

# Teaching Statement

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My goal as an educator is to introduce students to the fascinating concepts and challenges in Computer Science. Free flow of ideas is a cornerstone of academics. It appears in various forms during peer-to-peer communications, in advisor-advisee relationships, and most pervasively during student-teacher interactions. In a constantly evolving field at the forefront of technology, the task of an educator requires an active interest in ensuring that the concepts and the ways of imparting them stay fresh. I strongly believe that to be a successful teacher one must understand and go through *a constant cycle of preparation, implementation, and evaluation*. I share below my experiences with these, drawing upon several refreshing and enlightening teaching opportunities, particularly as a *lecturer* at the University of Washington and as a *tutorial presenter* at the Conferences on Artificial Intelligence (AAAI-07/08) as well as at the Kavli Institute for Theoretical Physics in China (2008).

**Preparation:** The preparation for teaching in a natural and clear manner begins by developing a deep understanding of the subject matter. Thankfully, both the graduate curriculum at the University of Washington as well as the rigorous coursework at the Indian Institutes of Technology emphasize *breadth of knowledge*. They require courses from a large number of diverse and important fields not necessarily related to a student's specific research interests, and have thus prepared me to comfortably teach a broad range of classes at the undergraduate level. My own research is in Artificial Intelligence, with strong connections to Theoretical Computer Science. Teaching standard as well as newly designed courses in this area will be a delightful opportunity to share my knowledge and enthusiasm. As another important step in long-term preparation, I have strived to *learn how to teach* because sufficient knowledge doesn't necessarily make one a good teacher. I have frequently worked with the Center for Instructional Development and Research (CIDR) at the University of Washington. I have participated in training programs and discussions on how to be effective in a classroom where students have varied backgrounds, expectations, and skill levels.

**Implementation:** As a graduate student, I took up a rare opportunity for hands on experience: teaching an undergraduate Data Structures course as a lecturer. The task involved lecturing and organizing a class of nearly fifty students and managing workload with two teaching assistants. My goal was to make this foundational course stimulating, exciting, and challenging for the students. I achieved this by using a new *tablet-PC based interactive slide projection system* being developed at the UW, along with partial handouts that we filled together as each lecture progressed. This encouraged interaction, at the same time providing students concrete course material to take home. Having *lively programming goals* like playing songs in reverse, solving mazes, and using word patterns to identify playwrights made traditional projects fun to work on. Group programming projects and joint quizzes were my tools to make students learn to work productively as a team, an asset for any professional. Pop quizzes at the beginning of lecture were a lesson in punctuality for some. I broke the monotony of the class by having guest speakers give a glimpse of intriguing new topics like Google searches and zero-knowledge data structures.

In retrospect, this was an invaluable experience. It helped me develop my own teaching style and philosophy, and evaluate its efficacy. Prior to this assignment, I have been a teaching assistant for a variety of undergraduate and graduate courses, where I enjoyed the challenge of presenting lecture material in alternative ways during sections. I have volunteered for a one-on-one tutoring program for undergraduate students in need, and have substituted for lectures as occasions arose. During the last two years, I have prepared and delivered extensive tutorials on subjects related to my own research area, namely, the latest in automated reasoning technology. These tutorials have been very well received. The experience has taught me how to put together scattered research ideas into a comprehensive introductory material on a subject.

**Evaluation:** The ability to mold one's teaching approach based on continuous feedback from students about their grasp and needs is crucial for effective teaching. Students' interest and understanding can be perceived indirectly from homework, attendance, and quality of questions raised in class. I personally like, in addition, the more active approach of feedback forms designed specifically for this purpose. One challenge in the latter method is to convince students that they are free to critique and that their comments will receive due attention. It is important, especially for beginning educators in my position, to clarify to the students that

we are in the classroom to teach as well as to learn as a teacher. For the Data Structures course I taught, I utilized the services of CIDR at the UW to obtain concrete comments from students in the middle of the quarter, and was able to make some immediate changes based on their needs. The final survey at the end of the quarter revealed that the students had liked aspects such as *instructor's enthusiasm and knowledge, relevance of course content, and availability of help* when needed. Their overall evaluation rating was quite high at 4.2 out of 5.0.

In addition to student feedback, one must also evaluate over time the course content itself. As computer science rapidly progresses, it is critical to scrutinize the relevance and comprehensiveness of the course material. I believe this is best done by incorporating into it *a flavor of recent research results* and by looking at the way the course is taught by other lecturers and at other places.

While the challenges and the approach to teaching vary to a great extent from one discipline to another, certain key aspects are of value irrespective of what one teaches and in what context. My own teaching philosophy has been influenced enormously by a seemingly unrelated subject—the practice of martial arts, which frequently requires me to lead groups of beginner students. Over the years, this has consistently emphasized *leadership, clarity, patience, and the ability to inspire passion* for the subject, qualities that are in my opinion essential for the success of any teacher. Advances in human society rely critically on the transfer of various kinds of knowledge and wisdom from one generation to another. To accomplish this goal is the responsibility of the teacher. I believe that I have prepared myself well for this task in the field of computer science, and I look forward to it.