

Teaching Statement

“Give a man a fish and he will eat for a day. Teach him how to fish and he will eat for a lifetime.”

– Chinese Proverb

I believe education has two inseparable aspects. One is teaching and the other is learning. A great teacher should not be simply a good feeding machine providing digested material to the students. It is true that with this type of teaching, students can assimilate what is contained in a course syllabus with less effort. However, they will be ill-equipped once they leave the classroom and go into the real world where they will be faced with challenges such as lack of clear problem definition etc. Instead, a greater teacher should be a great inspirer and guide who stimulates interest and the desire to learn from the students, and steers them towards the right directions. “Teach to learn” is my central teaching philosophy.

My past teaching mainly consists of experiences as teaching assistant at Beijing University of Aeronautics and Astronautics (BUAA) and UC Berkeley, and mentor for undergraduate researchers (at Berkeley). In BUAA, I taught programming languages (C and FORTRAN) and basic algorithm courses to non-CS majors. At Berkeley, I TAed Operating Systems. All are senior-level courses. At both schools, my responsibilities include designing and leading discussion sessions, holding regular office hours, giving lectures occasionally, and designing/grading lab assignments and exams. For the Berkeley Operating Systems class, we had 4 programming projects, each implementing a component of an operating system (e.g. virtual memory, networking etc). These were non-trivial projects involving careful design and heavy programming. For each project, I had additional design review sessions (typically 40 minutes long) individually with each project group (3 to 5 students) before they start coding. The purpose of such reviews was to emphasize the importance of a good design and make sure that the students were on the right track. I found that they also served as good opportunities for me to obtain feedback about the students understanding of the course material because by observing how they attacked the problem, I could see how well they grasped the concepts and mastered the skills. I could then adjust my teaching accordingly. I found this quite effective and my students really liked it.

In addition, I mentored several undergraduate students conducting research in my group, including a SUPERB-IT (Summer Undergraduate Program in Engineering Research at Berkeley Information Technology) student from Cornell University (summer 2005). I was responsible for teaching them basic concepts in my subfield and supervising their research afterwards. I enjoyed working with them tremendously, for seeing them become more and more interested in computer science research and make progress towards a mature researcher is an extremely rewarding experience.

All these experiences gave me the opportunities to interact with students both in big classes and individually. They also allowed me put my “teach to learn” philosophy into practice. For example, I always encourage questions and discussions from students. When students ask me a question, I try not to answer it directly. Instead, I try to guide their thoughts toward the correct direction and allow them to arrive at the answer themselves. I developed a few techniques that I found very effective. One is to rephrase or transform the question so that the students can look at it from a different perspective. This often allows them to see the points they miss, better understand the problem and produce the solution themselves. Another is to enumerate possible answers and let the students come up with sensible metrics so that they can evaluate these candidates themselves. Oftentimes, especially in the operating system class and in my

mentoring of undergraduate research, there is not a single correct answer. And my way of handling the questions often causes heated discussion among the students, which is something I am happy to see since it indicates that they are actively engaged in the learning process, and makes them realize that many issues involve tradeoff, a point I want them to take away from the a system class.

I having been a student for most of my life, and have seen two different education systems (those of China and US). The Chinese system, originated from an oriental culture, emphasizes discipline, self-learning and rigorous foundation-building. The US system, on the other hand, grants students more freedom and allows them to pursue their individual interest. I believe both have their virtues. The key is to find a balance. I strive to learn from my own experience, and that of the great teachers I have seen, and provide my students with the best of the two approaches. In my future teaching, I will stress the importance of solid foundation while encouraging students to ask questions and think beyond the course syllabus, engaging them in an active discussion to inspire their interest. I believe research is an essential part of teaching, especially for graduate level classes. The ability to discover, formalize and solve problems is crucial for the students' future careers and good teaching should foster such capability. Relating a course project to one's research areas is an effective way to achieve this. I myself benefited greatly from applying what I learned in class to solving real research problems (several of my courses projects lead to publications) and I will encourage my students to do the same.

Based on my background and experiences, the courses I would like to teach include operating systems, security and cryptography, at both graduate and undergraduate levels. Of course I am happy to take on new challenges. To be a good teacher, one must be a good scholar first. "To give a drop, you must have a bucket." A solid foundation in the subject is the basis for great teaching. I believe my training and hard work at Berkeley provided me with fairly good background. However, I will never be satisfied with what I have and will always try to improve myself, through research and learning, so that I could be best prepared for my students. I will also try to incorporate the above philosophy into my future teaching. It is my firm belief that teaching is the most noble career and I will pursue it with all my heart.