Teaching Statement

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1 Experience

My first teaching experience at MIT was as a math tutor for undergraduate classes, including calculus, differential equations, and linear algebra. Every week, for about six hours I would sit in a classroom with students who would ask me questions concerning problem sets, examinations, and other material in these courses. Most of the interaction was either one-to-one or one-to-few. I found it a challenging and rewarding experience. Oftentimes when I would search for the right way to explain my solution, I would end up understanding the problem better myself. Sometimes students would ask me questions that I had when I was taking the course, and I enjoyed sharing my personal experiences tackling the same problems. Later I was also a tutor for an undergraduate signal processing class, which was also an enjoyable learning experience.

I am also very experienced giving talks and lectures to large groups of people. As a graduate student, I have given 13 conference presentations, 3 invited talks at workshops, and 8 seminars. The audience ranged anywhere from 20 to about 150 people, sometimes my colleagues at MIT and Tsinghua University, other times experts in a specific area, and other times my coworkers during summer internships. The duration ranged anywhere from 20 minutes to an hour and a half. Oftentimes the talks were exciting and entertaining, getting people interested about certain areas and leading to future collaboration. See my C.V. for the titles and locations of my talks. I also maintain the slides for every one of my talks, which are available on my webpage http://web.mit.edu/dpwood/www/

This last term I was a course assistant for MIT’s undergraduate “Mathematics for Computer Science”, course number 6.042. This experience taught me how to run a large undergraduate-level course. I was responsible for preparing weekly homework assignments, preparing problems for the examinations, and helping to choose the material to discuss in recitations (which occurred twice a week). I also participated in weekly staff meetings, did a lot of grading, maintained the software for the course, and held other administrative responsibilities.

2 Future Teaching Plans

As an undergraduate, I was very interested in mathematics, and would probably have ended up studying Hopf algebras if it hadn’t been for a few inspiring computer science professors along the way. Therefore, as a professor of computer science, I would consider it my responsibility to communicate the beauty and relevance of the course material to my students. I would enjoy teaching introductory classes, such as algorithms, combinatorics, complexity theory, and probability, with the hope of making an impression on the lives of young students. Even if the students do not go
on to become computer scientists, they will be able to reason about these kinds of problems, which ultimately will benefit everyone.

I am also very interested in teaching new graduate-level courses based on my research experiences. For instance, I would enjoy teaching applications of coding theory to complexity theory, with an emphasis on locally decodable codes and private information retrieval. I would also like to teach an advanced algorithms course, with an emphasis on streaming algorithms and distance approximation. I would also enjoy teaching an advanced cryptography class with a special focus on techniques for achieving efficient cryptographic protocols. Finally, many of the tools I have needed have come from combinatorial linear algebra and the probabilistic method, and I would enjoy teaching these areas and trying to communicate the techniques that have come up time and again in my research.