Diversity Statement

Hangfeng He

I have been devoting myself to promoting the diversity of the community and fostering an inclusive environment for everyone. A good academic community should give everyone, especially those from underrepresented groups, a chance to pursue their research goals. However, the computer science community, or academia at large, is much more homogeneous than the world. A person who walks into a room with a different appearance, background, or opinion might find it not easy to fit in.

We cannot effectively move forward as a field if we do not actively recruit and retain students from a diversity of backgrounds. I was the head teaching assistant for applied machine learning (CIS 419/519), where there are about 150 students from various departments. In the poster session for their final projects, I was amazed by their rich ideas on various interdisciplinary research problems. In addition, I co-advised many undergraduates and master students from distinct backgrounds. Among them, there are 8 international students, 4 women, and 1 student from an underrepresented racial group. One female student and one student with a non-CS background have already moved on to CS PhD programs at Cornell and Penn respectively. I will continue to make a commitment to educating every student that walks into my classroom, regardless of background, especially those who do not fit in the traditional CS "mold".

When I was a junior PhD student, I had been under immense publication pressure for quite a bit of time. Later, every time I talked with anxious junior PhD students, I would use my own experience to relieve them and convince them that it is normal to publish papers late and it is entirely possible to still thrive in graduate school. At the same time, I would suggest setting milestones in their projects, which would accelerate research progress a lot, especially to students working with relatively hands-off advisors. As an international student, I was feeling embarrassed in group meetings in the early years of my PhD, because I couldn't easily join the discussion or express my thoughts due to the language barrier. I want to avoid new students having these feelings as much as possible. In the future, I will actively check in with junior students and international students, and solicit their opinions in group discussions.

It is important but often ignored that we should encourage the diversity of research, including interests, areas, topics, and methods. Deep learning researchers suffered AI winter in the early 1990s, due to the lack of computing power. It is their persistence decades ago that brings current success of deep learning in various domains. This lesson alerts us that we should provide a more encouraging environment, especially for researchers who are working on unpopular problems. Currently, dominant research relies on scaling up existing machine learning methods with regard to the size of models or training data. In contrast, I have been working on moving beyond scale-driven learning to promote research diversity. My recent work on *layer-peeled model* reveals that the classifiers corresponding to minority classes in deep learning models would collapse to a single vector, once the imbalance level is above a certain threshold. This phenomenon fundamentally limits the performance of deep learning models on minority classes, indicating that researchers should give more serious consideration to fairness in deep learning. In addition, much of my past work is based on cross-disciplinary collaborations. I feel very lucky to have worked with people from statistics, linguistics, psychology, and political science. Different insights from each of them have filled different gaps and resulted in key progress in our research, making our papers accessible to a broader audience.