Teaching

Teaching Experience

As a graduate student, I have given guest lectures in both undergraduate and graduate sections of the University of Colorado Boulder algorithms classes on topics including average-case algorithm analysis, ethics of algorithm design, and algorithmic game theory. I additionally co-organized a tutorial on algorithmic fairness in machine learning and mechanism design at the ACM Conference on Economics and Computation in 2021. I also served as a teaching assistant for CSCI 5454 (Graduate Algorithm Design and Analysis) and CSCI 2270 (Data Structures), teaching weekly recitations in the latter and holding weekly office hours for both. Outside of the university setting, I volunteered at a high school STEM camp in Longmont, CO for low-income students, helping them develop meaningful questions to explore research and introducing them to machine learning theory.

Courses of interest

Core courses I am excited to teach undergraduate or graduate courses in the core theory curriculum such as discrete math, probability, algorithms, theory of computation, as well as courses in machine learning or artificial intelligence, algorithmic game theory and mechanism design, and optimization (e.g., convex optimization).

Topics courses Given the opportunity, there are a handful of topics courses I would be ecstatic to teach. As some of these courses are interdisciplinary, I would be excited to co-teach and cross-list these courses outside of the department.

- **Algorithmic Economics and Machine Learning.** This course will cover topics at the intersection of computer science and game theory including information elicitation, equilibrium computation, and online learning. The topics will be similar to Bo Waggoner's course on Algorithmic Game Theory and Raf Frongillo's course on Algorithmic Economics and Machine Learning.
- **Social Implications of Algorithmic Modeling.** This course will review some common modeling assumptions made in computing (e.g., encoding gender and race as binary variables), how they fall short, and how we can mitigate their harms. The topics will be similar to Rediet Abebe's course on Algorithms and Inequality and Casey Fiesler's course on Ethical and Policy Implications for Technology.

Teaching Philosophy

My teaching philosophy centers around creating an inclusive environment where students are encouraged to show up as their authentic selves, deeply understand the foundational concepts guiding the material, and learn how to generalize taught concepts beyond the classroom. As students venture into their careers, they will have to adapt their foundational knowledge to new settings (e.g., different programming languages), and learning only to pass a test will fail them. Instead, I aim to ensure students take away foundational knowledge that generalizes so they know *how to learn* in new settings.

Developing an inclusive classroom culture As an instructor, I know that I play a crucial role for developing the tone and culture of the class over the term; excitement is contagious, and it is easier to be vulnerable and ask questions when you are not afraid of being reprimanded or judged. I plan to build a classroom environment students are encouraged to engage with their curiosity, and this starts with my vulnerability to share my personal struggles learning the material. I know that I might not always have the answer to students' questions, nor do I expect my students to have all the answers to the course material. I aim to encourage communicating the learning and thought process a student goes through in learning a concept by acknowledging and encouraging promising developments and growth, rather than solely praising arrival at the correct answer.

Incentivizing understanding through class structure One of the most valuable lessons I learned in graduate school was to shift my focus from *accomplishing tasks* to *understanding concepts*. My research centers on scoring rule design, and understanding how we measure and score students in the classroom informs us about what they are incentivized to learn. The typical classroom structure incentivizes completing tasks; we tell students to do an assignment for a good grade. Once a grade is assigned, it is immutable, so it better be correct the first time. However, if we change our metric of understanding from task completion to something else, like *mastery of given standards*[1], we better incentivize and reward students to shift their mindset from surviving an assignment to understanding and appreciating the concepts being conveyed in said assignment.

Developing a generalizable toolkit to solve new problems As a teacher, my goal is to help students develop algorithmic tools with a deep enough understanding to know how and when to (and not to) apply them outside of the classroom. Often, I have done this through games and leading classroom discussion through hypotheticals. For example, during a guest lecture in undergraduate algorithms, I had students think about modeling decisions for online dating platforms, such as how to make revenue, how to enable users to input gender, and its consequences for matching potential dates during a session on ethics in algorithms. These hypotheticals serve two purposes: first, to connect algorithms to concrete concepts that might be more accessible to non-traditional students, and second, to incorporate ethics into all facets of my pedagogy.

Advising

Experience

I have had the opportunity to mentor five graduate and one undergraduate student in research. The experiences and lessons that arose with each student is unique; I have learned and adapted my advising to each student's preferences and needs, including changing my communication style, being more flexible for adaptive check-in frequency.

I have also partnered with organizations such as Black in AI, Queer in AI, and Latinx in AI, the ACM EAAMO conference, and the Mechanism Design for Social Good (MD4SG) initiative to mentor current and prospective graduate students on "softer skills" such as scientific writing, searching for graduate positions, and defining their own research problems. In Fall 2022, I co-organized the first iteration of the MD4SG mentorship program to pair mentors and mentees to help mentees develop these softer skills as well.

Advising and Mentoring Philosophy

My advising philosophy is to be, first and foremost, a supporter and advocate for my students and mentees. I have learned the importance of clear and honest communication about a mentee's goals, and plan to regularly check in with mentees about their experience so that I can update my advising style as a mentee's goals, expertise, and style evolve.

In advising and mentoring undergraduate students, my main objective is to facilitate their exploration of research and help them decide whether or not they want to pursue a career in research. I am excited to work alongside students to figure out projects that they are excited about and can feel some sort of achievement in working on, whether or not it produces publishable results. With graduate students, I want to engage and foster their curiosity about the world around them, and will adapt my advising style to be more or less hands-on depending on their needs.

[1] Often implemented through standards-based grading or other unlearning approaches.