Teaching Statement

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I am excited about the prospect of teaching both undergraduate and graduate students at your distinguished department. I was fortunate to have been instructed and advised by outstanding professors during my student years. The excitement they showed about the subject matter and their research was an inspiration in itself. I hope to set a similar example for my students.

Teaching and Advising Experiences. I have always enjoyed teaching throughout my life, starting from when I tutored high school students in math during my undergraduate years. While completing my Ph.D. at the University of Illinois at Urbana Champaign (UIUC), I volunteered to serve as teaching assistant for a graduate course on Parallel Computer Architecture for three semesters. The classes consisted of approximately thirty students. My responsibilities included giving lectures on behalf of the instructor, devising homeworks, grading them, and helping with course projects. I had the chance to give lectures on most topics in computer architecture including processor organization, cache coherence, memory consistency models, and parallel architectures.

I also enjoy advising and managing others in a collaborative environment. While serving as postdoctoral researcher at UIUC, I am currently advising two Ph.D. students on individual and joint projects. At industry, I was the manager of a team of six developers at Bluebird Soft, a mobile device company in South Korea. These experiences have been challenging but deeply rewarding.

Potential Course Offerings. Understanding how programs are compiled and how they are executed on hardware is essential for any computer science or computer engineering major. With processor architectures becoming increasingly multicore and heterogeneous, and programming languages becoming increasing managed and Just-In-Time (JIT) compiled, it is becoming even more important to acquire a rounded knowledge of the system stack to write high-performance code.

My cross-disciplinary expertise in parallel computer architectures and compilers puts me in a uniquely good position to equip undergraduates and graduates with this knowledge. I hope to share my knowledge in courses such as computer microarchitecture, parallel computer architecture, and compilers. For those interested in software and hardware support for parallelization, I wish to give a special topics courses on speculative parallelization and transactional memory. I also think a special topics course on compilation and garbage collection for JIT-compiled languages and scripting languages will be interesting.

Pedagogical Approach. While taking courses and lecturing as a teaching assistant, I observed that most of the actual learning happens outside the classroom. It is when students converge in small groups after class to exchange opinions or when they convene to discuss homework that they gain a truly deep understanding of the subject matter. Lecture time is simply too short to enable a thorough discussion. Hence, as a lecturer, I plan to maintain a mailing list where students will be required to post opinions or questions after each lecture. Students will be encouraged to respond to each other’s questions and opinions. This will engender an atmosphere of open discussion that will also positively affect the actual lecture.

I also found that students learn most when they are actively participating. Students in graduate courses will be encouraged to give short lectures in an area of their expertise or present a paper. Students in undergraduate courses will be given opportunities to present short summaries of the online discussions mentioned above.

Lastly, I learned while lecturing that students are much more engaged when I discuss the problematic issues fully before proceeding to explain the optimal solution. For this purpose, I prefer to use the whiteboard since I can customize the discussion according to the feedback and suggestions I get from students. Then, slides with explanatory figures and charts can be used to describe the solution in detail.