Teaching Statement

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A key reason for my pursuit of an academic career is that I greatly enjoy teaching and mentoring students. I am fortunate to have had several inspiring teachers and mentors throughout my academic life. I consider it a privilege to be able to give that back to the community via my own teaching and mentoring.

Teaching Experience. My primary teaching experience stems from being the instructor for the course “Database Management Systems: Design and Implementation (CS564)” in Fall 2015. My class included about 50 students, both undergraduates and graduates, both CS and non-CS. I was responsible for lectures, weekly discussions, projects, homework, and exams. The course covered the basics of database theory and systems as well as some advanced “Big Data” topics. My lectures were interactive and used a combination of chalkboard and slides. I also presented surprise review questions in between topics, which the students found helpful in consolidating their knowledge. The projects provided students with hands-on experience in database design and implementation. I also held interactive demonstrations in class to show how real database administrators and data scientists might play with data. This exposed the students to unexpected quirks that arise in dealing with real data, which made the demonstrations lively and humorous. I made sure I solicited feedback from the students at regular intervals in order to keep improving the effectiveness of my teaching. I have also given guest lectures about my research at our graduate-level database course.

My Approach and Philosophy. My approach is based on four key philosophical principles. First, I strive to ensure that students get a firm grip on the fundamentals and are not overwhelmed by the details. I present in a top-down fashion, explaining the why, the what, and then the how. In some cases, I ask students to think about the how else, which shows them how active our field still is, and even teaches me something new. The students in my course opined that my approach made the subject more grasping and exciting. Second, I ensure that my class is interactive. I encourage students to ask questions during lectures, conduct interactive demonstrations, and get periodic feedback to improve myself. I also use the online group discussion platform Piazza, which enables students to learn from each other. Third, I consider humor an integral part of lecturing. I employ funny anecdotes, current affairs, and memes to lighten the atmosphere. This is no laughing matter – the students opined that this helped them to build rapport with me and made them want to attend all my lectures. Finally, I believe a key purpose of education is to build character. Thus, whenever possible, I explain how key non-technical character attributes of the people that shaped our field (persistence, patience, agility, empathy, etc.) helped them achieve what they did.

Mentoring and Leadership. I have been fortunate to be able to mentor several good students at all levels in my research. It has led to many published (or under preparation) papers and demonstrations. I guided Pradap Konda, Mona Jalal, and Boqun Yan in building parts of some of my prototype systems (COLUMBUS and SANTOKU). Pradap and Mona were graduate students. They also joined me in demonstrating those systems at conferences. Boqun Yan continued to do research with me and extended my thesis work to a new setting, as did Zhiwei Fan. Boqun and Zhiwei were senior undergraduates, and this was their first research experience. Apart from general research skills and technical skills, I also imparted to them key communication skills and gave them the opportunity to present at our group seminar. It was a rewarding experience for me to see them grow in ability and confidence throughout their projects. I am now mentoring another graduate student, Fengan Li, on a research project. Overall, I have probably learned as much from these students as they have from me. My mentoring experiences have taught me how to explain problems to students at different levels of maturity, improve my interpersonal skills, and organize my thoughts well so that my advice can be crisp and effective. I also founded and organized the Data Science Reading Group, for two semesters. It was a graduate-level group for discussing the latest research in advanced analytics. It brought together students from databases, machine learning, HCI, and some non-CS disciplines.

Courses I Would Teach. As a faculty member, I would be qualified and excited to teach courses in data management, database systems, data mining, and machine learning at both the undergraduate and graduate levels. I would also enjoy designing and teaching new interdisciplinary courses and seminars on advanced analytics/data science at both the graduate and undergraduate levels. I would also be happy to teach undergraduate-level courses on algorithms, data structures, and computer programming, as well as graduate-level courses and seminars on distributed “Big Data” systems and cloud computing.