

Teaching Statement

1 Overview

Teaching and mentoring students are one of the most rewarding and exciting elements of working in academia. I enjoy teaching and mentoring students as I can share my expertise, help them develop an interest in research, and reach their potential. Furthermore, I strive to support students of all origin, background, and identities in the computer science department and I consider it my duty as a teacher and a mentor to reduce barriers for success. My teaching goals and my experience are described below.

2 Teaching Philosophy

My teaching goal is to teach students fundamental knowledge in computer science in a way that makes students develop their problem solving, critical thinking and interpersonal skills. Such an approach provides students with a deeper understanding of the material and helps them learn skills that will be useful in their future professional and personal lives. When teaching, my philosophy is to focus on these three key points:

Developing Critical Thinking: Critical thinking is an important skill that University students must learn. I want students to question existing approaches and try to improve upon them via open-ended projects that encourage students to discuss limits of existing approaches and propose new solutions that go beyond the material taught in class. Developing critical thinking increases students' curiosity, creativity, and problem-solving skills, three essential skills for professional life.

Developing Teamwork and Communication: Software products are built by teams and it is important for students to learn how to work as a team and communicate with their colleagues efficiently. Team projects and assignments will be a large part of the course I will teach and will include presentations and written reports to help students develop interpersonal skills.

Practice and Real-world applications: Students learn better if they can understand why the knowledge they use is useful and can apply it to solve real problems. I will motivate students by mapping each notion they learn to a practical problem and develop assignments where they can apply the knowledge they obtained. Practicing and connecting fundamental knowledge to real applications will help students adapt the knowledge they learn in my course to their professional life.

3 Teaching Experience

I worked as a teaching assistant (TA) at the University of Waterloo both for undergrad and graduate classes. My responsibilities as a TA for undergrad courses included designing questions for midterms and final exams, proctoring several final exams, holding office hours, designing a course project on defect prediction and delivering several tutorials on static analysis tools. I also delivered a graduate-level lecture on data-flow and control-flow graphs for the graduate course "Testing, Quality Assurance, and Maintenance" (ECE 653) in 2017 and marked students' reviews in the seminar "Software Bug Detection and Tolerance" (ECE 754). Furthermore, I have additional teaching experience as a Lab Instructor for two software testing-related courses (SE 465 and ECE 456). In addition to traditional TA duties, as a lab instructor, I also took care of all project-related elements, including tutorials on how to use specific tools on the University servers, making sure all students have access to the ECE servers and that all necessary software was installed.

Working with students is very rewarding and answering challenging questions from students pushes me to better understand the material. It is very interesting to work with students with different backgrounds (e.g., strong industry experience) as they often provide a different view of the material provided.

4 Mentoring Experience

During my Ph.D. and PostDoc, I mentored many students through various programs. I found it very rewarding to work with students of different level of expertise (from high-school to Ph.D. students) and I enjoyed advising them and seeing them learning to conduct independent research. I tried to integrate and mentor junior students for all the projects I worked on, by giving them smaller independent projects they can tackle. For example, in 2015, I mentored Wen Sheng, who did a 1-term internship as an undergrad student through the Mitacs program. I gave her advice and guidance on her project related to using Clang and LLVM to extract accurate dependencies for Chromium. After this first overview of the research program, she pursued graduate studies at Yale University and graduated in 2016. After that, I mentored several undergrad research assistants (URAs). One of them, (Mike Chong) decided to join our lab as a Masters student and continued working under my mentorship until he graduated. Lawrence Pang, another URA, even became a co-author for my latest project and decided to spend a second URA term under my mentorship. In addition, he recommended his friend, Nicholas Vadivelu to spend a term as a URA under my supervision. Moshi Wei started as a Masters student under my supervision, helping me with the automatic program repair research project. Under my supervision, he became more independent and was able to propose a different approach for automatic program repair that became the topic of his master's thesis. Finally, I also mentored two high-school students through the University Cooperative Education Program (UCEP). It was very exciting to mentor students who had no experience in computer science, helping them discover programming by giving them guidance on writing scripts and helping them understand what to expect from studying at the University. Eventually, I gave them a small project to introduce them to research by asking them to explore how to adapt our PDF inconsistency detection project to Windows and Mac OS platforms and we were able to use the scripts they developed to further complete our EMSE'18 journal article.

When working with students, I aim to have at least one in-person meeting a week with students I mentored to ensure they are making good progress in their projects and that they stay engaged with the work. Then, as we get to know each other better, we adjust the number of meetings to each student's need. This is a very rewarding experience and I am proud to have mentored many talented students.

5 Additional Experience

My experience with students goes beyond teaching and mentoring in a research context, and I love mentoring and guiding students in other academic aspects.

As a referee for the University of Waterloo Software Engineering Capstone Design Symposium Day, I also got the opportunity to follow and advice two teams of students solving real-world problems. Offering feedback and discussing the opportunities for the students to continue their projects beyond the original requirements was very exciting.

Inclusion of students from all background is very important to me and I want to help students to strive, independently from their background or identity. I gained experience helping new international students practice their English conversational skills by being a volunteer conversation facilitator for the English Conversation circles organized at the University of Waterloo. It was extremely rewarding to welcome students and talk to them in a different context, seeing their progress in communication and learning about different cultures. Going forward, I believe that these kind of activities are essential at the University to help students feel they beyond to the University, and the larger community.