

Teaching Statement

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During my graduate career, I have been fortunate to be able to serve as a graduate teaching assistant twice for an introductory course in computer systems security. I initially took on this role when the course was offered for the second time, and seized the opportunity to participate directly in the course's creation and development. By designing lectures, homework assignments, and class projects, I developed an acute sense of how to connect with undergraduates and make deep, technical topics clear. I also contributed to a textbook chapter on computer security based on my teaching experience in the class.

One of the guiding principles in my approach to teaching is learning by doing. During my TAships, I enjoyed infusing the lectures with in-class demonstrations and real, motivating examples. For instance, in my lock picking lecture, I prepared exercises in which students interacted directly with a set of tools to manipulate real locks. This approach proved highly motivating, and nearly all of the students volunteered to try the hands-on experience. Developing lectures that get students excited about a topic is a very rewarding experience for me.

I am eager to experiment with new techniques in teaching. I strongly believe that interactive approaches, such as peer instruction, enable students to engage more directly in their education and take greater ownership over the process than traditional lecturing. These learning models are a natural progression for my approach to teaching, because they further encourage student participation. I am also keenly interested in online education because I believe that universities should strive to make knowledge accessible to everyone. Also, online instruction presents fresh opportunities for new teaching strategies, such as the regular quizzing approach offered by the MOOC site Udacity. Such methods may enhance the learning process. Online courses are also exciting to me because they open up new research avenues to better understand and improve the learning of students.

I am excited to teach several graduate- and undergraduate-level courses. In my first year as a professor, I will design a seminar on scalable data management. The course will cover NoSQL, array databases, NewSQL, and have an emphasis on real-world applications. It will include research projects that have sufficient depth to potentially result in publication. I am also interested in designing a mid-level course on data science. This course will examine the management of massive amounts of data and the use of query languages, statistics, visualization, and provenance to extract information from it. I am also prepared to develop and teach introductory courses in databases, computer systems security, and operating systems.

I am also active as a mentor. I enjoy conducting research with motivated students. In my experience, many of the most compelling problems require a diverse set of viewpoints and benefit directly from an interdisciplinary approach. I look forward to building a lab environment where I can work directly with graduate students to identify high-impact problems and work collaboratively to solve them.

Formal and informal graduate student mentoring experience has enabled me to develop my advising style. To me, the first part of working with a student is getting to know them well enough to help them identify a research direction about which they are passionate. A student must first be intensely motivated by their research in order to do their best. After identifying their broad areas of interest, I help the student develop their research skills by beginning with well-structured problems and progressing on to more independent lines of inquiry. There are few things in mentoring more rewarding to me than watching students mature into capable researchers.

I firmly believe that it is important to give undergraduates the opportunity to engage in research early in their degree programs. Undergraduate research projects enable students to hone their critical thinking and problem solving skills and are also fertile ground for research contributions. As a professor, I will encourage my graduate students to supervise undergraduate research, preferably while working in a shared lab space. I will also dedicate myself to supporting promising undergraduates in their pursuit of graduate studies.

On a personal note, I have consistently made it a priority during my academic career to reach out to junior women in my field, via both formal programs and ad-hoc mentoring relationships. Maintaining a diverse STEM education pipeline is crucial for both keeping computer science accessible to all and continuing to grow this vibrant discipline. By adopting a supportive role to several female colleagues, I have seen remarkable growth as they became confident, independent researchers. To me, this outreach is important for increasing the participation of women and minorities in computer science and reducing their barriers to entry. In a faculty position, I will continue this effort of identifying and encouraging such students.