

# TEACHING STATEMENT

As a person deeply passionate about the transfer of knowledge, I am motivated to become a faculty member at a university. My experiences as a graduate student myself and a teaching assistant have equipped me with insights into engaging and motivating students. Further, my industrial background has provided me with a unique understanding of the skills essential in today's industry. I am eager to use these experiences to not only enhance classroom teaching but also to guide students toward promising career paths.

## Teaching Approaches

My teaching philosophy is anchored in the concept of **teaching from a learner's perspective**. This philosophy manifested in specific approaches while I was a teaching assistant at SFU:

- **Providing clear expectations and feedback:** Clear expectations help students understand what is required for a course and allow them to focus on learning objectives. In 2016, I taught the course "*Introduction to the Internet and the WWW*". It is a popular introductory course for non-CS major students. The students' educational backgrounds are much more diverse than a CS-major class, and their study loads are usually heavy from other courses. Many of them were uncertain about the course's goal since it covers a broad range of computer science topics, which is difficult to digest for many non-CS major students.

To provide clear expectations and feedback in addition to the instructors, I asked each student about their major during the first few office hours, and also inquired about their progress in the rest of the office hours as checkpoints. I also gave suggestions about priorities to students during office hours based on their own majors and goals for this course. Meanwhile, I also asked for their feedback about me and the instructor, to adjust our teaching to the dynamics of the class. By communicating the expectation and giving feedback in this bi-directional way, the students had clear goals to focus on and have achieved improved performances, including students from non-technical majors like business and psychology.

- **Creating a holistic storyline:** This approach aids in making learning more meaningful and memorable. In the same course, I connected isolated concepts into a chronological storyline, and answered students' questions by explaining the developing history behind the scene. For example, some students were confused about the different roles between HTML and CSS. By introducing how the web evolved from Web 1.0 (static web) to Web 2.0 (interactive web), I clearly explained these two different but overlapping web development languages.

I also applied this approach to the course "*Discrete Mathematics I*" which is required for all engineering students in their first year. It was challenging because discrete mathematics is an abstract topic. To make abstract content intuitive and easy to follow, I introduced the concepts such as Sets and Graphs in a story of social networks through my weekly tutorials, and visualized these concepts using intuitive illustrations on the blackboard. The younger generation grew up with social network platforms such as Facebook and Twitter, so this storyline made abstract mathematics concepts easier for them to understand.

- **Engagement and encouragement:** While a holistic storyline created a path for the students to learn towards the goal, instructors should further enable students to leverage their support to advance along the path. The course "*Introduction to Computing Science and Programming*" in 2017 is an introductory course required for all CS major students, and it is challenging because it was taught in C/C++, which are more difficult than other languages such as Python. For this course, I focused on student engagement through problem-solving autonomy. Rather than providing direct answers, I guided students in formulating questions for searching and encouraged independent problem-solving, followed by step-by-step hints if needed. This method fostered engagement and self-discovery. In the subsequent advanced course of "*Computing Laboratory*", I observed that many students continued their journey in computer science, building on the foundation learned from the previous year. This suggests that my approach not only engaged students but also instilled a sense of self-motivation and achievement.

As a future instructor, I am committed to refining and advancing my teaching approaches. To ensure students have clear expectations and receive effective feedback, I intend to share anonymized statistics from class quizzes, course projects, and mid-term exams with the entire class. This approach will allow students to precisely understand their progress and focus areas at each stage of the course. Additionally, I plan to implement a comprehensive, semester-long project, structured in interconnected segments that align with classroom learning. This project is designed to not only enhance the learning experience but also foster a sense of accomplishment among students as they see their work evolve over the semester. To further enrich the classroom experience, I aim to incorporate various engaging elements into my lectures, such as educational videos, interactive demonstrations, and opportunities for students to present their projects, thereby creating a more dynamic and interactive learning environment.

## Teaching Interests

For undergraduate courses, I am willing to teach both **entry-level** courses such as Mathematics for Computer Science and Introduction to Computer Science and Programming (in Python), and **intermediate-level** courses such as Low-level Programming in C and Object-Oriented Programming. For graduate courses, I am able to teach both **fundamental topics** such as Numerical Optimization and Machine Learning, and **specialized topics** in my research areas: Computer Vision, Computer Graphics and Deep Learning. In these courses, I will bridge the gap between theory and practice by providing graduate students with real-world examples and hands-on projects. I also intend to develop **new courses** on applications and social impacts of emerging Artificial Intelligence techniques, such as the Large Language Model and the Multi-modal Foundation Models. Besides regular lectures, I plan to invite industrial and academic guest lecturers for talks to keep the students exposed to the latest progress.