Teaching Statement

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My interest in teaching was sparked while I was a teaching assistant for two courses on compilers and complexity theory at Stanford. I really enjoyed the experience of helping eager, hard-working students learn the underlying concepts and methods of these subjects. Given my research interests, I look forward to teaching courses in software reliability techniques, program analysis, formal methods, mathematical logic, complexity theory, and compilers, as well as graduate courses focused on specific research topics of interest to me. I would like to share my enthusiasm for research with my students, and help them become independent researchers, as well as skilled practitioners.

I believe that teaching is inseparable from research. In many ways, teaching can help shed new light on research topics. I find that helping students understand new ideas and fundamental concepts is not only very satisfying, but also helps me think in novel directions. Students always ask penetrating questions and bring new perspectives, which help me look at problems in new ways.

In the classroom, I taught in a very interactive fashion. I wanted my students not only to understand algorithms, techniques, and proofs, but also understand the meta-reasoning behind them. I would encourage them to come up with solutions to problems on the spot, thus helping them realize why a certain method was deemed better than others. I would try to present proofs in a question-answer style. This approach was particularly useful in the complexity theory class in understanding the specifics of a certain kind of reduction or proof technique.

While teaching the complexity theory class, I wanted my students to understand why certain kinds of reasoning were valid and others were not. We would sometimes get into discussions about classes of proof techniques, and the students always appreciated this along with the mechanics of the proof itself. I would try to relate these reasoning techniques with examples from everyday life, thus making it easier for the students to comprehend. My students liked my office-hours so much that both the strongest and the weakest students came. The weaker students came for the obvious reason of understanding the material better, while the stronger students wanted to interact with me regarding hard problems beyond the scope of the class.

The compilers class was very systems oriented, where students had to write a rudimentary compiler in ten weeks. It was a very hands-on class, with lots of coding. A goal of the course was to translate theoretical understanding of algorithms into practical knowledge about designing complicated systems. I helped the students develop a certain discipline about designing and building relatively large systems. I encouraged them to think hard and long about their design and algorithmic choices, before getting into implementation. We would then discuss the pros and cons of these choices. I also encouraged them to test often, write their own tests, and use programmer productivity tools. I stressed modular design, which helped them to isolate and fix errors effectively. This gave my students a solid understanding of how to design and build large complex systems.

At MIT, I had the pleasure of advising one MS student, and working with several PhD students from different research groups. I helped these students pick suitable research topics, keeping in my mind their interests and strengths. Some students were more attracted to theoretical problems, while others to building systems. I enjoyed working with both kinds of students. I not only helped them with technical issues, but also advised them on how to go about choosing a research topic and do research, avoid pitfalls, manage life as a graduate student and be focused on the end goal. The most rewarding aspect of this experience was to observe how the students were learning to do research.

In closing, I thoroughly enjoy teaching and advising. I look forward to teaching a variety of courses, especially those related to my research topic, and helping students prepare for research and life after graduation.