

Teaching Statement

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Teaching is as an important pillar of my future career as is research. As a system researcher, my teaching focus is to bridge the gap between theory and practice for students in the area of computer systems. I also focus on improving diversity, equity and inclusion of my research group and encourage students with different backgrounds to actively participate in research activities.

Teaching Philosophy. I have several major goals for teaching. (1) Because programmers and researchers usually need interdisciplinary knowledge to solve real problems, I often encourage students to take a broad look at all computer science disciplines, including math, machine learning, computer systems and architecture, *etc.* Such broad knowledge will be crucial for creative thinking. (2) Teamwork is always important in research and work. Therefore, I encourage students to collaborate with others in their projects. (3) As the concepts and principles taught at courses are usually disconnected, I encourage students to actively apply what they learn from books in practical projects. (4) I encourage students to independently identify research ideas and assess their novelty to develop their research tastes.

Computer system is a broad area with multiple sub-disciplines, including compiler, operating system, distributed system, architecture, *etc.* Solving a system problem often requires students to combine knowledge from a range of disciplines. For example, analyzing and understanding the performance bottleneck in the swap system requires deep understanding of multiple OS components, *e.g.*, paging system, privilege system, interrupt handling, and block system, as well as specific hardware characteristics, *e.g.*, the performance difference between sequential access and random access of tradition block devices and emerging devices, such as non-volatile memory or RDMA-enabled remote memory. To profile a piece of code, students must understand how to use cycle-level high-precision observation methods and the observing effects to the results. Students must gain such knowledge through hands-on experiments. I plan to create such opportunities to attract early-stage students to system projects.

Teaching and Mentoring Experiences. I have much experience in teaching both undergraduate and graduate courses. During my graduate studies, I served a few times as a teaching assistant for an undergraduate compiler course. I led discussion sessions, online Q&A forums, and graded exams.

While a PostDoc at UCLA, I mentored one undergraduate, one master student, and three Ph.D. students. Four of them worked on big data system, and the other two on runtime system. A system project is often extremely intimidating and challenging for junior students, requiring a great deal of patience and time to read the (large) codebase and understand the problem before being able to propose a reasonable solution. I brainstormed ideas with these students on a daily basis and pointed out relevant papers for them to read. I also sat side by side with them to code and debug. Under my mentoring, these students all made good research progress *e.g.*, Haoran Ma and Shi Liu published a paper in OSDI'20 and just submitted two new papers to PLDI'22 and OSDI'22, respectively; Yifan Qiao submitted a paper to NSDI'22 and is currently working on a new NSDI'23 submission. Danqi Hu published a paper in the Journal of Supercomputing, as the first author.

Teaching Plans. I can teach a wide range of undergraduate courses in the areas of programming languages, compiler, operating system and distributed systems. For graduate courses, I can teach advanced operating system, advanced cloud systems, and seminars on architecture and compiler. In addition, I am interested in developing new courses at the intersection of programming languages and operating system for the cloud. As cloud applications are becoming increasingly diverse, cross-layer and semantics-aware optimizations are of paramount importance. As a result, teaching students to consider multiple layers of information when designing a cloud system is necessary in modern computing.

Equity, Diversity and Inclusion. Students in our lab have diverse backgrounds: they came from different countries, *e.g.*, Canada, China, India, Pakistan, USA and Vietnam. Due to their differences in gender, religion, and tradition, they often encounter challenges that distract them from learning and research. I spent much time with junior students to help them with both research and daily life. In my experience, although our lab is a big family and we are always willing to help each other, some students still find it hard to communicate with others due to cultural differences. I also find that female students, especially those in underrepresented racial and ethnic groups, are less likely to talk about their problems, *e.g.*, financial and research concerns. These hidden problems and interpersonal conflicts among students from different cultural backgrounds, genders and races, can cause negative effects on our interpersonal connection and research projects.

Students need more time and care to adapt themselves to the host culture. As they already spend most of their energy and time on challenging research, as their advisor, I will try my best to create a comfortable

and inclusive environment for everyone, especially those in minority groups. In particular, I would like to host more non-academic group talks or group dinners to let students share their stories from different cultural backgrounds. Being aware of each other's differences is the first step to mutual understanding and respect. As an educator, I would also like to work closely with minority students, listen to their thoughts, opinions, and help them solve problems they encounter in both their research and daily life, such as lack of research ideas, financial support, communication problem, *etc.* In short, I will strive to make a difference in ensuring that everyone is respected and has equal opportunities despite race, religion, gender and cultural differences. I am happy to motivate and help all students achieve their academic and life goals.