

Diversity, Equity and Inclusion (DEI) Statement | Sumon Biswas

By embracing people of diverse cultures, backgrounds and journeys, the societies experience jubilation in many aspects of life, notably within science and discovery. As educators and administrators, it is our responsibility to develop philosophies that are flexible and considerate. I not only support diversity but also enjoy working in an inclusive environment where everyone is safe, has a sense of belonging, and their voices are heard. In my Ph.D. dissertation – *understanding and reasoning fairness in machine learning pipeline*, I discovered how discriminations are ingrained in societal systems. My work on fairness stipulates that discrimination must not happen for any group or individual based on their protected attributes [1], including but not limited to race, ethnicity, sex, age, life experience (e.g., religious belief, relationship status), and any kind of disabilities (e.g., physical, psychological, technological). My research experiences, coupled with my past efforts toward diversity, inspire me further to advance the cause of an inclusive environment in academia.

Broadening Participation Through Advising and Teaching

At CMU and ISU, I mentored **13 students** including women, people of color, undergraduate and early Ph.D. students across different research projects, which resulted in impactful contributions including five top-tier conference publications. An undergraduate student I mentored through **NSF REU** program, later pursued a Ph.D. under my mentorship. I observed that individuals possess different perspectives, communication skills, and cognitive approaches, thereby, I consistently valued their uniqueness. As part of my teaching as a TA in *COMS 308: Software Development*, one of the largest CS courses, I interacted with diverse undergraduate students and supervised **96 students** (8 project teams in each of the three semesters). In weekly meetings with the teams, I always assured that everyone's voice is heard and they get a fair amount of support to complete the task. I frequently found introverted students who do not keep up with their teammates, where I arranged personal feedbacks and pointed out the resources such as anonymous question-answering in Piazza. I was also a TA for *COMS 327: Advanced Programming*, where I affirmed the freedom of expression by avoiding the imposition of certain software, OS platforms, or technical artifacts. In my classrooms (recitation), I enriched participation through a variety of teaching methods and materials including screencast videos, demo source code, presentation slides, etc. My instruction went beyond using preferred pronouns and avoiding offensive humor but also ensured that students are receptive to the references and examples I provided.

Looking ahead, in my research group and classroom, I will strongly encourage participation from wide backgrounds and experiences including international, LGBTQ+, and a broad range of identities [2]. I will ensure equity in instruction through the adoption of best practices, e.g., transparent grading rubrics, student feedbacks, etc. [3]. Within the university and the local community, I will promote training programs and courses centered on DEI. In addition, I will be open to advise beyond my comfort zone to students who are not already familiar with my works. As I realize that the power differential between the faculty and students can create barriers, I will establish an engaging work culture through explicit verbal commitment and written conventions, e.g., statements in syllabi. In the practice of scholarly writing, presentation, and software development, I will strive supporting older adults and people with visual, auditory or other impairments, as I always celebrate their abilities rather than disabilities.

Supportive Environment Through Structural Change

Oddities like the dominance of women in early computer science and their drastic dearth in the recent past are caused by many social structures. I can personally attest to that, as I experienced far less participation of women and students from low-income families in my academic journey. As an international student from Bangladesh, I also recognize the hardship of a student striving academically in an alienated environment. I noticed the *leaky pipeline* in graduate education, as many of my cohorts dropped off for several reasons such as depression and imposter syndrome issues [4]. I co-founded and served on the executive committee of Bangladesh Student Association (**BSA**) at ISU for two years, organized cultural events, and supported prospective students with information about admission, funding opportunities, etc. Outside my graduate school, I benefited significantly from research community structures. For example, I was awarded the **PLMW scholarship** from the Programming Languages Mentoring Workshop, which provided me the exposure to engage with esteemed professors and peers. Later, I served as the **Accessibility Chair** in organizing SPLASH 2020, one of the largest conferences in the area hosting OOPSLA, ECOOP, and other co-located events. Adapting to the challenges during the pandemic, we transitioned SPLASH into a virtual setting, where I facilitated closed captions for all the virtual talks and 12-hour mirroring, to make the conference accessible from all time zones. Followed by the acknowledgment, I served as the Accessibility Chair in SPLASH 2021 as well. This time, I contributed to organizing a **hybrid conference** with more than 300

in-person participants in Chicago and 400 virtual attendees. I observed great positivity in the hybrid mode, which enabled attendance from East Asia, Africa, and Middle East. I further inspired the community to organize such hybrid conferences in the future for the greater cause of inclusivity [5].

In the future, I will continue building academic infrastructures such as peer mentorship program, fellowship application workshops, rising stars program, career talks, etc., for supporting identity groups to succeed in a competitive environment. I am a proponent of creating mental wellness programs and events, such as the “Let’s Talk”, a free drop-in service at CMU offering informal and confidential counseling, which are even more essential in the post-COVID world. I will ensure smooth reporting of egregious issues such as bullying, abuse, or harassment of any sort of my students and co-workers. In academic conferences and workshops, I will actively take leadership to foster the engagement of underrepresented groups in my core research area.

Societal Impact Through Research In Fairness and Ethics

Several discriminatory incidents in societal systems such as college admission, hiring employees, credit approval, etc., inspired me taking on *Fairness* as my Ph.D. research. Through extensive study and evaluation, my research uncovered how ignorance and prejudice cause discrimination systematically against underrepresented people. I developed state-of-the-art methods to identify, mitigate, and verify such **biases in software components** [1]. Given numerous potential applications, my research contributes to the overarching goal of achieving an equitable society. I also showed that data-driven software often reproduces and propagates existing social biases that stem from human decisions. Thus, a thorough understanding of the root causes of bias is needed to address the intricate challenges, e.g., the trade-off between class diversity and academic preparedness of students. Hence, we need further awareness and analytics for fair institutional policies.

Moving forward, I will continue to leave societal impact through my research on ensuring fairness that *sustain in the long-term*. As a faculty member, *first*, I plan to build and actively engage with a DEI evaluation framework using metrics such as Demographic Parity and Equal Opportunity, to inspect the use of any technology in education, e.g., AI models (e.g., ChatGPT) or student portals (e.g., Canvas). *Second*, I will develop data-driven strategies and transparent policies to ensure diversity in student enrollment, class participation, retention, and recruitment.

Advancing Engagement and Collaboration through Outreach

As computing is becoming more relevant to other sciences and interdisciplinary domains, it is our collective responsibility to increase the engagement of people from diverse disciplines and age groups. In 2018, I co-organized the **K-12 Computational Thinking** event at ISU as part of the series of events and workshops designed to engage K-12 students, parents, and educators. I served as the judge of the project demonstration, where K3-12 students developed playful coding solutions using tools such as MIT Scratch, which was an amazing opportunity to encourage youngsters in computational problem-solving. I also served as the Ambassador of the **Women in Data Science** (WiDS) initiative by Stanford. As part of the annual WiDS Worldwide Conference, I co-organized the event at ISU to inspire more women’s participation in data science. At ICSE’23 conference, I was one of the mentors in **Student Mentoring Workshop** (SMeW), which provided guidance and motivation to diverse undergraduate and early graduate students encouraging their pursuit of Ph.D. and research careers.

Looking ahead, to increase diversity in my department and lab, I would reach out to individuals who had little or no access to breadth research opportunities in computer science, e.g., affinity groups mailing lists (BlackInAI, QueerInAI, etc.), specialized conferences (Grace Hopper, Tapia, etc.), and minority-serving institutions. I will support the mobile outreach programs such as TechNights (hands-on training for middle school girls), and CS Roadshow (interactive presentations for K-12 students) held at CMU. Finally, I believe that my teaching philosophies and research experience would help me to grow as an individual and improve socio-cultural engagement in my workplace. I will be a strong proponent of diversification not only in my scholarly activities and administrative decisions but also in my lifelong aspirations and social interactions.

References

- [1] S. Biswas and H. Rajan, “Fairify: Fairness verification of neural networks,” in *ICSE’2023: The 45th International Conference on Software Engineering*, pp. 1546–1558, May 14–May 20 2023.
- [2] D. Franklin, *A practical guide to gender diversity for computer science faculty*. Morgan & Claypool Publishers, 2013.
- [3] J. Anyon, “Social class and the hidden curriculum of work,” *Journal of education*, pp. 67–92, 1980.
- [4] G. P. Chrousos and A. F. A. Mentis, “Imposter syndrome threatens diversity,” *Science*, pp. 749–750, 2020.
- [5] J. Aldrich, S. Biswas, S. Blackburn, B. Chung, Y. Cong, A. Potanin, H. Rajan, and T. Ringer, “Hybrid SPLASH 2021 Retrospective.” <https://blog.sigplan.org/2022/08/25/hybrid-splash-2021-retrospective>.