

Teaching Statement

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The opportunity to teach and advise students is one of my strongest motivations to pursue an academic career. Through several years of experience as the instructor of undergraduate- and graduate-level courses and research supervision of several Master's and Ph.D. students, I have gained a deep insight into circumstances under which students effectively learn and conduct research, and a teacher can efficiently facilitate their learning process.

1 Teaching Philosophy

I believe teaching has two aspects. The first part involves how to provide a high quality lecture to present the classic material in class and expose students to the state-of-the-art. This can be achieved through using the best tools and resources available to give lectures (e.g., slides, whiteboard, textbooks, sample problem sets, assignments, projects, etc). The second aspect, which I believe is as important as the first aspect, is to provide the best possible learning environment for students in class. I have learned that being a real teacher is much more than being a good lecturer. For example, I often use real-world parallels, in-class exercises and brainstorming sessions, and engage students in conversations to share their ideas on how to tackle challenging problems. Thus, I am committed to both the traditional teaching philosophy as well as the active learning classroom philosophy; i.e., I believe a teacher must share his/her knowledge with students and, furthermore, the teacher and the student must venture together on a journey of discovery with the teacher serving as a guide. I believe while I should try to be the best possible lecturer in a classroom, I should serve as an in-class leader, so that I teach my students not only the material, but also the skills and motivation to learn independently.

Over the years, I have learned that in order to implement this philosophy, it is necessary to excite students about the course material and encourage them to think and act independently. Moreover, I have consistently observed that as students advance to higher levels of education, their intellectual maturity (e.g., in terms of handling assignments and conducting projects) evolves and leads them to enhanced creativity and eventually, a better grasp of the course material. Of course, the level of freedom given to students should be based on their maturity level. For instance, in freshman-year courses, I have observed that students tend to lose focus and motivation when they are left too much on their own in assignments and projects. Quite to the contrary, in senior- and graduate-level courses, I have observed that relaxing constraints on how to handle assignments and conduct projects allows students to exhibit tremendous creativity. Finally, I am always committed to openly revising my course material and teaching skills, so that I constantly improve the quality of my lectures and teaching performance.

2 Teaching Experience

I am currently supervising 2 Ph.D. and 5 Master's students in the School of Computer Science at the University of Waterloo, Canada. Most of these students have outstanding track records in their short time under my supervision. I was recognized as one of the top instructors in the Fall 2012 term in both courses that I taught: the undergraduate-level course "Logic and Computation" and graduate-level course "Computer-aided Verification". In Fall 2013, although 85 students enrolled in my section of the undergraduate-level course "Logic and Computation", as many as 140 students from other sections attended my lectures. The course notes I developed for this course are being used by several other instructors.

I have also served as the *course instructor* of the following courses: the undergraduate-level course *Operating Systems* at the University of Waterloo and the undergraduate-level courses *Operating Systems* and *Computing Concepts* at Michigan State University. I also worked as a *teaching assistant* for eight terms at Michigan State University, instructing six different courses: graduate-level course *Advanced Software Engineering* and undergraduate-level courses *Programming Languages*, *Software Engineering*, *Data Structures and Algorithms*, *Introduction to Programming in C++*, based on the ACM curriculum for CS1, and *Computing Concepts and Competencies*. I have also unofficially advised 8 graduate students at the University of Waterloo and the Verimag Laboratory. All these students have numerous publications with me.

3 Teaching Plan

I eagerly look forward to teaching undergraduate-level courses in the areas of systems (e.g., operating systems, software design, concurrent programming, distributed and real-time systems), theory (e.g., logic, theory of computation, theory of languages and compilers, and algorithm design), software engineering, and programming. For graduate-level courses, I have substantial experience in teaching courses on the following topics: dependable computing and fault-tolerance, distributed algorithms, real-time computing, theory of computation, and formal methods. I also look forward to designing and teaching new courses based on the advances in science and in industry. In particular, besides the aforementioned classic courses in computer science, I am planning to design and teach new courses on runtime monitoring of parallel and distributed systems as well as embedded dependable systems. Another course that I intend to design and teach is on automated and rigorous implementation of complex systems.