# Teaching Statement for Xiaowei Yang

On the first day I walked into my advisor David Clark's office, he asked me what I planned to do after I graduated, as my career goals would to some extent determine the kind of guidance he gave me. I told him I wanted to be a professor. My deep desire to teach has taken root from the joy I have always gained from learning, the desire to share that joy with others, and the desire to help others overcome the difficulties they encounter in their own educational paths. I recall that I played the role of a tutor for my younger brother ever since he started school. He would come to me with his questions, and during school vacations, I would teach him advanced materials I learned at school and considered cool and exciting. It is a great pleasure for me to see that he also became an avid learner and has been successful in his own academic pursuits. Throughout my high school years and in my freshmen year, I tutored several students who had difficulty keeping up with their classes. At college, my dorm room was the unofficial TA office.

I truly enjoyed these experiences, and found that the formulation of a clear and concise explanation for others often deepened my own understanding. These experiences also made me realize that having a crystal clear understanding is not enough for a good teacher. A teacher must also be able to listen patiently, to see things from the student's perspective, and to understand quickly what makes a student confused and stuck. I found that once I located what blocked a student's thinking thread, often a few sentences would turn a puzzled face into a smile.

At graduate school, I had the opportunity to become a teaching assistant for Prof. Hari Balakrishnan's computer networks class. I gained a full range of teaching experience that included giving tutorials and lectures in front of ninety students, developing course materials, motivating and supporting students on research projects, and grading students' work. From each of these experiences, I have become a better teacher. I realized that when teaching in a large classroom where interactions with students are limited, the most important thing is to motivate and to inspire the students. A teacher has to show her own enthusiasm about the subject. A dry voice will surely put students to sleep. It is also important for a teacher to make difficult things easy to understand by using simple, interesting, and concrete examples. When I taught the lecture on "Application Level Framing," a rather difficult concept for senior undergraduates and first year graduate students, I compared the Application Level Framing approach with the byte streaming approach by using an example of downloading a picture. Students told me that they completely understood the idea once I put up the example.

I believe that hands-on exercises and class projects are essential for system classes in computer science. They help the students to learn and as a consequence, motivate them to learn more. I designed *ns* (a network simulator) exercises for the course I TAed. By doing these exercises, students would observe the behaviors of the TCP congestion control algorithm and various queue management schemes. From the work they turned in, I could see that the students were very interested in doing the exercises, and that the exercises helped them understand the abstract concepts better. Class projects give students the opportunity to apply and to extend the methodologies they have learned from a class to solve open-ended research problems. Class presentation days are when it all comes together. Nothing is more gratifying than seeing students present their own creative work. I was happy to see that several students in my class turned their projects into their Master's theses or research papers.

As my own research interests range from system design to analytical modeling, at the undergraduate level I am interested in teaching both experimental courses such as computer networks and operating systems and theoretical courses such as mathematics for computer science and algorithms. At the graduate level, I am particularly interested in teaching classes in my expertise area, such as computer networks, distributed algorithms, and distributed systems. I also want to teach a seminar that covers the most frequently encountered theories and techniques in networking research.

Another role of a professor is that of research advisor. I believe that the task of an advisor is to make our students our peers. Exposing students to interesting problems is important and a critical prelude to enabling students to explore and define their own problems. Encouraging collaboration among students is important as well as minimizing overlap between their projects so that everyone has the opportunity to do a good thesis. Students have different backgrounds and different personalities. Some students may need more guidance and need to meet with their advisors regularly; some students may be able to do well on their own

and prefer to show up in their advisors' offices only when they are stuck. I plan to be a flexible advisor and give students the type of advising they need. Finally, from my own experience, I am aware of the fact that women or minority students often have a more difficult time at graduate school because of the lack of role models. I remember the occasional self-doubt, wondering "Is this the right career for me?" I am fortunate enough to always have Karen Sollins and Lixia Zhang to reach for. I hope that I'll have the opportunities to do for others what they did for me. I truly look forward to establishing my own research group and to teaching classes.