Hui Lu

Teaching Statement

During the course of my education, I have been inspired by numerous teachers and advisors who make me believe that, an important career achievement in academia comes from teaching and mentoring. As a professor, I will have the privilege to pass on knowledge and experience to future-generation students, as well as the honor to help set the career stages of future computer professionals.

Teaching Philosophy and Experience.

I am a firm believer of learning by motivation — a student’s motivation to learn is vital to mastering new concepts and skills, while a teacher’s main duty is to create a stimulating environment to inspire such motivation. Unlike many other theoretical disciplines, computer science, especially computer systems, reflects a combination of science, practice, and even art. To create a motivating learning environment for computer systems, I believe one of the most effective ways is to design courses where students can involve in building realistic systems and working on practical, relatable problems. For undergraduate students, the practical, interesting implementations will keep them engaged and push them to master basic algorithms, abstractions, and key components in modern computer systems. For graduate students, more in-depth projects focusing on state-of-the-art research problems will allow them to raise questions about existing approaches and move beyond state-of-the-art solutions.

During my Ph.D. study, I have served as a guest lecturer of the operating system course at Purdue University. My duties included converting research results and artifacts into course materials and presenting them during lectures. From this experience, I found that providing intuitive illustration of key concepts and mechanisms is highly effective in keeping students engaged. Some students approached me after class telling me that they were able to quickly understand the topics with the help of my demos and examples. I also encouraged students to raise questions and participate in discussions during class. The questions and discussions provided valuable feedbacks to measure the students’ understanding of the concepts, and to adjust my pace of teaching.

I am well-prepared to teach a number of core courses in computer science. Specifically, for undergraduate courses, I am interested in teaching operating systems, system programming, computer networks, and data structures and algorithms. At graduate level, I am interested in teaching advanced courses in operating systems, system virtualization, distributed systems, and networking. In addition, I am very interested in developing a course on data storage systems, which will involve basic and cutting-edge storage technologies. I believe that an advanced curriculum in systems would allow students to obtain technical skills that are sought after by both industry and academia. I am also interested in developing and teaching special-topic courses on other cloud computing topics, such as software-defined networking (SDN) and cloud resource provisioning and accounting. As a researcher in this field, I am committed to exposing the latest challenges and solutions to my students.

Mentoring Experience.

My commitment to education is also reflected by my mentoring experience. While a research engineer at Intel, I mentored two master students as my interns. My role included designing intern projects, making them familiar with related background, and helping them solve design and engineering problems. Under my guidance, they developed an integrated cloud infrastructure monitoring system, which was successfully deployed in my lab at Intel. In addition, I was fortunate to work in an advisory role with two of my junior colleagues, solving their technical problems and providing career development advice. More recently, as an research intern at Microsoft Research, I worked closely with two production team partners for technology transfer (from research to product), which has helped their downstream development of real systems.

From such experience, I have learned that one’s motivation and methodology plays an important role in his/her study and research, and is the key to a successful career. Bearing this in mind, I will give graduate students a full view of system research methodology by first walking through key steps with them, such as research problem identification, related work survey, conceptual design, detailed design and implementation, and system evaluation. They are then ready to execute a research project more independently. I will train my students in research paper/report preparation via a similar “learn-by-example” approach. During graduate and undergraduate student mentoring, instead of giving direct answers to their questions, I would guide the students to finding their own answers and justification/validation. For students with interest in advanced research, I will encourage them to find interesting angles in research projects, and drive seemingly “crazy ideas” to concrete results — no matter they are positive or negative. Finally, I will encourage students to explore new technical challenges and opportunities outside their “comfort zones” (i.e., areas/topics they are familiar with), which I believe will benefit their long-term careers and help advance relevant technical fields.