Teaching Statement

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I consider teaching as a serious responsibility, and I am looking forward to it. My perspective on teaching is developed in my childhood by my mother (a middle school math teacher), and my experience both in college and graduate schools. There is a famous Chinese proverb: “Give a man a fish, and you feed him for a day; teach a man to fish, and you feed him for a lifetime.” My ultimate goal of teaching students is to help them to learn the skills they need to maximize their personal potential. My teaching philosophy can be demonstrated in terms of my experience: 1) to engage students in classroom, 2) to consider students’ various backgrounds, 3) to promote students’ interests beyond classroom, and 4) to encourage and mentor students for success in their pursuits.

Engaging Students in Classroom. I believe engaging students in an interactive learning environment is the key to help students understand and retain knowledge. I design and develop courses (including lectures and discussions) carefully in a creative way. For instance, I put particular emphasis on student engagement when I previously taught “E-Commerce Security and Privacy” course. Instead of using the textbook examples, I introduced and explained the content using the latest real-world examples. When explaining Distributed Denial of Service (D-Dos) attacks, I first presented Georgian bloggers “Cyxymu” attack, which was the most destructive hacker attack in 2009. Then, I discussed how these attacks were started and how to prevent them. I found that explaining the relationship between class topics and real world problems helps motivate students to understand the lectures and thus retain the knowledge.

Considering Students’ Various Backgrounds. As students in a class may come from different departments and schools, when designing and preparing lectures and homework, it is important to consider students’ potential various backgrounds. For example, when I taught the “Introduction to Linux” course, I designed a questionnaire to gather students’ diverse backgrounds and interests before my class began. In the first lecture, I asked students to fill in their questionnaires and submit them to me. When designing lectures, I used these survey evaluations to learn what they already knew about a topic and to get them primed for the material I was going to present. Knowing what already interested them about a topic helped me hit the essential points they may already have been aware of, as well as better integrate the new information into what they already knew. I also assigned students into homework groups by considering their level of computer science necessary skills. This way allowed students to learn the skills and knowledge that are not covered in the lectures from their team members.

Promoting Students’ Interests Beyond Classroom. There is always a limit to how much students can learn from the lectures in a class. Therefore, I believe another way to encourage students is to provide interesting hands-on projects beyond classroom. I found this is the most effective way to help students understand and apply the concepts from lectures. For example, to helping students understand networking protocols, I designed a hands-on project to implement a simple instant messaging software. I found that after implementing this project, students understood well the difference between TCP, UDP and FTP, and when to use them. I also encouraged students to think more about the projects that they have done. For instance, “Is it possible to add any more useful services in the system based on the concepts and ideas from lectures?” By doing this, students revisited and utilized the knowledge and skills learned in class. One of six lab groups ultimately made a campus scale online office managing system that provides services such as chatting, sending/receiving files, online quizzes, and file management (e.g., statistical checking size, type, date), etc. As shown in these examples, the hands-on projects outside of the classroom provide students more opportunities to learn the experience about how to build real computer systems and how to apply concepts from the classroom to resolve real world problems.

Mentoring Students. Perhaps, the most important role of teaching is mentoring undergraduate and graduate students to achieve success in their potential. My mentoring style is always giving students a chance to talk with me in person individually. I always treat my students with respect and kindness, and would like to build a good teacher and student relationship. During the lab hours of the classes I taught, I helped students walk through their code and test the correctness of their systems’ output. I made my best effort to schedule one-to-one talks for them. At the beginning of each talk, I asked students to present questions by themselves, and I also reminded students to take notes of our discussion, and then send a copy to me (cc: themselves) as the reference for our next meeting. I found this worked well and students can understand their problems much more clearly. Also, when students came to me with a specific question, instead of
directly giving them the answer, I encouraged them first to try explaining their intuition or initial approach to me. This way I was able to quickly pinpoint the source of their trouble and clear up their confusion. Students found this method very effective. My ultimate goal of teaching and mentoring students is to help them become individual thinkers and reach their maximum potential both in schools and later lives.

In addition to mentoring students in the classroom, I also had the opportunity to work with two Research Experience for Undergraduates (REU) students in the summer of 2013 and 2017. In 2013, the student worked on separating background usage and interactive loads from net meter data of several residential houses. This statistical learning about occupants’ physical interactions with electrical loads was included in one publication in the same year. In summer of 2017, I closely guided another REU student in big energy data analytics project. We met in person twice per week, and we discussed his doubts/questions in the project and the plan in the next few days. This work has resulted in a submission to a big data conference. Besides mentoring REU students, as the most senior member in my research group at UMass Amherst, I also mentored junior students and collaborated with students, and we were able to publish papers together in ACM BuildSys and IEEE Transactions on Smart Grid.

**Teaching Interests.** I believe my research and teaching experience has prepared me to teach a range of undergraduate and graduate level computer system and data science courses, including Distributed Operating Systems, Algorithms, Statistical Computing, Probability Theory, Machine Learning, Data Structures, Data Visualization and Exploration, Computer and Network Security. In addition, I am also interested in developing advanced systems engineering graduate seminars that align with my research area, e.g., Cybersecurity and Privacy Threats in Smart Grid, Big Energy Data Analytics, Sustainable/Green Computing, etc.