Teaching Statement

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Throughout my career, my experiences have cemented my passion and appreciation for statistics. Currently, the explosion of the data sciences has increased the demand for trained statisticians, machine learners, and applied mathematicians. I have come to appreciate statistics as a beautiful and interesting field that answers the very fundamental question, ‘how do we quantify and deal with uncertainty?’ I wish to pose this question to the future generation of scientists, engineers, and business people, and teach them how to answer it. Because of my diverse background in statistics, probability, and machine learning, I am confident that I am well suited to confer upon students the tools necessary to be a practicing statistician and the fundamental theoretical concepts to be an active researcher in modern statistics.

As a graduate student, I had the opportunity to be a teaching assistant to four semesters of statistics courses. Three of these were introductory undergraduate statistics courses. I learned what the most difficult concepts for undergraduates are when first encountering statistics. I am concerned by the prevailing belief by non-statisticians that statistics is a handful of methods that takes data and yields answers. It would be my goal to not only give students the essential skills to practice statistics in the real world, but also to impress upon students that statistics is a comprehensive framework that they can use to make decisions with data.

I also was given the opportunity to hold office hours and some recitations for an undergraduate course in advanced probability. The office hours became quite popular. I would move from table to table fielding questions and when there would be a persistent problem I would address the whole group and go over the main points. From this, I learned that it is important to anticipate the students questions, and with sufficient preparation you can identify misconceptions and lead the students to a richer understanding of the material. I found that it was extremely gratifying to see their understanding of the concepts develop and evolve.

Also, for two years, I organized the statistical machine learning reading group at CMU. By moderating topics and presenting papers, I was able to much more deeply learn material and was able to practice my presentation skills. As a result of these experiences, I have a more comprehensive understanding of statistical machine learning, and feel confident that I could design a syllabus that hits on all the key themes that have shaped this blossoming field. I am well versed in the topics most relevant to machine learning: kernel methods, graphical models, classification, high-dimensional regression, cross-validation, etc. In such a course, I think it is important to touch on the most useful tools and concepts in machine learning, such as optimization, concentration of measure, probabilistic modeling, bias-variance decomposition and overfitting. Because I took numerous traditional statistics courses, I am also well suited to teach classical statistics courses, such as probability theory, point estimation, stochastic processes, and hypothesis testing. I am confident that I will make a highly motivated professor, that can effectively teach both classical statistics and machine learning courses.