Yue Cheng   Teaching Statement

I am fascinated by learning: driven by intellectual curiosity and quest for marketable skills, students explore and discover new things, identifying conceptual challenges and solving real-life problems. The role of a teacher is that of a helping hand, a guide, which helps students achieve their individual learning objectives. In many respects, the opportunity to function in this capacity is what drives me to pursue an academic career. During graduate school, I have had the opportunity to tutor and teach undergraduate students in multiple Computer Science courses as well as mentor graduate students on various research projects, and I have found the experience quite fulfilling.

Teaching Philosophy   I consider teaching as a service and a means to personally grow as a researcher, and a mentor. My 7 years of teaching experience have helped form my teaching philosophy. I believe it is important to inspire students' curiosity in learning abstract concepts and techniques through an example-driven method. For instance, to explain the application scenario of a distributed storage system and how it fits in the application stack from a user point of view, I used an example of how a Facebook webpage click can be transformed into a fan-out of backend store queries that are sent out from the infrastructure frontend web servers to a cluster of backend storage servers. I find concrete examples like this can effectively deliver knowledge in a way that is closely related to our daily life. Hence, students really understand the "why" rather than through rote learning. In addition, I believe that experiential learning is effective in helping students overcome the learning curve and grasp knowledge and skills. And this is especially important in teaching computer systems courses. Hence, I will design courses to 1) instill abstract concepts and technical knowledge through a "think outside-the-box" approach, 2) provide hands-on "hacking under-the-hood" practices, and 3) bring my research ideas as effective teaching tools, to enhance the teaching experience for students. I will also pursue REU findings associated with my research grants to actively engage undergraduate students in my research.

Teaching Experience   At UTSA and VT, I have assisted teaching in multiple Computer Science courses at both the introductory level (CS2073@UTSA: C Programming, CS2505@VT: Computer Organization I, CS2506@VT: Computer Organization II, CS3114@VT: Data Structures and Algorithms, CS3773@UTSA: Operating Systems) and advanced level (CS5504@VT: Computer Architecture). My responsibilities include giving lectures, leading discussion and lab sessions, holding office hours, grading homework, projects, and exams, and designing exams and course projects. This provides me with a great opportunity to closely interact with students with diverse backgrounds and knowledge levels, and also helps me cultivate and enhance my teaching ability. The most rewarding moment comes when I see my teaching really helps students gain a deeper understanding of obscure concepts such as "referencing and dereferencing", and improve on their programming skills. I received very positive feedback from students and instructors. As a result, I was **awarded the 2014 Pratt Fellowship** in recognition of my service to the teaching mission of CS@VT as a teaching assistant over several semesters.

Mentoring Experience   Following the example set by my advisor, my graduate career has been marked by an unequivocal commitment to collaborative mentorship. I have been fortunate to advise a number of graduate students (8 Master students and 2 junior Ph.D. students) on research and course projects. The first two Master student worked with me on a research project, where they built the network optimization module of a complicated distributed storage system prototype. Many of the skills they learned during this project have been indispensable for them to build up their career (one currently working in a startup, while the other decided to pursue a Ph.D. in our department). More recently, I mentor a group of 6 master students on two Operating Systems course projects (spin-offs from my research). I design the high-level projects and have one-on-one meetings with them on a regular basis. These 6 students come from 3 different departments (CS, ECE, and Physics). For students who are new and inexperienced to the field of systems, I first lead them to grasp the entry-level background by assessing their existing technical skills and guiding them to perform hands-on motivational study. For relatively experienced students, I give high-level guidance that leads to broader space for them to explore. I give students real ownership of the projects by having them fully understand why it is crucial to tackle the problems (**the motivation**). I encourage them to thoroughly survey and critically appraise the state-of-the-art (**how others attempted to solve the problems**). I also cultivate their innovation ability on how the problems can be solved in different ways (**imagination is key**). These collaborations turn out to be productive, and some of them lead to publications at top venues such as HPDC, HotCloud, and HotStorage.

Teaching Interests   I feel qualified to teach core Computer Science & Engineering courses (such as Operating Systems, Networking, and Computer Architecture) at both undergraduate and graduate level. I am also enthusiastic about designing and developing graduate-level seminars and advanced topical courses on areas such as Distributed and Storage Systems, Cloud Computing, and the emerging Internet of Things.