

# Statement of Teaching Experience and Philosophy

Aasheesh Kolli - akolli@umich.edu

My teachers in high school, college, and graduate school have had an immeasurable impact on my growth as an individual and a researcher. As a professor, the opportunity to have a similar impact on my students is something I am looking forward to. In this statement, I summarize my past teaching experiences, outline key elements of my teaching approach, and list courses I am most qualified to teach.

## Teaching Experience

As a PhD student at the University of Michigan, I held two formal teaching positions, one as a co-instructor for an undergraduate course and the other as a teaching assistant for a graduate course. I am currently co-teaching “Introduction to Computer Organization” (EECS 370) with Prof. Narayanasamy. This course aims to teach undergraduate students the fundamentals of computer organization, and with over 500 students, it is one of the largest courses offered at the University of Michigan. EECS 370 is a challenging course for the students due to the broad range of topics covered and also due to four course projects, that culminate in students developing a simulator for a pipelined processor.

As a co-instructor, I shared responsibilities for delivering lectures, supervising course assignments, preparing and administering exams, and managing a staff that included twelve teaching assistants and ten graders. We relied on an online forum, Piazza, to promptly respond to student queries. Given the scale of the class, all of the administrative duties (e.g., creating homework problems, managing course website, etc.) had to be meticulously prepared and smoothly executed. We broke up the course’s administrative into a set of twelve important tasks and for each task assigned a primary and secondary person-in-charge from the teaching staff. Throughout the semester, we held weekly staff meetings to assess the state of the various tasks, figure out next steps, and resolve any unexpected issues. Overall our management approach and our excellent teaching staff ensured that the course was well executed and well received by the students (student evaluations available in January upon request). From this experience, I have become a better lecturer, a better manager, and have also developed a deep understanding of the machinery required to manage courses of this scale.

I was also a teaching assistant for the graduate-level “Parallel Computer Architecture” (EECS 570) course with Prof. Wenisch during the winter semester in 2013. One of my primary responsibilities was helping with guiding and evaluating student research projects. In this course, students were asked to perform a semester-long project that includes significant original research. Students pursued their projects using state-of-the-art research infrastructure (e.g., architectural simulators). As a teaching assistant, my specific duties included preparing labs and tutorials to introduce students to parallel programming and research infrastructure, suggesting topics for research projects, and meeting regularly with students to guide their research. In all, I assisted eleven student groups (three members each) with their projects on various topics in microarchitecture, interconnection networks, heterogeneous architectures, and GPU programming. In subsequent years, I have been informally helping EECS 570 students that pursue projects close to my dissertation research.

## Teaching Philosophy

As a professor, I believe that it is an integral part of my job to develop critical thinking skills in my students. It is not enough for students to understand solutions to problems, but they also need to understand the concepts behind the solutions and to be able to adapt solutions to ever evolving problems. To achieve this goal, I believe that having interactive lectures where students are encouraged to question known principles are important. In my experience, in-class problems, and incentives to ask questions are a great way to have engaging lectures. For example, in EECS 370, when I offered candy as a reward for asking or answering questions in class, I saw a significant improvement in class participation. One of my cherished moments from EECS 370 was when a student contacted me saying “I really enjoyed your enthusiasm and your teachings in lectures. I would love to discuss with you about the courses to consider after 370, graduate school ...”. I will strive for providing all of my students with such an experience.

I am a strong proponent of semester-long projects as a way to promote critical thinking. In undergraduate courses, I will design projects where students incrementally build towards a complete system by applying the concepts they learn in class. In upper-level undergraduate and graduate courses, I will encourage students

to pursue original research projects. These research projects offer students an excellent opportunity to learn about scientific approaches to solving real world problems.

Apart from the impact on students, I believe that teaching, both graduate and undergraduate courses, will help me become a better researcher. While pursuing research interests, sometimes one might get bogged down by the minutiae and lose focus on the big picture. I find that teaching (and mentoring students in general), helps me better contextualize and catalogue my own research interests, allowing me to focus on the important problems and helping me better advise students with setting goals and scopes for their research projects.

And finally, from my experiences in the field of Computer Science, it is painfully obvious to me that we have a diversity problem, both among the students I teach and among my colleagues in research. To help address this issue, I organized a computer architecture tutorial for [CS KickStart](#), a program that aims to promote diversity in Computer Science via increased female enrollments. I am also a part of an initiative to collect diversity information in classes at Michigan, with the aim of identifying any unconscious bias and to develop better curricula. Much work still needs to be done in mitigating our diversity problem (not only gender, but also race, ethnicity, and sexual orientation) and as a professor, I will actively seek counsel to help promote diversity both in my classes and in my research group.

## Course Offerings

My dissertation research and graduate program have focused on multiprocessor computer architectures/systems. Hence, at the undergraduate level, I am most qualified to offer courses in digital logic design, computer organization/architecture, introductory programming, parallel programming, and systems software. At the graduate level, I am qualified to offer advanced courses in computer architecture, parallel and multiprocessor systems. Furthermore, considering that emerging technologies and specialized hardwares are shaping the future of computer systems research, I would like to introduce advanced courses on emerging memory technologies and hardware-software co-design with a special emphasis on systems software.

For teaching references, please contact Prof. Wenisch or Prof. Narayanasamy (listed in my references) .