TEACHING STATEMENT: Adam Wierman

I have had the opportunity to serve as a teaching assistant for two undergraduate courses and one graduate course while at Carnegie Mellon, as well as a number of opportunities to give guest lectures. These experiences have been a particularly enjoyable part of my education. I have taught a graduate-level performance modeling course, a first-year undergraduate course titled “Great Theoretical Ideas in Computer Science,” and I helped in the design of a new upper-level undergraduate course titled “Probability and Computing.” My student reviews for these courses averaged 4.7/5, 3.9/4, and 3.9/4. This range of courses allowed me the chance to interact with students from three different levels of motivation and background, from graduate students interested in learning the material for research purposes to first-year students who have little experience doing proofs and maybe even find math scary or boring. In all cases, I found my interactions with the students to be invigorating, and my enthusiasm for teaching carried over to the students. After I taught my second course, I won the Alan J. Perlis Student Teaching award from the School of Computer Science and received an honorable mention for the university-wide Graduate Student Teaching award. Then, after teaching my third course, I was awarded the university-wide Graduate Student Teaching award.

My goal when I teach is to act as an interpreter and guide for students: interpreting difficult material overflowing with new ideas in a way that students can understand, and guiding students through the learning process, which often happens outside of the lecture environment when the students first apply the new ideas on their own. Thus, the primary job of the teacher, inside and outside of the classroom, is to motivate the student to try to apply the new tools she is being presented. I feel that the key to accomplishing this is to design assignments that challenge, but do not overwhelm the students; and that couch difficult concepts in interesting situations, motivating students to discover new concepts on their own. This sounds straightforward enough, but without care, difficult assignments can be extremely frustrating. The key for a teacher is to create a relaxed environment where students can seek help. As a teaching assistant my goal has been to encourage students to come to office hours with study groups and work on the assignments in a setting where they can ask questions as they arise. This way, the help I give can be tuned to allow the students to have the joy of discovering the crucial insight, but to prevent the frustration of spending hours on a difficult problem without making progress. There is a danger in this sort of setting though: the teacher needs to avoid jumping in and “teaching” when a student starts to stumble. Students don’t need to be “taught” how to solve problems, they need to be guided through the process and thus allowed to learn. The only way students incorporate new ideas and develop new habits of thinking is to develop confidence by using new tools on their own.

I also try to translate this style of interaction into the classroom whenever possible. I believe learning can only happen when students are actively involved, thus my goal in a lecture is to engage and motivate the students to think rather than allow them to be passive observers. Many teachers engage their students using comedy, but my style is to use drama: I attempt to make each lecture a compelling drama with conflict and resolution; and moreover, to build throughout the course toward some ultimate goal or resolution. By filling the lecture with conflicts to resolve (in the form of questions to be answered), the lecture hall can become a thinking environment. In this environment it is possible to allow the students to guide the discussion by prompting questions that motivate the next set of definitions and derivations. Then, instead of a teacher or student centric classroom, the classroom becomes subject-centric. The focus becomes the material itself and the teacher and students become fellow scholars brought together by a common interest.

In addition to being excited about the opportunity to teach, I am looking forward to the chance to supervise both developing graduate and undergraduate researchers. I have had the opportunity to supervise one undergraduate student for a year while she completed her senior honors thesis, and I found the experience both fun and rewarding. My goal with her was to encourage independent thought, and so I was happy to help her work on ideas of her own imagination. In many cases this meant holding off on providing solutions to problems and instead allowing her to consider different avenues at her own pace. Since my work with her, she has gone on to become a doctoral student at a top university.

Because my research spans multiple disciplines within computer science, I can supervise students and teach courses in a variety of areas including: any introductory computer science course; advanced undergraduate or graduate courses in performance modeling, queueing theory, probabilistic analysis, networks, (randomized) algorithms, scheduling, and computer science theory in general. I especially look forward to teaching undergraduate performance modeling, since I view this as an extremely important area that is underrepresented in most computer science curricula.