partnerships with nonprofits. The department will also engage its alumni network and its industrial advisory board to seek philanthropic opportunities to help in these missions.

Graduate students

In the CS department, the master's and doctoral student populations are overwhelmingly international, about 90% international (vs 65% nationwide per Taulbee Survey) with about 25% women (vs 30% nationwide). Our goal is to increase and retain more domestic graduate students and increase participation of women in our graduate programs closer to the national average. The steps we will take include:

- Overhaul the MS program in CS to make it more inclusive in terms of required undergrad preparation. At this time, the MS admissions require core CS preparation that is hard to achieve without a degree in CS or a closely related area. The department plans to develop a comprehensive set of bridge classes that enables us to recruit from a diverse pool of students from different science and engineering disciplines to the MS in CS program.
- Develop additional graduate programs. The CS department is currently collaborating with the Department of Applied Math and Statistics (AMS) for a new Data Science graduate program to be instituted within the next 2 years. The department will also develop a post-baccalaureate program in CS, taking advantage of bridge courses mentioned earlier. Such a program will be open to students with undergraduate degrees from a diverse set of disciplines.
- Encourage participation in various grant and fellowship programs for eligible domestic graduate students both at the department level and individual student level. The department has recently gotten a Department of Education GAANN award and is also part of an NSF NRT award. We will pursue similar grant development efforts more vigorously.
- Broaden interactions with disciplines such as natural sciences and humanities for graduate studies and research, using IACS and AI Institute as a vehicle.
- Collaborate with the Center of Inclusive Education (CIE) to recruit and retain underrepresented minority students and take advantage of fellowships like Turner.
- Continue recruiting our own CS undergrads for the BS/MS program and encourage them to pursue PhD.

Faculty

The CS department currently has 12% women faculty and no under-represented minority on faculty (vs. national average of 25% women and 5% underrepresented minorities). Our goal is to reach the national average over the next 5 years. The steps we will take include:

- Proactively recruit women and minority candidates for open faculty positions. Explore funding avenues such as SUNY PROiDG for additional faculty support. Make the faculty search process more inclusive. Make all faculty as partners in the efforts to identify strong candidates—with special attention to identifying strong candidates that are women or underrepresented minorities.
- Use departmental and university resources for early-career faculty mentorship. Recognize that career development needs and success pathways of faculty from diverse backgrounds could be different. Support such professional development needs for faculty from diverse backgrounds.