

Diversity Statement: Inclusive Mentoring, Research, and Education

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I firmly believe in increasing the accessibility to CS education and research as early as possible. A diverse pool of CS students and researchers offers new perspectives, technical ideas, and impactful applications, all of which contribute to the accessibility of AI in broader communities. To achieve diversity, equity, and inclusion, I have contributed significantly in 3 directions during my PhD. Firstly, I personally and regularly mentor a diverse group of students both at CMU and broadly across the world so that they are closely guided in their studies and research careers. The second aims to increase participation in CS research by organizing initiatives to support undergrad research and making technical research accessible to the public. Finally, I have worked towards providing broad access to CS education so that students of all backgrounds are able to learn the foundations.

1. Diverse and personalized research mentoring

1.1 Dedicated and personalized mentoring: I have strived to provide personalized and frequent guidance to junior students in CS research and education. Throughout my PhD, I have advised more than 30 students at CMU, with 10 of them belonging to underrepresented groups such as women, African Americans, Muslims, and first generation college students. I work closely with each student to design a holistic research plan, teach them research skills, and encourage their own interests. One exceptional student was Irene Li - as I was explaining my work in modeling human communication, she asked whether AI that only saw certain emotions for certain races or genders could be biased against these groups, a concern rooted in her identity as a woman and her worry from reading research on how word embeddings used in NLP can encode stereotypes such as 'woman' being close to 'homemaker'. These were concerns that I had not fully considered, and we collaborated to come up with a project on mitigating gender and racial biases in sentence-based NLP models that go beyond the word level. Irene's research yielded interesting results regarding the biases encoded in sentences (e.g., '*that's the kind of strength that I want in the man/woman I love!*' encodes different stereotypes based on the gender pronoun). [Our work was accepted at ACL 2020](#) (the top conference in NLP), and I continued to supervise her work on mitigating biases in language models. She received a CRA outstanding undergrad research award and is now an ML engineer at SoundHound studying fairness in speech recognition. Across these 30 students, I have supported their diverse interests from theoretical ML to applications like speech, health, education, and real-world fairness and efficiency concerns. I thoroughly enjoy advising students with diverse backgrounds and do not limit them to a single direction or existing projects.

1.2 Broader mentoring: While it is easy to mentor students at my university, the real impact lies in mentoring students who are not privileged to be at the top institutions. I have advised 15 students from other schools and countries, with most of them traditionally underrepresented in CS. This past summer, I created and taught a week-long course ([day1](#), [day2](#), [day3](#), [day4](#)) on AI at the [African Masters of Machine Intelligence](#) (AMMI) program in Senegal, a program to train the next generation of AI researchers from Africa. Many students expressed excitement to collaborate and I now meet with 7 students weekly to advise their Master's thesis. While I was expecting to provide well-defined projects, I was humbled that they all proposed impactful ideas in order to tackle systematic problems their communities face. One student from Ethiopia, Samuael Adnew, proposed building NLP tools for Amharic, the first language spoken by the indigenous Amhara people and largely ignored by the NLP community. Samuael proposed to combine handwritten and spoken Amharic data to address the limited quantity of Amharic text. Other projects include predicting energy grid usage, crop growth, and sentiment analysis for African speakers and languages. These are applications I did not even know were critical real-world problems. Only by collaborating with diverse communities can we actually build technical solutions that matter, and I am excited to return next summer for AMMI again. As a professor, I will proactively organize diverse research programs so that strong students from across the world can get equal research opportunities.

2. Increasing participation in CS research

2.1 Initiatives to support undergrad research: The impactful outcomes of directed mentoring are only possible if a diverse group of students is able to access these resources. I have strived to increase the participation of undergraduate students in directed research, especially for underrepresented groups. As a member of the [SCS undergraduate research engagement working group](#), I organized research mixers and panels explaining the

research process to undergrads and connecting them to grad student advisors. These efforts serve to increase undergrad research participation at all levels from first-years curious about the process to those who already have some research experience. We also made an effort to find mentors from different research areas to increase the choices available to students. I also serve as a mentor for CMU AI undergrads where I regularly give them advice on AI research opportunities, courses, and internships, and also as a mentor for the [graduate application support program](#), where I personally mentored 3-4 applicants from underrepresented backgrounds each year on their application statements and interviews. These help make the community a more equitable place by providing equal access to AI programs that students in underprivileged communities do not typically have access to.

2.2 Making technical research accessible to the public encourages interest in the field for those from non-traditional backgrounds and reduces the barriers to entry for researchers hoping to join the field. I have led initiatives broadening access to AI research by serving as chief editor of the [CMU Machine Learning blog](#) for 3 years. By soliciting, editing, and publicizing blog posts written by CMU students to the public, our blog has been extremely well-received: each post has received thousands of views, been spotted in Google News, cross-posted on BAIR, Stanford AI, Off the Convex Path, and other blogs, and averages thousands of monthly active readers and growing. Many of the incoming students to SCS also said they were inspired by the blog's quality in making AI more accessible and encouraging young researchers to join the field. One post that readers particularly appreciated was [on helping prospective graduate students navigate the student-advisor matching process](#), which has been viewed over 150,000 times and is regularly shared within CMU and other institutions worldwide during student visit days and at the beginning of Fall semesters. Finally, our team regularly analyzes the distribution of published posts and reaches out to students from departments and research areas that are underrepresented. Many such students were thankful and said this made them more confident in publicizing their work. Most universities do not have such an initiative yet, and I am excited to create such a platform and serve as a faculty advisor to an editorial team.

3. Enabling broader access to CS education

3.1 Expanding where we teach: Education is a right and not a privilege, so I have made dedicated efforts toward broader access to CS education. I have taught [tutorials and workshops](#) at international conferences in ML and AI, guest lectures at CMU and other universities, and at summer schools. These are regularly attended in person and virtually by thousands of participants from across the world. One memorable experience was teaching in the AMMI program. While my initial thought was to go at a slower pace than what I usually teach at CMU, I soon realized that these students were equally bright and asked extremely insightful questions. These students and more around the world are equally prepared and deserving of opportunities typically only available at privileged institutions. Seeing these students show so much excitement and participation really reminded me why I want to be a professor, where I will embrace as many chances to travel, teach, and collaborate as I can.

3.2 Public teaching materials: I have also co-led the revamp and lecturing of the core [Multimodal ML](#) course at CMU and co-created two special topics courses on [Advanced Multimodal ML](#) and [Artificial Social Intelligence](#). Every semester, I have made all [materials](#), [lectures](#), and [readings](#) available online for inclusive access. After each discussion session, I also went the extra mile to make weekly [discussion summaries](#) of the main discussion points and write up a coherent document for students and the public following the class online. I strive to continue these practices as a professor by creating high-quality public course content at the forefront of CS.

Future goals. I believe that diversity is dynamic and we should continuously consider groups that are currently facing systematic barriers to access, including those from conflict-affected regions, have difficult backgrounds due to disabilities, or have to take care of children and other family members. When I become a professor, I aim to create an inclusive and supportive environment in my group, department, and institution. For my group, I will value a broad range of backgrounds, personalities, and perspectives. I will also create a supportive environment through group meetings, outings, and personal support in both research and especially outside of research, making sure students are adequately supported in all aspects of mental and emotional wellness. More broadly, I will actively join existing DEI committees, start new initiatives for broadening access to undergrad research, apply for additional funding through programs like NSF REU and NSF BPC to support participation, make CS more accessible via a department blog, and expand my teaching and mentoring efforts around the world.