Teaching Statement

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Those of us setting out to teach have a strong desire to share with others our excitement about our own chosen field: the enjoyment of working out an elegant and practical solution to a challenging problem and, ultimately, the importance of being able to identify and to articulate useful and specific problem statements in the first place. My preferences in teaching style strongly reflect both my own personal strengths in learning style and the feedback I’ve gotten over the years from peers, mentors and mentees.

I believe people “learn best by doing” and that there are several, practical reasons for this. Physical memories are generally easier to recall than abstract ones. The rewards of creating and/or building something are tangible and exhilarating. Also, the natural feedback one obtains through addressing real-world situations – building a controller for a real robot versus reading about PID controller design, for instance – promotes creativity, physical intuition, and the reinforcing personal satisfaction of completing a task and of doing so well.

At the same time, a solid foundation in engineering clearly requires a theoretical background. Engineers need to learn how to model physical systems, both to design things and to analyze them. My most rewarding experiences both in learning and in teaching have come when these two regimes (experimentation and theory) are well-matched. Below are a few specific examples.

• 2.70 - As an MIT student, the sophomore-level course “Introduction to Design” (then 2.70, now 2.007) was, by far, my favorite class. I learned the importance of identifying what the “hard parts” of a design were and to attack these zealously first. Seeing the rest of my machine come together successfully with relative ease after this initial, focused effort was rewarding and has had a significant impact on my approach to problem solving to this day. These are lessons I have since tried to pass on in mentorship roles in the classroom and in the lab.

• TA experience - I have held eight teaching assistant appointments at MIT. Teaching students and watching their progression years afterward has been extremely rewarding, and the student evaluations I have received over the years have consistently been exceptionally positive. Gifted educators are able to convey both (1) their subject matter (particularly the highlights and often-misunderstood details) and (2) a genuine enthusiasm for the material (and their students’ ability to comprehend it), particularly on the third iteration and beyond of teaching a subject. They are inherently driven to encourage in students that self-rewarding “Aha!” emotion we all feel when we have struggled with new ideas and finally discover we understand them intuitively. As a teacher, I aim to achieve the combination of clarity and enthusiasm that my own favorite mentors and teachers have possessed.

• Undergraduate research - MIT’s Undergraduate Research Opportunity Program (UROP) fosters early exposure in tackling science and engineering problems as part of a research team. Collaboration between faculty, graduate students and undergraduates encourages learning at several levels. Faculty encourage graduate students to take responsibility in guiding younger students in identifying a problem of their own to attack, and undergraduates gain academic maturity in taking possession of their own research tasks. My own participation in several lab groups during my undergraduate and graduate years has been extremely rewarding, memorable, and educational, and I plan to provide similar interactions within my own lab group for gifted and motivated students.

Teaching science and engineering at a school which emphasizes research and innovation provides a wonderful opportunity to keep our feet planted in both the theoretical and the experimental foundations of scientific discovery and to participate in educating future scientists and engineers. I love teaching, and I also love plunging into innovative, up-to-the-elbows research. The opportunity for faculty to share their enthusiasm for scientific investigation is one of the aspects I enjoyed most about being a student in a research environment, and I now look forward to sharing such opportunities with my own future students.