Diversity Statement

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Addressing the underrepresentation of groups such as women, minorities, and people with disabilities in computer science is one of the most challenging and critical problems facing us as a field. Increasing diversity not only makes for a more socially inclusive environment, but also broadens the collective insight of the computing field as a whole.

MY BACKGROUND

I am Hispanic, and have experienced many of the situational factors that commonly arise in many underrepresented groups. Of my close relatives, most do not have a college degree, none have degrees in technical (STEM) fields, and none have Ph.D.s. While my parents encouraged education, they were not familiar with computer science or the workings of the higher education system, thus could not always provide advice, or provided well-meaning advice that was not well informed (e.g., I was always told “all accredited schools are the same, so just pick the cheapest one that you can in order to get the best value”). They also did not understand the purpose of graduate school, or why I would choose to pursue being an academic instead of seeking employment immediately after my bachelor's degree. I attribute my success to their support even when they did not know the best advice, and to the guidance provided by my academic mentors. I look forward to being able to provide similar guidance to others.

SUPPORTING DIVERSE BACKGROUNDS

These issues arise in all underrepresented groups, not just along the lines of racial background [8]. My direct experience with these issues has heavily influenced my mentorship, and has driven me to actively seek out students from underrepresented groups to help ensure they know the options that are open to them, support them if they are interested in new areas, and provide resources and guidance for their next steps, whether they are interested in academia or industry positions. I am fortunate that the University of Rochester’s Computer Science Department was a supportive environment for my efforts in this area. I was able to directly reach out to a wide range of students, and engage a majority of the undergraduate researchers from underrepresented backgrounds. I have advised many female students at the undergraduate and graduate level, as well as African-American undergraduate researchers, and a Hispanic graduate student. This not only benefitted them, but has greatly helped my research.

During my undergraduate studies, I helped a group hold weekly after-school sessions for elementary school students. This program helped them learn programming concepts by creating video game worlds and agents with simple behaviors (e.g., patrolling an area). I was able to work directly with these kids, and was inspired by how excited they were about the creation process. These classes were very diverse in terms of gender and race, and I believe it is critical to encourage students at an early stage, before, as evidence shows, the balance of people from different backgrounds declines (“pipeline shrinkage” [1]).

ACCESSIBILITY

My research itself is another means for me to help encourage diversity. While gender and racial imbalances within Computer Science (and STEM fields as a whole) have increasingly come to
mainstream attention — resulting in a broader discussion of the issues, trends, and possible remedies — the barriers to students with disabilities are often overlooked. For example, studies have shown that students with vision or hearing impairments typically lag behind their hearing and sighted peers [3]. This is particularly true in STEM fields. One major reason for these performance and achievement differences is the limitations of access technologies [7].

**Challenges**
Some of these issues are due to specific shortcomings of existing approaches. For example, deaf or hard of hearing students are typically not able to afford sign language interpretation or captioning services (which can cost hundreds of dollars per hour) for study sessions with peers after class. These accommodations are rarely provided by universities, as in-class captions are, because accommodations for such sessions are not required by law. This means that disability service offices are often not budgeted sufficient funds to provide these services beyond the classroom. My Scribe system tries to reduce this burden and make it easier, faster, and more affordable to provide real-time captions.

On the other hand, many challenges that arise are fundamental issues that go beyond the capabilities of technology alone. For example, deaf and hard of hearing students must visually comprehend both references (e.g., pointing to slides, animations, etc.) and spoken content, which is challenging or even impossible in some situations. These difficulties must be mitigated by access technologies as much as possible, and supplemented by new approaches that view the problem holistically, instead of just addressing the specific sensory deficit (e.g., generating easily reviewable notes and video playback techniques for later review, not just ephemeral real-time captions).

**My Work**
My work not only tries to bridge these gaps, and make it possible for students to come closer to matching the performance of their peers, but also includes students with disabilities in the creation and evaluation process [2,6]. This provides dual benefits as both an educational resource, and a new potential source of solutions to the challenges these students face in their daily lives.

I have worked with visually impaired students, and many deaf or hard of hearing collaborators (including a co-PI), which has helped me deeply understand the issues within these communities. Since 2012, I have been publishing and demo systems at ACM ASSETS, the main research venue for accessibility. In 2014, I won a Best Paper award at the International Web for All (W4A) conference on web accessibility for my work on techniques improving student comprehension when simultaneously tracking visual references and reading captions [4], and won the demo award for Scribe in 2013 [5].

I have further engaged with disability communities by attending local “accessibility meetups” and other events where people come together to discuss current issues. My work in accessibility has also explored how to assist people with cognitive impairments, learning disabilities, depression, and more.

**FUTURE ENGAGEMENT**
I will continue and expand these inclusion efforts in the future, both in my research and broadly in the community. I am excited by the impact that my mentoring, teaching, and outreach can have on diversity as a faculty member.
REFERENCES


