

Teaching Statement

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Over the past decades, computer science has evolved beyond an academic discipline into a powerful force that impacts the society and becomes an integral part of our everyday lives. I love to share my passion, knowledge and experience in computer science with my students and see how they are going to use the principles and tools of computer science to change the world.

Undergraduate teaching: I am a strong advocate of learning by practicing. Computer science is a special discipline where knowledge learned in class can be turned directly into tangible results. I think the best way to inspire students is to let them actually implement something and see how it makes a difference to the world. I have been a teaching assistant for COS 333 Advanced Programming Techniques for two semesters at Princeton. A major part of this course is a team project where three to five students form a team and develop a software product together. As an TA, I have mentored fifteen groups in total. I held weekly meetings with each group, helped them brainstorm ideas and plan their projects, monitored their progress, and provided feedbacks to their accomplishments. I was very proud of the software products they finished, which ranged from an iOS application for location-based anonymous messages to a web site for musicians to share chord sheets. I think such course projects create a unique experience for students where they work together and create software to solve practical problems. No matter what careers students are going to pursue, I believe an emphasis on practice and implementation enhances their understating in computer science and provides them with useful tools to solve a wide variety of problems in their careers.

Graduate teaching: The goal of graduate courses is to offer students the most recent advances in computer science, to engage students in active discussions on timely topics, and to inspire them with new research ideas. I have been a teaching assistant for COS 561 Advanced Computer Networks for one semester at Princeton. In the course, I handled an assignment that asks students to implement a firewall with Software-Defined Networking (SDN). SDN is an emerging technology that fundamentally changes how we design and manage computer networks. I provided a configured virtual machine and code skeleton to students, so they can focus on understating SDN and writing the core logic. In completing this assignment, students learned the key concepts of SDN and obtained hands-on experience with this state-of-the-art technology. In the future, I would like to continue this style of providing course materials on cutting-edge technologies to my students. Furthermore, I found active discussions are extremely important for graduate courses. Many of my own research projects started from reading latest papers and discussing with other students in the graduate courses. I would like to allocate enough time for discussions in graduate courses and encourage students to find interesting ideas to work on.

Courses I can teach: Given my background and expertise, I am qualified to teach networking, distributed systems and operating systems. I am also glad to teach introductory computer science, algorithms and data structures. For advanced and graduate-level courses, I am able to teach advanced computer networks, advanced computer systems, and optimization of communication systems. In addition, I am also interested in teaching graduate-level seminars that discuss emerging research topics in networking and distributed systems, including software-defined networking, data center networks and systems, and analytics and systems for big data.

Graduate research advising: I have mentored two graduate students at Princeton, Jennifer Gossels and Xuan Kelvin Zou. I mentored Jennifer by having her help on my CoVisor project which led to a publication in NSDI. She learned how to develop research ideas, design systems, and write papers though the project. I mentored Kelvin in a video streaming project he led which produced a publication in HotMobile. I guided him on formulating the problem, organizing discussions, and interacting with collaborators from AT&T. Based on my personal experience and mentoring experience, I think a good way to mentor students is to provide different levels of assistance at different stages. Junior students do not have enough research experience. It is important for the advisor to offer them some initial ideas and directions, meet with them frequently to answer their questions and concerns, and work with them together to ensure progress. For senior students, it is better to give them more freedom, so that they can develop their own ideas, find their own interests, and learn how to work independently.

I enjoy collaborations and benefit immensely from my collaborators (at Princeton University, Yale University, University of Pennsylvania, Purdue University, ETH Zurich, Stony Brook University, the Chinese University of Hong Kong, Tsinghua University, Microsoft Research, HP Labs, AT&T Labs, Bell Labs, ON.LAB, Rockley Photonics, etc.). I will introduce my students to my collaborators and encourage them to work with other people and institutions, in the form of summer internships and academic visitors. I hope this would provide them with different experience from working with me, inspire them with new ideas, and get them involved in the research community.