Teaching Statement

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I view teaching as one of the most exciting and meaningful aspects of an academic career. Throughout my academic journey, I have had the privilege of teaching and mentoring students at both the undergraduate and graduate levels. I find this work deeply rewarding because educators play a unique role in shaping students' intellectual growth, career paths, and problem-solving abilities. Looking ahead, I am eager to embrace this responsibility with an aim to inspire curiosity, prepare the next generation of computing professionals, and guide graduate students toward becoming independent, creative researchers.

1 Teaching Experience

I am fortunate to have gained diverse teaching experiences, both through formal academic roles and in a voluntary capacity. I discuss them below.

1.1 Teaching during Master's

My first teaching experiences date back to my time as a Master's student at IIT Kharagpur, where I served as a teaching assistant (TA) for four consecutive semesters. I assisted in the undergraduate-level ***Computer Networks*** course and the graduate-level ***Performance Modeling of Computer Networks*** and ***Smartphone Computing and Applications*** courses. I was selected for these roles after excelling in these or related subjects as a student. My responsibilities included helping design and grade exams and assignments, and offering one-on-one support to students during office hours. I also delivered guest lectures in two of these courses on topics closely related to my research at the time.

1.2 Teaching during Ph.D.

At Princeton, I served as a TA for the undergraduate ***Advanced Programming Techniques*** course for two semesters. Beyond grading and office hours, I mentored student teams on semester-long software engineering projects (four teams each term) that aimed at developing full-stack web applications for real-world use cases such as housing management, beekeeping, dating, and course selection. Each team proposed an idea, gathered requirements, implemented and tested their system, and presented their final product. I guided students through all stages of this process and evaluated their work. All projects were completed successfully, and four were later adopted by the University and made available to the broader Princeton student community. I received highly positive feedback from both my faculty instructor, Dr. Robert Dondero, and the students that I interacted with.

1.3 Voluntary teaching experience

In Fall 2024, I had the unique and deeply rewarding opportunity to serve as an instructor with Princeton's ***Prison Teaching Initiative***. Along with three other instructors, I taught ***Basic Mathematics*** to a cohort of incarcerated students. I developed course materials, delivered lectures, and graded exams and assignments. The lectures were delivered inside the prison premises within the constraints of a high-security environment where no electronic equipment or external resources were permitted. Teaching in this context challenged me to find creative approaches to instruction and foster engagement across diverse student backgrounds, learning abilities, and temperaments. I received highly positive feedback from my students, and this experience strengthened my ability to teach with empathy, adaptability, and patience—qualities that I believe are essential in any classroom.

2 Teaching Philosophy

Through these experiences, I have developed my own teaching approaches, which I plan to continue refining and improving. I would like to highlight three key aspects of my teaching philosophy.

2.1 Create an inclusive environment

I believe that effective learning begins with a safe and inclusive classroom environment—one that accommodates different learning styles, backgrounds, and paces. Every student should feel comfortable asking questions, sharing ideas, and engaging in discussions without fear of judgment. I encourage students to voice their thoughts freely, even when their ideas are not yet fully formed. When questions arise, I work through them collaboratively with the class, using the discussion itself as a learning opportunity to deepen understanding and build confidence.

2.2 Learn by doing

I strongly believe that students learn best by getting their hands dirty, i.e., by working on practical exercises inspired by real-world problems they can relate to. Networking and systems are particularly rich areas for learning by experience, offering countless opportunities to experiment with real systems and technologies in high demand. For instance, using testbeds such as ***CloudLab*** or emulators like ***Mininet***, students can explore the behavior of routing protocols, observe how they operate in realistic environments, and gain hands-on experience configuring routers, firewalls, or deploying services on cloud platforms such as ***Amazon Web Services***. These exercises make abstract concepts concrete while simultaneously building valuable technical skills.

2.3 Inspire and motivate

Finally, I believe it is essential to inspire excitement about computing. For undergraduate students, this means sparking curiosity about the field and showing how computing impacts the world around them. For graduate students, it involves cultivating enthusiasm for research and preparing them for careers as independent scholars. One way in which I want to achieve this, is through class projects, where students apply the concepts learned in class to real-world problems and present their findings at the end of the semester. I believe such projects not only reinforce technical learning but also foster creativity, critical thinking, and communication, which are key ingredients for long-term success in research and industry.

3 Potential Courses

I am qualified and prepared to teach a variety of undergraduate and graduate-level classes in the areas of computer networks and systems. In particular, I am interested in teaching ***Computer Networks***, ***Computer Systems***, and ***Network Security***. Since I am also passionate about programming and have prior experience of being a TA in an advanced programming course, I can teach introductory or advanced programming classes leveraging languages such as C++ or Python or, in general, introductory CS classes. At the graduate level, I am prepared to teach research-oriented seminars around my research interests, such as ***Programmable Networks***, ***Real-Time Applications***, and ***Cloud Computing***. In particular, designing a class around programmable networks, touching on topics like SDN, P4, and programmable data planes, is something that I am interested in. A second class that I would like to teach is on the intersections of multimedia applications and networks, discussing topics such as video streaming, video conferencing, and virtual reality. Finally, I believe we are in an exciting time to better understand the intersections of machine learning and computer networks and there is huge potential for a class on this topic. This includes both using ML to aid in monitoring and controlling networks (e.g., for intrusion detection) and also discussing the impact of networks on ML workloads.

4 Mentorship Experience

I have had the privilege of mentoring several students at both the undergraduate and graduate levels. I have always valued these experiences as opportunities for mutual learning, where both mentor and mentee grow through open exchanges. I view a strong mentor-mentee relationship as one of the foundations of a student's success, and therefore, I take this responsibility seriously.

4.1 Mentorship during Master's

At IIT Kharagpur, I mentored several undergraduate students during their Bachelor's theses, semester-long research projects, and summer internships. Many of these efforts led to tangible research outcomes: one

resulted in a poster at ACM MobiCom, two others won ***Best Poster*** and ***Best Academic Demo*** awards at IEEE/ACM COMSNETS, and another formed the basis of a later publication at IFIP/IEEE IM. I take particular pride in seeing many of these students pursue research careers after graduation.

4.2 Mentorship during Ph.D.

At Princeton, I have had the opportunity to mentor two students—one undergraduate and one graduate. The undergraduate student, Daniel Jubas, completed his senior thesis on detecting BGP interception attacks using round-trip time measurements. His work provided critical insights that shaped our subsequent long paper, which is currently under submission. I also co-mentored Emma Farkash, a graduate student, alongside Oliver Michel. Together, we explored the causes of quality degradation in video conferencing applications, uncovering several promising directions that we continue to investigate further.

5 Mentorship Philosophy

I have been fortunate to work closely with several outstanding academic advisors and mentors throughout my career, each of whom shaped my growth as a researcher and a mentor. Their diverse mentoring styles influenced my own approach, which I have continued to refine over the years and plan to further develop as I advise my own students. I highlight below three key aspects of my mentoring philosophy.

5.1 Learning a broader set of skills through research

Research involves much more than answering a specific question or publishing a paper. While the final outcome is important, the journey toward it—often long and challenging—provides invaluable opportunities for growth. I aim to help my students acquire a broad set of transferable skills that will serve them well both within and beyond academia. For example, learning to prioritize tasks under tight deadlines, cope with setbacks or rejections, and persevere through uncertainty are all essential professional skills. I also treat research software as a vehicle for teaching sound software-engineering practices, such as writing clean and maintainable code, documenting and testing effectively, and using continuous integration and deployment (CI/CD) when appropriate. Finally, I plan to emphasize the importance of clear communication—in both writing and presentations—and encourage students to make writing an integral and continuous part of the research process.

5.2 Providing guidance while fostering independence

I believe one of the key responsibilities of an advisor is to help students identify and pursue problems they are passionate about, while providing guidance and feedback to ensure steady progress toward their broader research goals. I have observed that it is easy for students to become absorbed in details or lose sight of the overarching question. My own advisors helped me enormously in such moments—offering perspective, helping me reframe problems, and guiding me back to the bigger picture—all without limiting my intellectual independence. I strive to emulate this balance: offering constructive feedback, contextual insight, and strategic direction while allowing students the freedom to explore their ideas, make mistakes, and develop as independent researchers.

5.3 Encouraging engagement with and seeking inspiration from industry

Computer networking is an inherently applied field, where many research problems are motivated by real-world systems and where new research often finds rapid adoption in practice. I believe strong connections between academia and industry benefit both sides. I would encourage my students to engage with practitioner communities such as the IETF and to follow technical blogs from organizations like Cloudflare, Netflix, and Meta to stay informed and identify pain points. I would also actively encourage industry internships, which provide exposure to operational challenges, practical constraints, and the real-world impact of research. My own internship experience at Netflix was transformative since it gave me a first-hand understanding of how research can meaningfully influence large-scale systems and improve experiences for millions of users. I hope to provide my students with similarly enriching opportunities that connect their research to the world beyond the lab.