Teaching Statement

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I believe a successful professor should not only produce impactful research, but also inspire the younger generation and prepare the future scientists. I enjoy interacting with students and often find it a mind-opening process for me as well. During my PhD study at University of Maryland, I accumulated substantial teaching experience. I was the teaching assistant for an introductory undergraduate course on object-oriented programming, which provides me with ample opportunities for small group discussion and one-on-one tutoring. I have also given lectures on deep learning in a graduate-level machine learning course taught by Professor Hal Daumé III. During the Winter Storm workshop at UMD, I co-designed and gave a Python crash course for students in the Linguistics department. I also gained teaching experience through hands-on tutorials at conferences. As a post-doc at Stanford, I mentored people with a diverse background, including one undergraduate student with a non-engineering background, two CS graduate students, and one visiting scholar from industry.

Teaching is about helping students internalize different pieces of knowledge in a structured, constructive way. **My teaching philosophy consists of three key elements: intuition, peer-teaching, and practice.** At the end of a successful teaching session, students should be able to place the knowledge in a broader context, to explain the concept/method clearly to their peers, and to apply the knowledge to practical problem solving.

Intuition In my experience of teaching and giving technical talks, I find it important to explain the intuition behind a concept first before going through rigorous definitions or proofs. A motivating example provides concrete pointers to abstract concepts during illustration. More importantly, it leaves a lasting impression on students: They may forget the exact details in future, but the intuition helps them establish a reference in their knowledge system, which can always be looked up when needed. Further, while the techniques may be specific to a problem, the intuition of an approach is often more general and transferable, which helps students organize and connect knowledge.

Peer-teaching Having noticed that teaching a concept to someone else always provides me with new insights in turn, I believe students learn best when they can explain the concept to their peers. Peer-teaching is an effective way to have students working collaboratively and be active learners. My role as a teacher is to guide students to ask interesting and important questions, encourage them to think critically, and provide them with resources to learn independently. There are several ways to implement peer-teaching in a classroom setting. The most common one is in-class group discussion. I would also encourage students to involve in teaching by leading lectures and reading groups. Further, by having students review and evaluate each other's assignments, I hope they can develop critical thinking and provide complementary insight.

Practice Intuition and explanation help students to understand a concept in an abstractive way with a large picture. However, to truly grasp the skill they need to re-learn the concept by applying it to a real problem. There is often a gap between theory and practice; I think students should recognize this early on. By applying the learned knowledge to real-world applications, students can also better understand in what way does theoretical principles guide practice and what happens when theoretical assumptions no longer hold. To this end, I will design assignments and projects that connect classroom knowledge to a broad range of problems. For examples, for machine learning and natural language processing, I would like to explore datasets from neuroscience, social science, health-care and so on.

I look forward to teaching courses related to natural language processing and machine learning at various levels, such as:

- Introductory artificial intelligence for undergraduates
- Undergraduate and graduate level natural language processing, including topics on both traditional approaches and recent advances in deep learning for language representation
- Undergraduate and graduate level machine learning, with an emphasis on structured prediction and reinforcement learning
- Advanced topics in natural language processing and interactive learning, including reinforcement learning, dialogue systems, and human-in-the-loop learning