Teaching Statement

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I believe that teaching is the art of human communication and almost everyone can enjoy teaching if the ingredients are provided effectively. I believe that algorithms are the genesis of Computer Science (both Theory and System) and several other areas of science and engineering. Thus I am teaching and working on algorithms in both theory side and system side. My own interest in teaching and research on algorithms was strongly influenced by having great algorithmic courses in Computer Olympiad training camps, in which I presented several courses later. Before each class, I spend a fair amount of time to understand the materials to the ultimate level of teaching, and then I think about the most effective approaches of presenting the materials and even practice the lecture. In the classroom, first I give a global perspective of each topic and its relevance to the rest of computer science in order to inspire students’ interest and passion about the material. During teaching, I strive to communicate the key concepts, methods and proof techniques in the course (and not just statements of the results), as effectively and understandably as possible, while trying to make the class interesting, fun and dynamic. I believe this approach can engender not only enthusiasm for the material but also pursuit of research on course topics.

Both of my parents were high-school teachers and teaching was my dream when I was a child. My first teaching experiences return to those days that I served as a member of the scientific committee of Iranian national computer Olympiad while still being a high-school student (after winning a Silver medal in International Olympiad in Informatics (IOI) in year 1997). My main responsibility in this committee included teaching several courses on algorithms to a group of 30 talented nation-wide selected high school students (shrinking eventually to four) to participate in IOI. I covered lots of topics from text books such as Introduction to Algorithms: A Creative Approach by Manber and Introduction to Algorithms by Cormen, Leiserson and Rivest. In these classes, I tried to make assignments such that the students must interact with one another, both inside and outside of class, and play an active role in their own education. These collaborative assignments later turned into real research problems which led to some nice research papers. I believe that the algorithmic courses that we taught in the aforementioned training camp made the students enthusiastic and excited about theoretical computer science such that currently several of my previous students are pursuing this field of study at top universities in U.S.A., Canada, France and Iran. In addition at that time (1998-2000), I was the editor-in-chief of Olympiad Quarterly magazine, a magazine publishing educational papers for high-school students in the area of theoretical computer science, especially algorithms and combinatorics.

My teaching experiences have continued in high-ranking universities in Iran (Sharif University of Technology), in Canada (University of Waterloo), and in U.S.A (Massachusetts Institute of Technology). In Sharif when I was an undergrad, I was a teaching assistant for Foundations of Computer Science II (Fall 1999) and Data Structures and Algorithms (Spring 1999 & Spring 2000). In Waterloo as a Master’s student, I was a teaching assistant for Foundations of Sequential Programs (Fall 2000) and Data Structures and Data Management (Winter 2001 & Spring 2001).

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Finally, in MIT as a Ph.D. candidate, I was fortunate to be a teaching assistant for Combinatorial Optimization (Fall 2001), Numerical Analysis (Spring 2002) and Numerical Methods of Applied Mathematics (Fall 2003). For these courses, my responsibilities were recitation, sometimes teaching new topics, designing and grading problem sets and exams, holding office hours and editing lecture notes. During these courses, I had interactions with different groups of students, some of them were very bright, and I learned as much during teaching and answering their challenging questions as my students did. Since writing and presentation of research papers are key tools in computer science, I tried to develop the ability of students in these respects by giving a few deep problems whose solutions needed a very careful analysis and presentation.

Of course my teaching experiences are not limited to those mentioned above. Several courses that I took in my undergraduate and graduate studies were seminar courses or courses which needed at least one session presentation. Among these courses, I would like to mention Design and Analysis of Systems in Sharif, Advanced Topics in Software Design concentrating on Software Architecture and Advanced Topics in Text-Dominated Databases in Waterloo, Algorithms for Massive Data Sets, Seminars on Theory of Scheduling, Seminars on Internet Research Problems, Seminar in Combinatorics, Geometric Embeddings, Distributed Algorithms, and Advanced Topics on Computer Graphics in MIT. In all of these long talks, I have used effective tools of presentation like Powerpoint slides and/or handouts. In almost all of these presentations, professors and students expressed their enjoyment of my enthusiasm for the materials and gave a lot of positive feedback both in the course evaluation and in person.

Furthermore, I presented several papers in conferences (such as SODA/FOCS/STOC/MOBICOM/INFOCOM/MOBIHOC/EC) and workshops and invited one-hour talks in research institutes such as IBM T. J. Watson Research Center, IBM Almaden Research Center, AT&T Research Labs, and Microsoft Research and universities such as Berkeley, Stanford, Carnegie Mellon, Cornell, University of Washington, and University of Waterloo. In these talks, I tried to give interesting and entertaining lectures using several media such as Powerpoint slides and animations. In return, I received very positive responses and comments on the level of understandability from the audience.

Finally, I should say that I am very enthusiastic in developing new courses and new classes in the area of computer science and my experiences so far confirmed for me that I really enjoy both the process of helping people learn new materials and the process of amazing education that one gains while teaching others.