I am excited to train new generations of students about the possibilities that hardware and software enables. My desire to continue teaching and working with students is a key reason why I am pursuing academia. I find teaching and mentoring highly rewarding.

Teaching philosophy

My teaching philosophy is inspired by several outstanding professors I have been fortunate to learn from during my undergraduate and graduate education along with strategies I have acquired in a Science and Engineering Course Design class (ENG 312) at Stanford. My goal as an educator is to teach students how to approach new problems and build the confidence and skills they need to solve them. Through lectures, I distill complex course topics down to the fundamental ideas, draw connections between concepts, and use real life examples to show how what we discuss in class fits into a larger picture. To stimulate lifelong learning, I design assignments that encourage students to build up ideas from basic concepts, rather than motivating students to memorize subject matter. I am an advocate of project-based learning in which students work in teams to solve open-ended challenges with clearly defined objectives, simulating a realistic work scenario. Finally, I embody a growth mindset in my teaching to make students with diverse backgrounds, different levels of prior knowledge, and a wide range of confidence in their abilities feel welcome and supported to succeed in my class.

Teaching experience

My main teaching experience comes from lecturing four classes in a graduate-level computer systems architecture course at Stanford University (EE 282). I designed lecture materials and engaged students during lectures with real-world examples of concepts. For instance, I explained the importance of reducing tail latency for datacenter workloads by considering the steps involved in a Google search query. It was rewarding to see several students linger after class with genuine enthusiasm and curiosity to continue discussions stimulated by the lectures.

I am excited to be co-teaching a computer systems architecture course with John L. Hennessy this winter. With lectures starting in January, we are currently revamping the course syllabus to include recent advances in the field, such as accelerators for machine learning and security considerations for microprocessor design. I am also designing assignments for students to apply their knowledge through software and hardware design space exploration.

My other teaching experience includes mentoring students for course projects and guest lecturing for a seminar class. I guided five graduate student teams to define their course project scope, set milestones, and implement their research proposals for an advanced multi-core computer architecture course at Stanford (CS 316). I was also invited to give a guest lecture for a storage system seminar class at UC Santa Cruz. I presented an overview of Flash technology to give students intuition about the unique characteristics of the hardware and led a discussion about the challenges that software systems need to overcome to achieve predictable performance on Flash.
Interests

As a new faculty member, I would be qualified and enthusiastic to teach courses in operating systems, computer architecture, cloud computing, computer hardware, and introductory computer programming. With my research specialization in computer systems and my background in computer architecture and hardware, I have a full-stack perspective that is valuable for teaching these subjects.

I am also interested in developing a new graduate level course at the intersection of computer systems and machine learning. My vision for this course is to bring together students from machine learning and computer systems backgrounds to collaborate on research projects. Students would either apply machine learning to improve the design of computer systems or implement computer systems to address the needs of machine learning applications. To equip students to tackle these research challenges, lectures would cover fundamental concepts and discuss a variety of research papers. I have already designed a detailed syllabus for the proposed course, as part of the Science and Engineering Course Design class I am taking at Stanford this fall.

Mentoring

For me, working closely with students is one the most exciting and rewarding aspects of academia. As a mentor, I encourage students to be independent and creative in their work while providing guidance to spur critical thinking and to ensure that students pursue a fruitful research direction. I have found that some of the most useful guidance I have gotten throughout my Ph.D. has been in the form of questions (not answers) that have pushed me to think about a problem in new ways and find my own solutions. I strive to provide this kind of guidance to my students. While I plan to propose research projects to junior students, I consider myself successful when students become capable of proposing and shaping their own research directions, under my guidance.

During my Ph.D., I have been fortunate to mentor several graduate and undergraduate students, including Yawen Wang, Tushar Swamy, Joaquin Borggio, and Conrad Edwards. When Yawen started her Ph.D., I was working on a cloud storage system for analytics applications. I worked with Yawen to define subsets of the project that aligned with her interests and made sure she understood how her work fit in the bigger scope of the project. We co-authored papers at ATC’18 and OSDI’18 together and open sourced the Pocket storage system. Tushar, Joaquin, and Conrad worked on various extensions to another storage system I was working on. I helped them navigate through low-level operating system code and demonstrated debugging strategies, such as finding the simplest scenario that produces the error. Although these students did not have much prior experience in computer systems, they all succeeded in their projects and their code was integrated into the open source system.

I have also been a mentor to young women in electrical engineering at Stanford. As a board member of the Women in Electrical Engineering (WEE) group for five consecutive years, I have organized dozens of community building activities for graduate students, met one on one with first year students as part of the Big Sister/Little Sister mentoring program, and planned events with undergraduate groups to attract more women to engineering. As a faculty member, I will continue building a welcoming and supportive community for women in electrical engineering and computer science.