

I have enjoyed many opportunities to engage with students in a variety of capacities throughout my career. I have been a teaching assistant for five different courses over six quarters ranging from the introductory undergraduate level to advanced courses in machine learning. As a teaching assistant, I interacted directly with students during office hours, gave lectures in recitation sessions, and assisted with preparing course materials. For my work as a teaching assistant, I received an award for outstanding work given to the top 5% of teaching assistants. I have also had the opportunity to mentor students at a wide range of levels on research projects.

From my experience working with students, I have developed a teaching philosophy focused on encouraging best practices, supporting student-driven work, identifying suitable research problems for all backgrounds, and facilitating constructive bidirectional feedback.

Teaching Experience

My teaching experiences span from foundational to advanced courses. At the introductory level, I was a teaching assistant for a course introducing data structures and basic algorithms. At more advanced levels, I have been a teaching assistant for courses in machine learning, data mining, two quarters of artificial intelligence, and a special topics course in machine learning focused on recommendation systems and the Netflix Challenge¹.

As a teaching assistant for artificial intelligence, I worked with a new assistant professor teaching for the first time. The course had over 100 students enrolled, ranging from upper undergraduates to early graduate students. During this quarter, I had increased responsibilities preparing homework assignments and exam questions, as well as handling course administration and logistics, including setting up the course webpage and managing grading infrastructure. For my work, I received an award for outstanding work as a teaching assistant.

I have also prepared a tutorial for the American Medical Informatics Association on Machine Learning for Medical Imaging for a clinically-oriented audience. The tutorial provided an overview of machine learning and recent research in the area, giving the participants an entry point for computational research.

Mentoring Experience

I have served as a mentor for several students and collaborators on research projects. These students had a variety of backgrounds, including undergraduates and junior PhD students with backgrounds in computer science, electrical engineering, and bioinformatics, clinicians with limited exposure to computational work, and two high school students.

Additionally, I was a teaching assistant for two courses with large project-based components. In each of these courses, I was responsible for mentoring around ten group projects. In the artificial intelligence course, groups selected projects of their choice, and in the recommendation systems course, all groups participated in a re-creation of the Netflix Challenge.

¹https://en.wikipedia.org/wiki/Netflix_Prize

Teaching Philosophy

Encouraging best practices Research is challenging at all levels but is especially challenging for early-stage students. From a technical standpoint, students can struggle with managing messy real-world datasets and understanding nuances regarding data collection, potentially resulting in biases in the resulting model. From a conceptual standpoint, students can sometimes aimlessly run experiments with no clear goal. I consider it vital to guide students toward a comprehensive understanding of good research practices to help avoid common pitfalls.

Supporting student-driven work I have found that students are enthusiastic and driven when working on well-motivated projects. As a result, I see it as my responsibility as a mentor to guide students in exciting directions, while encouraging them to develop the confidence to formulate hypotheses, design methodologies independently, and share in-progress ideas. This approach cultivates a sense of ownership over their work, fostering a deeper understanding of the subject matter, and instilling resilience in the face of challenges. Empowering students to take the lead in their research encourages critical thinking, problem-solving skills, and the ability to navigate the complexities of the research process.

Suitable research problems for all backgrounds I have worked with students across a wide range of experience levels and fields of study. These students offered a wide range of perspectives due to their diverse backgrounds, allowing me to learn to think about the same problem from different lenses. Additionally, the areas of interest vary significantly between these students. From working with these students, I have learned to identify challenging but appropriate problems for their level of expertise and tailor my explanations to their backgrounds. This workflow allows students to continue honing their existing skills while developing skills in areas where they are less experienced.

Constructive bidirectional feedback Research is an iterative and collaborative process, and it is essential to allow students to feel comfortable presenting in-progress work and asking questions. This allows them to receive constructive feedback, giving them a fresh perspective on their work and resulting in a more refined research direction.

Additionally, there may be instances where my explanations are unclear or students have issues with my teaching style. I will strive to create an environment where students feel comfortable bringing up these issues and work to address the issues as quickly as possible.

Courses

My prior teaching experience and area of expertise make me well-suited for teaching courses in machine learning, deep learning, and computer vision at introductory and advanced levels. I am also interested in developing courses on interdisciplinary applications of machine learning in medicine and other areas of science, along with project-driven courses in this area. In addition, I am capable of teaching a wider variety of undergraduate-level courses including programming, probability and statistics, optimization, databases, algorithms, and data structures.