

Teaching Statement

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My teaching experience spans a variety of activities, including lecturing for two weeks in a graduate program-analysis class, giving several lectures in undergraduate classes when the instructor was missing, TAing for various undergraduate and graduate classes, and being responsible for organizing large class projects. I enjoy thinking about how to explain material to students who haven't seen it yet, how to motivate the material with real examples, and how to design interesting problems for assignment and exam questions. I also enjoy interacting with students, both undergraduate and graduate. The students' minds, which are seeing the material for the first time, are less biased than my own, which absorbed the material long ago. As a result, the students' questions seem refreshing, and answering them often causes me to discover new ways of understanding the material.

My goal in a class is to teach students the core principles underlying the material, and to teach them how to use these core principles to solve more complicated problems. I believe that material learned by heart mindlessly is forgotten quickly, whereas underlying principles, well understood, have a much better chance of sticking in the minds of students. When I taught the lecture on flip-flops in an undergraduate digital design class, I chose to teach students the simple principles underlying the operation of all flip-flops, instead of showing them all the various flip-flops. In teaching the fundamentals of dataflow analysis, I started by showing the students how all analyses are in fact just fixed-point computations. I believe that once students truly understand the core principles, they will be able to rederive any material they may have forgotten, be it in an exam, or ten years down the line, using simple common sense and elementary math.

In teaching material from core principles, it is important not to sway to the other extreme, where the focus becomes so much on core principles that the link to practical examples is lost. Motivating material with real examples that resonate in the students' minds is important for keeping their attention, and good assignments and course projects play a central role to this end. When designing homeworks, both for undergraduate and graduate students, I try to devise interesting problems that will be realistic and will stretch the students' thinking. For course projects, I strive to give students an opportunity to learn the more practical aspects of the material, but without overwhelming them with details that are not central to their learning. I achieved this balance in the University of Washington graduate program-analysis class, where I devised a one-quarter-long project that exposed students to a variety of real issues in compiler design. I chose to have the students use our compiler research framework, but at the same time, I provided them with the right skeleton code and the right libraries to isolate them from the tedious and inessential details.

One of the challenges in teaching is to reach a wide variety of students with different backgrounds, different learning habits and different motivations. I like to provide a mix of activities for students to take part in, so that everybody in the class has something to benefit from. In my previous experience, I organized lectures, group discussions, group-work sessions, and even a game-playing session (where the game, of my own making, was designed to have students think about the material I was trying to teach). In trying to reach a wide variety of students, I think it's also helpful to motivate and present the material from different perspectives, and to give students references to alternate presentations of the material.

I also enjoy mentoring students. For the past six months, I have been working closely with Erika Rice, a first-year graduate student on the Rhodium project. Erika, my adviser, and I have started working on a new project that Erika is spearheading. I spend several hours a week with her talking about research. She tells me about the various problems she is currently facing, and we discuss various directions that she can take to solve these problems. We also wrote a paper submission together, and this being her first research paper, I helped her understand how to present research in a scholarly publication. I enjoy working with her in part because I like talking about research with colleagues, but mostly because of the progress that I see her making with my help. The feeling that she looks up to me for advice, and that her progress has something to do with the help I give her, is greatly rewarding.

I look forward to expanding my teaching and mentoring experience in a university environment. I would like to teach classes whose topics include compilers, program analysis, programming languages, and software engineering. I also look forward to working with other faculty members to make sure that the overall curriculum is up-to-date and prepares students appropriately for their careers.