Freda Shi: Teaching Statement

Working as a teacher and mentor of students is one of the most exciting aspects of an academic career, as delivering knowledge has been a long standing interest of mine.

Experience

At the Toyota Technological Institute at Chicago (TTIC), I served as the teaching assistant (TA) for Unsupervised Learning and Data Analysis (TTIC 31220), a graduate-level course with 40 students who came from diverse backgrounds. As the only TA, I prepared and taught multiple tutorials to provide sufficient background knowledge, held regular office hours, helped design the homework assignments, and mentored students on their research-oriented course projects. I also worked together with a grader to provide timely feedback to students throughout the quarter. I enjoyed the TA experience and learned a lot about teaching and mentoring, and it was gratifying to see that all students who participated in the anonymous course evaluation gave me the highest possible ratings. Moreover, I gave guest lectures on Natural Language Processing (MPCS 53113) at the University of Chicago, talking about distributional semantics and word embeddings, a fundamental topic in natural language processing (NLP).

On the research side, I have collaborated with several junior students and researchers on NLP research projects. The collaboration process involves brainstorming ideas, providing relevant technical materials to familiarize them with the context, discussing about experiments, editing paper drafts, and going through the paper rebuttal process together. The published papers and manuscripts include [GSGS, AAAI’22] and [SSFW+, ICLR’23], with several projects currently in progress.

In addition to my experience as a graduate student, I have volunteered as a peer tutor on programming since my first year of college, and TAed for multiple introductory courses to algorithms and programming as an undergraduate. Such experience has been challenging but rewarding: through extensive interaction, I have learned how to quickly bring myself and others onto the same page, and how to encourage them to think in a more systematic way.

Approaches

Below I will describe my teaching and mentoring approaches, as well as my future plans.

Putting myself in the shoes of students. What is obvious to experts may be difficult for first-time learners. I feel it important for teachers to remember their own thoughts and feelings when they were students—I still remember my initial confusion about why recursive functions could terminate when first learning the concept, as well as how refreshed I was when I realized that every well-defined recursive function ends up with base cases for any input. When teaching others, I always provide explanations with concrete examples that have helped myself understand, and student feedback on this approach has been quite positive and encouraging.

Teaching and learning through interaction. I believe that interaction is important during the teaching and learning process. I always pay special attention to real-time student feedback, and try to incorporate their questions and comments into upcoming lectures and course materials. Furthermore, by interaction I mean...
not only the interaction between instructors and students, but also that between students and course materials such as projects. Personally, one reason that I enjoy research in NLP and machine learning application is that I can interact with my models in various ways—whenever applicable, I will design interactive course projects and encourage students to explore and to experiment as much as possible. I will also encourage my future advisees to approach their research projects in a similar way, in order to gain a thorough understanding of the models and to identify a sufficiently interesting research topic.

**Personalized curricula.** As described above, I have engaged in courses with students from various backgrounds, and am aware that this may also be the case for my future courses. To offer everyone a comfortable learning experience, I will try to tailor the course materials to the needs of individual students, and provide additional materials for those who needs background reviews and those who are interested in learning more beyond the core contents.

**Freedom with guidance and supports.** I have noticed that students, including myself, are more motivated to learn when they are given freedom to explore. When applicable, I will follow to the TTIC 31220 policy for course projects, which states that students may choose any topic of interest as long as it is relevant to the course and is approved by the instructor. Similarly, as an advisor, I will encourage my students to pursue their research interests and to take the lead in their own research projects, while also providing guidance and feedback to keep them on track. I am aware that students may require assistance in getting started and overcoming challenges: in these cases, I will be dedicated to providing them with the necessary help by working through the problems together.

**Teaching and Advising Interests**

I am interested in teaching courses relevant to NLP and machine learning at both the graduate and undergraduate levels, as they are a perfect fit for my academic background. I am also confident and happy to teach the introductory courses to computing, programming, algorithms and data structures for undergraduate students, as well as those providing mathematical foundations for computer science such as probability and discrete math. Beyond the basic courses, I am interested in developing and teaching a new course on computational modeling of human language acquisition and learning, with the goal of bridging computer science, linguistics, and cognitive science in collaboration with colleagues from diverse backgrounds.

For student recruiting, I am willing to advise and collaborate with students from various academic backgrounds, including those with a strong interest in NLP and machine learning, as well as those equipped with a foundation in linguistics, cognitive science and social sciences.

Teaching has been an important and enjoyable part of my past experience, and I look forward to continuing it in the future.

**References**
