

Departmental BPC Plan
Department of Computer Science
The University of Chicago



Effective dates of Plan: 01/01/2021- 01/01/2023

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Context: Chicago is a minority-majority city and home to the third largest public-school system in the nation (>360k students, 83% Black or Latinx, and 77% lower socioeconomic status). This context provides a tremendous opportunity for expanding engagement with local communities and increasing diversity in CS. Given the state of diversity in CS, small absolute changes will make big impacts; e.g., only 284 AP CS exams were taken by Black students last year in all of Illinois. Currently at UChicago CS, 12% (40) of undergraduate majors and 7% (16) of US graduate students are Black or Latinx. UChicago combined Black and Latinx enrollment is 19% for undergraduates and 10% for US graduate students

BPC Mission: *The University of Chicago Computer Science BPC mission is to foster an inclusive environment where students from all backgrounds can achieve their highest potential.*

We will realize this mission through three data- and evidence-based focus areas that will leverage existing, strategic collaborations:

- I. **Reaching out to Black & Latinx high schoolers to increase CS access and interest** - working with existing college readiness programs (see section I) who have already identified students, registered them with UChicago, and involved their parents
- II. **Creating research and mentoring experiences for undergraduate students from Historically Underrepresented Groups (HUGs)** - expanding existing collaborations with Fisk-Vanderbilt and the Leadership Alliance, taking advantage of support networks and existing expertise in outreach. (HUGs in computing as defined in NSF2110: women, African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders, and persons with disabilities)
- III. **Improving recruitment & retention of graduate students from HUGs of all genders with near-peer & faculty-focused efforts** - leveraging student-based recruitment to create peer-support networks, which research shows is highly impactful in student retention.

For each focus area, our goal is not to start new programs from the ground up, but to expand existing UChicago programs and strategic collaborations to include CS specific curriculum and the appropriate training for CS faculty to be active participants in each effort.

I. Broadening the Pipeline via Sustained Engagement (High School) (R.H. Landsberg)

G1-Goal: Reach over 100 Black and Latinx high schoolers via > 40 hours of enrichment programming that actively involves 50 department members every year to increase their CS engagement.

A1-Activities: The CS department will leverage two established, on-campus, college readiness programs for local high school students: the Collegiate Scholars Program (CSP) and the Office of Special Programs (OSP). These programs reach over 250 underserved students, more than three-quarters of whom are low income, first generation, and Black or Latinx; two-thirds of whom are female. Students in these holistic multi-year programs regularly come to campus throughout high school. The programs are highly successful (e.g. >95% of participants enroll at a university - But less successful in CS - only five of 145 OSP graduates from 2015-2020 indicated they would pursue a CS degree) and provide long-term student tracking to gauge impact. In collaboration with OSP and CSP we will add a *missing* CS component by developing sustained, multi-year engagement opportunities including:

- **A1a** College-readiness seminars (e.g. creating a strong digital identity)
- **A1b** CS career awareness workshops (e.g. via annual OSP career conference)
- **A1c** Special topical, age-appropriate courses (e.g. introduction to machine learning)
- **A1d** Research internships (5-10/yr see section II.).

Metrics:

- Number of department members, students, and parents participating, & contact hours
- Attitudinal indicators: self-efficacy, towards CS & CS careers; and of department members towards the high school students

- Longitudinal student tracking: CS classes & AP exams taken, college majors & degrees

II. Introduction to the Culture of Research (HS/Undergrads +) (David Cash)

G2-Goal: Increase the long-term persistence of HUGs of all genders in computing via immersive internships.

A2-Activities:

- **A2a** Academic year research internships: We will lower barriers for undergraduates via training sessions (e.g. introduction to the research process) and by broadly advertising part-time research opportunities (e.g. to lessen the need to knock on a faculty door).
- **A2b** Summer internships: We will expand, enrich, and leverage our existing cohort-based summer data science research program. Recruitment will be broadened through collaborations with the above-mentioned college-readiness programs, as well as the Leadership Alliance, DREU, and the innovative Fisk-Vanderbilt Master's-to-PhD Bridge Program. A *new*, week-long "on-ramp" session focused on core research skills and community building will provide additional scaffolding for students without a background in computer science and research.

Metrics:

- Numbers of students from HUGs placed in internships & of mentors that underwent training
- Attitudinal indicators: self-efficacy, satisfaction with the experience and mentoring, plans
- Differential numbers on CS persistence and graduate school matriculation

III. Outreach, Recruitment, and Retention (Graduate) (Hank Hoffman)

G3-Goal: Increase the number of graduate students from HUGs of all genders and ensure their success

A3-Activities:

- **A3a** Faculty visits to minority-serving institutions, midwestern and liberal arts colleges.
- **A3b** CS student visits at those institutions, and at diversity-focused conferences, leveraging near-peer recruiting through the Graduate Recruitment initiative Team (G.R.I.T.), a UChicago student group focused on diversifying STEM.
- **A3c** Support these near-peer networks from recruitment through graduation
- **A3d** Expanded collaboration with Discover UChicago, which provides individuals from HUGs an expenses-paid opportunity to explore graduate education at UChicago. We will recruit students to participate in the annual weekend visit and host events in the department for visiting students. In the past few years, only one or two CS students have applied to attend.
- **A3e** Faculty mentorship training to prepare faculty to work with students from diverse backgrounds via the provost's "UChicago Faculty Development Program"
- **A3f** Coordination with the PSD office of Equity, Diversity, and Inclusion (dean level) to create CS-specific retention plans

Metrics:

- Increase in applications by individuals from HUGs of all genders & number of application fee waivers handed out and applied
- Number of CS-interested students who attend Discover UChicago
- Changes in the student population using departmental numbers and CRA Data Buddies
- Number of faculty who complete mentorship training
- Division-wide climate surveys to measure sense of inclusivity and belonging

Summary: Research shows that sustained engagement plus a support network creates real change for increased and meaningful diversity. The proposed high school and research internships follow this model and it is implicit in the graduate student recruiting and retention. The proposed mentor training will reinforce these principles and make the long-term relationships more powerful. By including this plan in their proposals, faculty are agreeing to participate in the outreach efforts and training.