Teaching Statement

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One of the primary reasons for me to stay in academia is the opportunity to teach and mentor students, which will give me a sense of accomplishment and fulfillment. I have long benefited from being taught and mentored by many people, and I know firsthand how important a good teacher or mentor can be to his/her students. In my own case, I decided to devote myself to the data management research after taking a wonderful database course during my undergraduate studies. It is my aim to provide great experiences to my students, and support them in pursuing their career goals.

Teaching Experiences. I have been a teaching assistant (TA) for multiple classes at both the undergraduate and graduate levels, such as Database Systems, Data Structure, Advanced Topics in Data Management, and Advanced C++ Programming. My most recent teaching experience has been with Open Data Science, a master's-level class, where I delivered a guest lecture at the University of Toronto. I received positive feedback after the lecture from both the host faculty and the students for explaining the concepts and algorithms in a very clear and concise way. In addition, I was the lead TA in a Database Systems class that was taught by a professor without previous experience with the class. The professor had decided to include some recent material, such as the in-memory databases, in the lectures and assignments. As a consequence, I participated in designing the course learning objectives, revamping the course syllabus, creating and grading assignments, and holding office hours. In addition, in the Advanced Topics in Data Management course, I designed a series of implementation assignments, provided sample solutions, and created a script to automatically grade the submitted code. The assignments and grading script are still being used by subsequent course offerings. I have learned a lot from my teaching experiences. First, I learned that different teaching methods are required for the different levels of courses. I would stress more of a trial-and-error and in-depth lecture for undergraduate courses. For graduate courses, I would cover more topics and give more flexibility to the students through course projects. Second, I learned that both motivation and preparation make a course successful. The best motivation is curiosity. To that end, I plan to give real life examples and live demos and coding in my classes. I will also try to hold students' attention by carefully preparing the course materials before the class and actively interacting with them in the class.

Mentoring Experience. I have had the pleasure to work with more than 10 talented undergraduate and graduate students in Tsinghua University and MIT. Typically they have no research experience. Thus, I first work closely with my students to motivate them, review the literature with them, and explain approaches and their advantages. When they get some research experience and become more confident, I will step back and encourage them to propose their own ideas and help them to meet their goals. Yu Jiang, a master student in Tsinghua University, began working with me by parallelizing one of my similarity join algorithms. We attended a programming competition with the parallelized algorithm and won first place. After that, with my encouragement, Yu further conducted a study on comparing various state-of-the-art similarity join algorithms and published an experimental paper in PVLDB. Now he is working as a software engineer at Facebook. I have similarly mentored a junior PhD student, Wenbo Tao, at MIT by motivating him to work on an abbreviation and acronym detection project, helping him formalize the problem, and providing suggestions about his solution. This resulted in a research paper in PVLDB, where he was the lead author. He is continuing his PhD research to build a new system for data visualization, and I will continue to help him. I have also mentored a few undergraduates, who are still involved in computer science now. For example, Ruzi Zhang and Li Lu, two undergraduates I have mentored for 6 months, were admitted to Dartmouth College and CMU respectively for master's degree in computer science. Now they are working as software engineers at Amazon and Google respectively. I have learned how to give constructive advice and communicate effectively from my mentoring experiences.

Teaching Plans. I am interested in teaching both undergraduate and graduate classes. For undergraduate course, I can teach database systems, information retrieval, and data structures. I am also open to teaching other introductory courses in computer science, such as the object-oriented programming. At the graduate level, I look forward to teaching data science related courses, such as research topics in data integration, open data management, and introduction to big data. Research topics in data integration will be in the form of paper reading and discussion. The other two courses will be a series of loosely coupled lectures with an open-ended, multi-week research project.