

Statement of Teaching Philosophy

Computer science is great fun. I see challenges that arise in the theory of computer science as puzzles to be solved. Moreover, the applications of computer science allow us to envision and create interesting and useful tools to solve complex problems. My fundamental goal in teaching is to instill in all my students a passion for computer science, wonder at the way it is transforming the way we live, and the skills to contribute to the field in the future.

My pedagogical approach in the classroom is continually changing and developing, based on my own assessment and feedback from students and peers. My approach has evolved to incorporate technology and involve students directly in lecture activities. Rather than simply delivering content, I believe that pedagogical outcomes are better for the students if the classes are structured so that we “discover” concepts together. My typical approach then is to start by connecting a problem to a real-world context. Then, rather than directly solving the problem, through questions and prompts, we brainstorm potential approaches and possible challenges, make connections to previous approaches, and ultimately create the solution together. Equally important, I am intentional about creating an inclusive learning community within the classroom. By learning every student’s name, highlighting the contributions of pioneers from underrepresented groups, such as Alan Turing and Grace Hopper, and encouraging class participation in a variety of ways, I strive to develop a welcoming space for all students.

I motivate students by engaging them in a variety of activities including class competitions, live demonstrations, questions from technical interviews, and short video clips. I have focused on conveying key concepts through in-class competitions ranging from [building the best recipe classifier](#) for a data mining class to [cracking the largest number of passwords](#) for a computer security class. Live demonstrations have included hacking demonstrations of computer security attacks; [visualization of sorting algorithms](#) used in a think-pair-share discussion; and an exploration of the connection between [aesthetic quality of art and the quality of solutions to the Travelling Salesperson Problem](#). I am always exploring new ideas and approaches to convey content in a manner that will most benefit the students. For instance, I often use questions that are typically asked on technical interviews. I have found that these questions are extremely interesting to the students and are also effective in preparing them for accessing internships and job opportunities.

I believe that assignments that reinforce and deepen student understanding in varied and novel ways are a critical component of effective teaching. Assignments should push students to innovate, learn, and enjoy the process of problem-solving. In addition, to ensure that all students can benefit from assignments, I believe that it is important to provide scaffolding for discovery and learning for students who might struggle with an assignment, as well as additional challenges to enable students to go beyond an assignment’s minimum requirements.

Extending student involvement in a range of activities outside the classroom enhances their education and creates a peer learning community that sparks ongoing interest in the field. This is why I have strived to contribute to competitions, for example, by serving as an organizer and judge for the [IEEEExtreme 24-hour, world-wide programming contest](#). This participation in an international context has enhanced my contribution to Penn State Harrisburg students, including co-advising the student computing club, organizing regional programming contests, and encouraging widespread Penn State student participation in programming competitions for all students, not just the strongest ones. I believe that these types of activities, along with organizing talks, panels, and trips for students, are key to extending learning opportunities beyond the classroom.

The most rewarding aspect of teaching at Penn State is impacting student outcomes for all students, from top students that secure employment at premier technology companies to those that need extra help to make it through the program. I am driven by being able to help each of my students realize their dreams and this is at the core of what informs my teaching philosophy.