Teaching Statement

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I want my classroom to be always encouraging and welcoming for students with diverse background, thus I strive to lower the learning hurdle and make the knowledge accessible to all by incorporating new technology in my teaching that sparks creative thinking. My teaching strategy and lecture format may vary according to the contents, whether students have previous knowledge about certain topics, and the feedback I receive from students.

I worked as a Graduate Teaching Assistant for two years for an undergraduate engineering/computational course with a class of ~60 people. I helped students by troubleshooting their electronic circuit design and debugging their codes. One of the lab exercises was to build a circuit for a two-way traffic light control system. Students would make the circuit on a "breadboard" with wires, LED lights, and other electrical components. The circuit was quite complicated, and their breadboards would soon become filled with wires forming "spaghetti" circuits, which could be very frustrating and time consuming. I designed a new lab practice for the class, using Arduino microcontroller to build the traffic light system, which provides the same output but with a much simpler circuit design. Without having to worry about trouble shooting the spaghetti wires, students could focus more on understanding the logic behind the circuit. In this lab, they learned to program in a language similar to C++, which is a transferable skill they could find useful in the future. Students enjoyed the new lab exercise and they could finish the assignment much faster.

During my Ph.D., I participated in the Preparing the Professoriate program and was the guest lecturer for an undergraduate-level quantitative biology course. I audited the class prior to the semester I taught. Most students were in biology majors and didn't have previous programming backgrounds. When observing an in-class coding activity, I noticed students were so busy typing the code shown on the screen, but they couldn't comprehend what the code meant at the same time. After the class, I suggested to the professor that the coding exercise could be more effective if we make the coding experience less intimidating and easier to follow so that the students can focus on the key steps in the algorithm. As a result, I designed an interactive Jupyter Notebook tutorial, where codes were organized in different blocks. Thus, a seemingly hard problem was logically separated into more manageable small steps, and students could run each block to see instant results. I also deleted lines of codes that have important functions and ask students to fill in the blank which provided a formative assessment measure.

My background in biological sciences, biological engineering, and bioinformatics allows me to speak a different language to students with different needs. Through the past years, I have mentored six undergraduate students who participated in the NSF REU summer research. These students are from different majors such as computer science, biological sciences and psychology, but all these students have published at least one journal article about the research they performed in our lab. Thus, From this mentoring experience, I learned how to lead a team and encourage students to learn from each other, and the importance effective scientific communication.