

I am passionate about teaching and mentoring, which I view as a dynamic, two-way learning process. While students gain knowledge from me, teaching is a valuable opportunity to give back the knowledge and revisit the material with fresh eyes and deepen my own understanding. In recent years, I gained valuable experience as a teaching assistant on undergraduate courses. I also had the pleasure to mentor a number of talented and self-motivated junior graduate students. They have solidified my commitment to an academic career and motivated me to begin my journey as a professor.

| TEACHING

Experience My teaching experience is based on being a teaching assistant for two undergraduate courses: Machine Learning and Information Security. These experiences gave me the chance to assist students with assignments, exams, lab sessions and exam review sessions. What I observed is some of the most significant learning barriers stem from a reluctance to ask for help. So I kept taking an active approach, I have conversations with students to clarify homework assignments and ensure no one is left behind. That simple act changed the complexion of his class, turning it into an open environment that was much more conducive to asking questions. I broadened this student-centered approach to the assignments themselves, exhorting students to pull open-ended problems down into their own interests. I believe that the solution is tapping into the students natural curiosity to enable them to become a life-long learner and independent thinker.

In addition to TA duty, I have been involved over the past few years as a guest speaker for first-year Ph. D. student colloquium in our college. The objective of this colloquium is to help the Ph.D get familiar with the landscape of doctoral studies and research workflows. As a guest speaker, I shared my perspective on two key topics: preparing for the Ph.D. qualifying exam and aligning initial research with departmental requirements for the first-year review. My engagement often extended beyond the colloquium, as I have continued to mentor and serve as a resource for several junior Ph.D. students who reached out afterward.

Philosophy My teaching philosophy is centered on the conviction that genuine interest is a student's most effective teacher and their most enduring source of motivation. I believe that when students are intrinsically curious, they move beyond rote memorization and engage with material on a deeper, more critical level. This engagement is the key to transforming complex theories into practical, intuitive knowledge.

To put this philosophy into practice, I couple interest with a strong emphasis on hands-on application, as I believe practice is the most critical pathway to true understanding. My primary role is therefore not merely to transmit information, but to act as a facilitator of discovery. In my machine learning courses, for example, I would connect abstract concepts like neural networks to tangible, real-world applications that students interact with daily, from recommendation systems to image recognition. I would design project-based assignments that encourage students to select datasets and problems aligned with their own passions, be it in finance, biology, or art. By creating an environment that values exploration and student-led inquiry, I aim to provide the tools and guidance for them to answer questions that they find compelling.

My ultimate aspiration is to cultivate independent thinkers who are equipped to tackle unseen challenges. By making interest the compass of our learning journey, I hope to help students develop not only technical proficiency but also a resilient and creative mindset that will empower them throughout their careers.

Potential Course Based on my teaching experience, I am prepared to teach introductory courses on artificial intelligence, data science, mathematical foundation for artificial intelligence (AI), and information security. These courses will include fundamental topics including feature construction, Python programming, and applications. Additionally, my research background equips me to teach advanced courses on machine learning (ML) and optimization. I am particularly enthusiastic about developing a graduate-level course focusing on optimization and advanced algorithm in ML. This new course will cover recent optimization techniques and algorithms, such as the algorithms for language model pretraining and fine-tuning, reinforcement learning algorithms for aligning human feedback, reasoning algorithms for large language models and agents. Students will gain insights into pertinent algorithm design challenges faced by real-world AI models. Furthermore, I am also interested in co-teaching interdisciplinary classes at the intersection of ML and fields such as bioinformatics, medical imaging and psychology.

MENTORSHIP

Experience I have been fortunate to advise several talented and self-motivated junior graduate students¹. My approach to mentorship is grounded in the belief that the ideal research emerges from genuine, shared curiosity. This was powerfully illustrated in a recent collaboration with two junior graduate students. At first, recognizing their strong programming skills, I initially proposed that we build a system-level asynchronous Federated Learning (FL) framework. However, as we began implementation, I observed that they had become deeply intrigued by the instabilities inherent in the training process, independently conducting several insightful ablation studies. Seizing on their emergent passion, I initiated a discussion, and we collectively decided to pivot our focus from a systems-level problem to an algorithmic one: enhancing the stability of asynchronous FL. This new direction, directly fueled by their curiosity, led us to develop a novel and effective algorithm. Our paper has been published at ICLR 2024. This experience reaffirmed my belief that mentorship is not about rigidly adhering to a plan, but about dynamically guiding students, fostering their intellectual journey, and following the most exciting questions together.

Philosophy Just as it is said that ‘There are no two identical leaves in the world’, I believe every student is unique. Therefore, there can be no single golden rule for mentorship. While my approach is always tailored to the individual, I hold that all great mentorship is anchored in a set of fundamental mindsets.

Cultivate an Evolving Curiosity. I believe that curiosity is the compass for a fulfilling research journey, guiding us toward meaningful research questions. In my mentorship, I empower students to follow their intellectual passions and dig deep into the questions that fascinate them most. However, I also emphasize that interests are meant to evolve. I encourage students to cultivate an open mindset, viewing their curiosity not as a fixed point, but as a growing entity that thrives on new connections. By prompting them to venture beyond their comfort zones and synthesize ideas from different domains, I aim to help them build a resilient and adaptable research identity, one that is continuously energized by the ever-expanding landscape of knowledge.

Nurture a Mindset for Growth. Research is an inherently challenging journey, where unexpected results and setbacks are not signs of failure, but crucial opportunities for discovery. Unexpected results often lead to new research questions, some of which are particularly important and valuable. I will always praise a student’s persistent discovery and creative strategies. I will empower students with the resilience to tackle interesting, open-ended problems, viewing every challenge as a stepping stone toward becoming an innovative and independent researcher.

Stop and Smell the Roses. While academic achievements are a key metric in a Ph.D. program, I believe life is more than just work. I strongly encourage my students to explore new things and find joy outside research. It is my firm belief that anyone who’s passionate and curious in life is best able to carry creativity into research. Therefore, as an advisor, I am dedicated to supporting their overall well-being and their growth into happy and well-rounded individuals.

¹I have obtained their consent to include their experiences in my statement.