Abida Haque

Teaching Statement

Learning computer science demands a high level of engagement from students. To drive engagement, I prefer to give students interesting problems to work on, rather than just lecturing. A lot of my learning came from simply being frustrated by difficult homework problems, and then having an "a-ha" moment where I finally solved it. I want to pass on that joy of discovery to my students.

Military Teaching Experience

I started teaching as an instructor in the United States Nuclear Navy. I was a direct input officer, an instructor who had a college background in a STEM field. I worked alongside sea returnees, who had been deployed. The students were enlisted service members, hoping to be technicians on a submarine or aircraft carrier. Working with the sea returnees taught me how theory supplements practical knowledge. Reading schematics and equations is helpful, but holding a 3-phase motor in your hands can solidify the concepts.

When I taught in the military, I learned teaching techniques that instructors were required to follow. Notably, we learned about a very specific technique to answer questions. In my first few months, I parroted this method in class, but I was struggling. Finally, I realized that the guidelines were designed to make sure that the instructor is listening and fully understands what is being asked and to ensure that the students understand the answer. Even if the instructor thinks they've answered the question, if the students look confused, some concepts are not getting through. I highlight this method because it strengthened my ability to communicate with and support students. I have carried every lesson I've learned as an instructor with me and continue to use it in my day-to-day life, both in and out of the classroom.

University Teaching Experience

As a PhD student, I was a TA for the Cryptography course. As a Masters student, I was a TA at Georgia Tech for the Computability, Complexity, and Algorithms course. In my time as a TA, I learned that students' questions often revealed a deeper misunderstanding that they were not aware they had. Many students complimented me on how I answered the real questions they had but did not know to ask.

More recently, I have been the instructor for an Introduction to Computer Science course in Java. I am fortunate to have access to other instructors and their class materials. But obviously, I cannot just go into class and read off other people's slides – it would be clear that I did not understand them! Instead, I worked on developing examples and questions that would scaffold students. I start with exercises that have the students reiterate the material, and move onto problems which allow them to put the different learning objectives together in interesting ways.

My experience in the military and in college is supplemented by my time at Facebook (Meta). Often, colleagues in other groups did not have all the context for my work. To help share the knowledge, I took some time to make "primers" explaining ideas like garbled circuits and bitonic sort, which were then shared through the internal Facebook groups.

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Advising Approach

The goal for me as a mentor is to nurture important study habits that are relevant as a researcher – getting drafts out early for feedback, understanding how to find errors in a project, and understanding how to respond to reviewers. As a PhD student interning at Los Alamos, I was assigned undergraduate students with varying levels of experience. I let post-baccalaureates work on their own and gave them space. For students who were still in undergraduate programs, I was more involved and asked for frequent check-ins. This allowed me to gauge their understanding of the material and how fast they were learning from week to week.

Teaching Interests

My experience has prepared me to teach required higher-level courses like discrete mathematics, computability and complexity theory, and of course cryptography. I can also teach any introductory courses. If given the opportunity in a cryptography class, I would make some sessions research-focused and develop a system to let students work on small research projects of their own. I am interested in following the supercollaboration technique where the students and I actively work on solving a large problem during class.

Outside of the class setting, I would like to run reading groups and problem solving groups. I envision students working on reading a paper or working on problems by themselves and then meeting to discuss what they have understood. Such meetings could be run as class seminars for credit, or be done as volunteer work if there is enough interest.