Teaching Statement

Xi Li

Department of Computer Science and Engineering, The Pennsylvania State University

Email: XiLi@psu.edu | *Phone:* (814) 777-6667 | *Website:* lixi1994.github.io

1 Introduction

Reflecting on my extensive experience as a teaching assistant (TA), I have come to appreciate the profound impact of hands-on, student-centered teaching. This teaching statement shows my journey through these diverse roles, reflecting on how they have shaped my approach to teaching, my educational philosophy, and my aspirations for future teaching endeavors. My experiences across various undergraduate and graduate courses in computer science have not only enhanced my instructional skills but also deeply influenced my teaching philosophy and future plans. My teaching philosophy, rooted in these experiences, emphasizes clarity, application, and real-world relevance. This philosophy extends to my future teaching plans, where I aim to contribute to undergraduate and graduate computer science courses. My future teaching plans include integrating cutting-edge technologies and innovative research works and developing engaging course materials that prepare students for real-world challenges. My goal is to prepare students not just for academic success, but also for the challenges and opportunities in a technology-driven professional world.

2 Teaching Experience

Throughout six semesters as a teaching assistant, I've contributed to various undergraduate and graduate courses in computer science, which has significantly shaped my instructional approach. My responsibilities, primarily including holding office hours and grading, facilitated my direct engagement with students, providing individual support and embracing the diverse educational backgrounds. In the undergraduate course CMPSC465 on Data Structures and Algorithms, I focused on facilitating recitations to clarify complex concepts, striving to make challenging topics more accessible and understandable. My approach was to break down intricate algorithms into simpler components, encouraging students to engage actively with the material. For CMPSC/MATH 451 Numerical Computations and CMPEN/EE 455 Digital Image Processing, my role was more lab-centric, where I enhanced students' practical skills in Matlab programming. These sessions were designed to bridge the gap between theoretical understanding and practical application, providing students with hands-on experience in applying their knowledge. Extending my experience to graduate education in CSE597 Robust and Secure Deep Learning, I led lab sessions focused on PyTorch, conducting hands-on tutorials and experiments. This course, closely tied to our research in adversarial learning, offered students the opportunity to work with state-of-the-art deep learning models, thereby deepening their practical and theoretical understanding of the subject. Through these diverse roles, I have developed a multifaceted understanding of teaching in computer science, balancing between theoretical knowledge and practical skills.

3 Teaching Philosophy

My teaching philosophy is deeply rooted in my experiences as a TA, emphasizing **clarity**, **application**, and **real-world relevance**, with a commitment to **diversity**. I believe in breaking down complex concepts into manageable parts, making them more accessible to students with diverse learning styles. My philosophy revolves around active learning, where students are encouraged to engage with the material, ask questions, and apply their knowledge in practical settings. In my interactions during office hours and grading, I focus on understanding each student's unique challenges and strengths, adapting my teaching methods to meet their individual needs. This personalized approach fosters a more inclusive and supportive learning environment. My experience in lab-centric

courses has reinforced my belief in the importance of practical application. I strive to create lab experiences that not only reinforce theoretical concepts but also provide students with the skills needed to implement these concepts in real-world scenarios. In graduate-level teaching, I incorporate elements of current research, bridging the gap between academia and industry. This approach ensures that students are not only learning current theories and techniques but are also prepared to innovate and contribute to the field after graduation. Overall, my teaching philosophy is centered on creating an engaging, supportive, and practical learning environment that prepares students for both academic and professional success.

4   Future Teaching Plan and Goals

As I look towards the future, my enthusiasm is centered on the opportunity to contribute to undergraduate-level courses for computer science or graduate-level courses in machine learning. Building on my experiences and teaching philosophy, I plan to bring a dynamic and practical approach to these courses, focusing not just on the theoretical aspects but also on hands-on, real-world applications.

Integrating Cutting-Edge Technologies: One of my primary goals is to integrate prevalent technologies such as PyTorch into my teaching methodology. By conducting comprehensive deep learning workshops using PyTorch, I aim to provide students with an immersive experience that reflects current industry standards and practices. These workshops will not only cover the fundamentals of deep learning but also delve into advanced topics, offering students a well-rounded understanding of the field.

Developing Engaging and Practical Course Material: Beyond imparting theoretical knowledge, my ambition is to develop course materials that are intellectually stimulating and practically rewarding. I envision creating a curriculum that balances rigorous academic content with engaging practical exercises. This approach aims to foster not only a deep understanding of machine learning concepts but also a genuine passion for the subject.

Preparing Students for Real-World Challenges: A key aspect of my future teaching plans is to equip students with the practical skills necessary to address real-world challenges. By incorporating project-based learning and case studies drawn from contemporary issues in the field, I intend to prepare students for the complexities and demands of the professional world. This approach will not only enhance their problem-solving and critical-thinking skills but also give them a competitive edge in their future careers.

Future Course Offerings: My teaching plan covers various computer science courses at both undergraduate and graduate levels, based on my extensive experience as a TA. I am capable of instructing from basic programming to core courses such as data structures and algorithms. Additionally, my expertise in machine learning enables me to offer specialized courses in this field and propose new ones focused on adversarial machine learning, aligning with my research and introducing innovative content to the curriculum.

5   Conclusion

In conclusion, my journey in teaching, enriched by diverse teaching experiences and a student-centered philosophy, is leading me towards exciting future prospects in computer science education. The integration of innovative technologies and a focus on practical application are at the core of my future teaching plans. I am dedicated to crafting a curriculum that not only intellectually stimulates and engages students but also prepares them for professional excellence. My goal is to foster a learning environment that goes beyond conventional limits, enabling students to delve into exploration, innovation, and make substantial contributions to computer science. Moving into the next phase of my teaching career, my aim is clear and focused: to equip students not only with knowledge but also to inspire innovation in the field of computer science.