Teaching Statement

Teaching and advising students are two of my key reasons for pursuing an academic career. My teaching experiences include traditional teaching (such as lecturing seminar-based courses and serving as teaching assistants in CS courses) and informal advising (such as guiding junior graduate students in my research groups). My teaching philosophy consists of (i) engagement based on real-world problems, (ii) demonstration based on running systems and data, and (iii) inspiration based on hands-on experiences.

Technically, I am prepared to teach a broad set of system courses at both the graduate and undergraduate levels. My research experience makes me well-suited for both traditional system-related courses such as data mining, operating systems, computer networks, distributed systems, real-time computing, as well as developing courses addressing recent topics such as big-data-driven systems design and cyber-physical systems.

1 Teaching Experience

My teaching experience started when I was a master student seven years ago, teaching a group of undergraduate students who were about to enter my master program for probability theory in a seminar-based class. I have been fortunate to experience two types of teaching:

The first type is traditional teaching. During my master program, I was one of four lecturers for a seminar-based course for three years. I further served as a teaching assistant for a graduate-level Advanced Computer Architecture course, and was responsible for class lecturing, assisting with class projects and creating exam questions. During my Ph.D, I have given several tutorials and colloquium talks in different universities and research institutes. These activities taught me how to organize the material informatively, and made me realize that the role of a teacher is more about motivating and inspiring the desire of learning than reciting what has been written in textbooks. All these experiences have convinced me that teaching is challenging, enjoyable, and rewarding.

In addition to teaching in class, I was also involved in the second type of teaching by informally advising junior graduate students. When I was a leading student in a three-year research-oriented master program, I regularly met junior master students and undergraduate students about research projects for two years, and worked with them closely to guide them through difficult phases of research. During my Ph.D program, I have been spending a lot of time to informally advise other junior Ph.D students in our research groups, and further I have been regularly meeting two undergraduate students under a research project called Research Experience for Undergraduates. I tried to convey my experiences to them and teach them that creativity and practical thinking are critical to identify and solve real research problems. During the process, I find that teaching reshapes my own understanding of the material.

2 Teaching Philosophy

Based on my research results, I have been given access to world-class datasets for research and teaching purposes, which is my unique advantage for teaching. My understanding is that teaching should be more than simply conveying information in textbooks, and it should also involve engagement, demonstration and inspiration based on real-world evidence.
2.1 Engagement based on Real-world Problems

As a student myself, I found that without engagement, there is little motivation for me to learn. I will interest and engage students with real-world problems. My research significantly contributes to my teaching, because I primarily work on application, data and system level projects, which give me the opportunities to use real-world problems to motivate students to learn. In particular, I will provide extensive case studies for courses related to data-driven and application-driven systems design. Applications to real problems that students directly encounter in their daily lives can engage more effectively. I will also provide a stimulating classroom climate to encourage students to actively participate and collaboratively work together, which leads to clear responsibilities for each student and thus in turn engage them to learn.

2.2 Demonstration based on Running Systems and Data

To reach a wide range of learners, I will combine a variety of approaches to teaching, including lectures, simulation, and discussion with a special focus on demonstrations. My experience in big data would keep students interested by data-based demonstrations such as urban phenomenon visualization. They will also ensure that students understand foundational concepts and difficult ideas. For example, based on real-world datasets, demonstrating performance of a real-time scheduling algorithm with impactful visualization would be much more intriguing than going through examples in textbooks.

2.3 Inspiration based on Hands-on Experiences

Normally, students learn most when they have hands-on experiences, which is one of my methods to develop students’ problem-solving strategies. To obtain hands-on experiences, students need opportunities to work on real-world problems using authentic kinds of evidence. My research gives me the advantage to inspire students with hands-on experiences based on real-world data. For example, I am hosting a growing dataset of taxicab GPS data in six big cities: New York City, San Francisco, Roma, Beijing, Shanghai, and Shenzhen. Hands-on experiences from data-driven experiments would inspire students to explore and understand real-world problems in urban areas.

3 Summary

Through my graduate school years, I have always been both a student and a teacher, and I particularly enjoy my role as a teacher to help others in the process of acquiring new knowledge. I believe teaching is an art that requires intellectual exchange among teachers and students. One important measure of a faculty member’s success is how much knowledge he/she has helped to pass on, and I cannot imagine doing my own research without passing it onto the next generation. In short, teaching is an essential part of my life and it will continue to be in the future.