Teaching Statement

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My main goals as a teacher are to develop students' capability and curiosity. While curiosity develops students' motivation to learn, capable and confident students develop a better sense of curiosity. This dual focus promotes more effective learning. Keeping a healthy balance between curiosity and capability also explains why effective learning is incremental learning – one must advance in steps that are enough to trigger students' curiosity but without creating too large a gap in their capability.

I have helped students develop a wide range of capabilities by teaching classes to multiple audiences, from freshman undergraduates to advanced graduate students, both in Engineering and Mathematics departments. These different audiences and topics require different capabilities and curiosity triggers, since an abstract algebra class is very different from a class in control systems. Nevertheless, in all cases, a spark of curiosity drives learning, and newly gained knowledge drives the learner to seek even greater understanding.

I have followed several guiding principles on effective classroom teaching; see my Teaching Philosophy section below. First, I will provide a detailed description of my past teaching experience and a list of classes I would be particularly excited to teach.

Past Experience

Throughout my academic career, I have been fortunate to hold multiple teaching assistant positions in mathematics, electrical engineering, and statistics courses. Starting in my fourth undergraduate year at Ben-Gurion University, I served as a teaching assistant (TA) for the abstract algebra class in the Department of Mathematics and an introductory class in stochastic processes at the Department of Electrical Engineering (EE). Later, as a graduate student, I TA'd an EE introductory class on systems and control, an EE graduate-level class on estimation theory, and a Calculus level II class in mathematics. As a PhD candidate at Stanford, I TA'd for my PhD adviser Andrea Goldsmith in the class Signal Processing and Linear Systems II (EE 102B). In all of these positions, I prepared and led TA sessions, responded to questions in forums, developed quizzes and worksheets, graded exams, and held office hours. On multiple occasions, I substituted for David Donoho in the classes Theory of Probability (STATS 116) and Introduction to Time Series Analysis (STATS 207). In addition to these university positions and experiences, I have also gained mentoring experience by guiding undergraduate students in investigating research problems related to my work. Two of these students published their work and presented them in leading conferences in the field.

Classes I can Teach

Below is a list of specific topics where I have demonstrated teaching ability.

- **Probability, statistics, and random processes** - These topics comprise the foundations of my research, and I would be excited to teach an introductory or an advanced class in any of these fields.

- **Data Science** - Following my experiences with real-world data in research and industry, I would be excited to teach an introductory class to data science that combines
topics from statistics and computer science. It covers data acquisition, cleaning, and aggregation, as well as exploratory data analysis and visualization.

In addition to the classes mentioned above, I would like to develop and teach two advanced classes based on my PhD and post-doctorate research work. In addition to the classes mentioned above, I would like to develop and teach two advanced classes based on my PhD and post-doctorate research work.

- **Data compression** - This class would provide a mathematical foundation to data compression of random signals and general purpose data. The syllabus would include modeling of stochastic signals, source coding theory, orthogonalization techniques, scalar and vector quantization, and universal data compression.

- **Inference in high dimensional generalized linear models** - This statistic oriented class would cover recent advances in inference techniques for high dimensional generalized linear models. The syllabus includes compressed sensing, phase transition analysis, approximate message passing techniques, and applications to inference in deep non-linear architectures.

**Teaching Philosophy**

I identified the following principle as necessary for fostering curiosity and capability among students.

**Focus on basics** – In the classroom, I focus on teaching the basics and teaching them well. The basics get priority because we cannot build a complex understanding without first establishing a solid foundation. I believe that every step can and should be understood before advancing to the next one. My approach not only facilitates deeper learning but also instills confidence in the students in their abilities and encourages them to pursue greater understanding. This approach does not mean that I skimp on advanced material. It simply highlights the fact that, in case of limited time, I prefer to do the basics in class and assign the more advanced material as homework.

**Make it personal** – Teachers are not simply machines to transfer materials from books to students. A teacher should animate the material by highlighting real-world examples from their research and across other fields. I always leverage my experience in research and teaching to emphasize important material. I approach teaching the same way I do research – by continually questioning my previously held beliefs, validating that I am getting the results I expect, and searching for new ways to improve. This approach not only serves the students but also drives my enthusiasm for teaching and self-growth.

**Be available** – As a TA in multiple courses, I have seen value in making myself available to students across multiple channels. This does not simply mean showing up for class - or even making office hours available. It means:

- Dedicating time before and after class to students who have additional questions.
- Devoting time to developing quality homework assignments and providing helpful feedback on tests and homework.
- Responding quickly to student inquiries and respecting them as future colleagues.

This kind of availability shows respect for and builds relationships with the students. I believe that these relationships are the most significant added value an instructor can provide in today’s learning environment, and are effective devices in closing capability gaps, triggering curiosity, and serving as motivators for students to continue their studies.