

Teaching Statement

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The unprecedented prevalence of technology paired with a dearth of graduates with technical skills means that it has never been more important for us to attract and retain the next generation of computer scientists. Our field is bursting with exciting developments at every skill level and in nearly every area of modern society. Through my experiences as a student, mentor and teaching assistant in computer science and other technical fields, I have identified my three most important objectives as a mentor and instructor – first to encourage students’ involvement in an energetic and multifaceted community, second to help them through the non-technical challenges they face along the way to their degrees and finally to cultivate in them the skills and motivation needed to continue learning and achieving even greater accomplishments than those attained by our generation.

Over the years, I have engaged in a wide variety of leadership roles which have shown me the remarkable impact of the social dynamics of a group of people on the individuals’ growth and productivity, and have allowed me to develop a set of tools and priorities to promote a positive and inclusive environment. My roles include those as one of the founding students of our research lab and NSF Variability Expedition to president of our department’s Women in Computing group and lead teaching assistant for a class of 500 freshman students with a large instructional staff including 43 upperclassman tutors. For faculty, the underlying energy of the community can be found in their department, research lab and classroom and has the power to create a lively and positive environment that has countless benefits to both students and faculty. These benefits include a broader awareness of the latest developments in our fast-moving field, a stronger network for research collaborations and career development, and the day-to-day doggedness needed to push through that next bug. I will promote such an environment by employing mechanisms for offering and receiving feedback from my mentees and peers, through organization of discussion groups and social events, and by maintaining a positive and constructive tone toward complex non-technical challenges such as engaging more women in computing. Finally, I find such subtle dynamics of a group of people fascinating, and so actively seek out and engage strategies to support the creative synergy embedded in our computing communities.

These general principles of creating a positive environment apply well to any community, but my experiences as a teaching assistant have enhanced my awareness and skill set in setting a positive and engaging tone specifically for a community of freshman programmers. In this first computer science class, the students experience a culture shock because they have such a wide variety of experience, from long-time often self-taught hackers to those who have typically viewed technology as a magical or intractable enigma. For this community, I must encourage their involvement by providing interesting but not impossible programming challenges for a wide variety of skill levels, and ease their transition into a mutually supportive environment by helping students with a wide spectrum of skill levels to understand that intelligence and potential are independent of previous experience. This pattern appears to be universal – personally, I experienced it in my intro programming course, observed it in the class I TA’d and have learned of techniques of mitigating these problems created by other universities. Moving forward, I will continue to be very attentive to my department, lab and classroom communities by setting a positive and welcoming tone and by encouraging involvement from less-senior individuals.

Beyond this introductory class, I have witnessed and helped to solve problems in retaining many talented individuals for reasons that have little to do with the technical challenges of our curriculum. Self-doubt and lack of motivation can surface in many ways at the undergraduate and graduate levels and stifles intellect, inspiration and enthusiasm that otherwise comes naturally. Fortunately, the interactions I have experienced at conferences such as the Grace Hopper Celebration of Women in Computing have equipped me well to identify these road blocks and help my mentees of either gender move past them. For example, an individual can regain control from his or her inner critic by first identifying the critic’s personality to gain independence and by second focusing on interactions with the critic which put the individual back in command. We can also find solace in recognizing that the imposter syndrome, the unshakable feeling that someone will soon find out we do not belong here, is in fact chronic for even the most accomplished, well-deserving individuals. Maintaining healthy confidence naturally improves motivation, but there are still those times when apathy sets in. By imparting the tricks I have learned to remain productive during these times, I can help students to lessen their length and negative impact. Finally, I have found that simply making these topics approachable by gently raising some key questions

during low stress conversations goes a long way to solving the problem. Each student experiences a unique mix of non-technical road blocks, and as their mentor I am prepared to help them accelerate their progress through these rough times to the far more enjoyable technical challenges.

I have identified three key skills I aim to transfer to my mentees which will give them the necessary tools and insight to become the life-long, engaged learners. First, I will help students to recognize their own learning style and how to leverage its uniqueness. There are a number of tools and concepts in psychology that can be used as a starting point, but the most effective progress is made through experimentation and thoughtful iteration. Second, I intend to develop in my students a “just try it” attitude balanced with a degree of foresight which allows the student to jump in to a topic they do not understand with little to no help. Finally, I want my students to graduate with an insatiable appetite to find and explore the “next big thing,” developed through plenty of reading, discussions and practice at searching for it. With these three skills, I hope to establish a strong foundation for my students to not only keep pace with but lead the rapid developments characteristic of computer science.

While keeping in mind these key insights regarding community, non-technical challenges and life-long learning, I look forward to instructing a wide variety of students. I could teach classes in intro circuits, signal processing, digital logic, electromagnetics, and intro programming. At the graduate level I would be most comfortable in computer architecture. I also am prepared to lead seminars of research papers in architecture. Most importantly I will be prepared for constant adaptation to my students’ needs as I mentor the next generation of creative minds.