

Teaching Statement

Teaching and mentoring are core components of being a professor, which I find enjoyable and rewarding. In the future, I aim to create an **interactive and inspiring** environment for my students. Throughout my years as a PhD student at Columbia, I have gained substantial experiences in teaching and mentoring, which has shaped my philosophy as a teacher and a mentor.

1 Teaching

Teaching experience. I have served as a co-instructor and a teaching assistant (TA) for *Conversational AI* (COMS 6998) at Columbia, a seminar course on cutting-edge dialogue research. I have also been a TA for *Advanced Software Engineering* (COMS 4156) at Columbia, a graduate class with 100+ students. Besides, I have been invited as a guest lecturer on dialogue systems for *Introduction to Natural Language Processing* (COMS 4705) at Columbia, a large undergraduate course on various NLP topics.

As a TA, a co-instructor and a guest lecturer, I designed the syllabus and assignments, prepared slides for the lectures, led discussions during class, held office hours, graded assignments, and shared feedback with students on their group projects during the semester. Through these rewarding experiences, I have developed my teaching philosophy.

Teaching philosophy. I have always believed that a good teacher should not only help students acquire knowledge but also inspire interest in their field of research.

1. *Explain with examples.* I find the most effective way to explain a concept is through examples. For instance, one student found the concept of social influence dialogue systems to be abstract. So I explained it with the example of a personal trainer bot that will persuade people to exercise, which helped her understand the concept and its importance. In the future, I plan to use concrete examples and interactive demos to explain abstract concepts during lectures.

2. *Encourage learning via teaching.* I believe one of the best ways to learn knowledge is to teach others about it. For example, in our dialogue seminar course, students will present a paper to the class and answer questions. This encourages them to research related areas beforehand. Most students find this process helps them understand the topic more deeply. As a professor, I plan to organize small study groups within the class so students can help each other review challenging topics.

3. *Motivate with everyday applications.* Another good way to motivate students is to guide them to build exciting applications. For instance, in our dialogue seminar course, people need to build a dialogue application with what they have learned and submit a report about it. In the future, I will design mini-projects as assignments and a final open-ended project to help students learn by applying the knowledge. The mini-projects will be about everyday NLP applications, such as building a machine translation system to translate English into Spanish and compare it against Google Translate, or training a simple news summarizer to update people with daily news.

2 Mentoring

Mentoring experience. So far, I have mentored three undergraduate students, four master students, and two junior PhD students from diverse backgrounds. As a mentor, I set up research plans according to their interests, meet with them weekly to manage their progress, and provide feedback to unblock them whenever they have questions. We have published many joint works at top-tier AI conferences [1–9].

Mentoring philosophy. Through my mentoring experience, I have developed the following philosophy.

1. *Show the problem-solving process.* I believe it is more important to show how to solve a problem than just giving the solution. For example, I mentored Xuewei, an undergraduate intern in our lab, on donation persuasion dialogues. The paper was initially rejected because the annotation scheme was not actionable to the reviewers. At first, we were unsure how to re-design the annotation scheme. So I suggested reviewing the literature on both dialogues and persuasion theory. Later I identified

that our scheme was too broad, and not grounded in the dialogue setting, so we had to introduce dialogue-specific acts. Then we re-designed the scheme, re-annotated and re-analyzed the data, and rewrote the paper. The revised paper received the best paper nomination at ACL 2019 [9]. She told me that this problem-solving process taught her how to approach research problems independently.

2. *Personalize the research plans.* Students have different interests and backgrounds, and I always tailor their projects accordingly. For example, I worked with Evan and Chelsea on a privacy-related NLP project. At that time, Evan was a freshman at Columbia interested in privacy attacks. Chelsea was a master student at Columbia interested in dialogues. So I designed the tasks according to their interests. I assigned Evan to review the literature on privacy attacks and implement them, and shared papers and code on dialogue simulation with Chelsea. I also scheduled weekly group meetings for us to communicate with each other. Finally, we combined our work into a paper [6], which was accepted by NAACL 2022, a top-tier NLP conference.

3. *Mentor beyond research.* Being a mentor is also about supporting the students beyond research, such as in career and personal experiences. For example, Chelsea asked me about the difference between being a PhD student and working full-time, and I gave her career advice based on my personal experience. In addition, during the pandemic, one of my students was living by herself and feeling depressed, so I invited her on a day trip and organized regular virtual social gatherings for people to share their daily life and support each other.

Group Structure. During my PhD, I greatly benefit from my supportive labmates. Therefore, when setting up my own research group, I aim to create a similar research environment with the following structure: 1) I will organize weekly group meetings, where people can present their work, 2) I will organize reading groups, where people can share recent interesting papers, 3) I will invite people from different research areas (e.g., human-computer interaction, social science, etc) for talks or social events, to broaden people’s vision, 4) I will organize feedback sessions before paper deadlines so people can learn from each other, 5) I will also set up mentoring sessions for senior and junior students so that the senior students can obtain more mentoring experiences and the junior students can adapt themselves to PhD life more quickly.

3 Future courses

I am also excited to teach and develop courses. Given my background in NLP and dialogue systems, I am qualified to teach courses in these areas.

- *Natural Language Processing:* This course will be for senior and graduate students, including traditional NLP topics and recent neural-based and prompting-based methods. Students will engage in lectures, guest lectures, homework, mini projects, and exams.
- *Dialogue Systems:* This will be an advanced course for graduate students, covering spoken dialogue systems, text-based task-oriented, open-domain and social influence dialogue systems, and state-of-the-art dialogue system building methods. Students will engage in lectures, paper reading, paper presentations, in-class discussions, and group projects.

Besides, I am also interested in (co-)developing a new course on *Interactive Learning*, which connects machine learning, NLP, and human-computer interaction to build next-generation NLP models with the ability to evolve. I am also interested in teaching other NLP-related courses such as *Computational Ethics for NLP* and *Multilingual NLP*, as well as general courses such as *Machine Learning* and *Introduction to Programming*.

References

- [1] Maximillian Chen, **Weiyan Shi**, Feifan Yan, Ryan Hou, Jingwen Zhang, Saurav Sahay, and Zhou Yu. Seamlessly integrating factual information and social content with persuasive dialogue. *The 2nd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics and the 12th International Joint Conference on Natural Language Processing (AAACL-IJCNLP)*, 2022.
- [2] Jing Gu, Qingyang Wu, Chongruo Wu, **Weiyan Shi**, and Zhou Yu. PRAL: A tailored pre-training model for task-oriented dialog generation. *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP)*, 2021. URL: <https://aclanthology.org/2021.acl-short.40>.
- [3] Shirley Anugrah Hayati, Dongyeop Kang, Qingxiaoyang Zhu, **Weiyan Shi**, and Zhou Yu. Inspired: Toward sociable recommendation dialog systems. *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2020. URL: <https://aclanthology.org/2020.emnlp-main.654>.
- [4] Yu Li, Josh Arnold, Feifan Yan, **Weiyan Shi**, and Zhou Yu. Legoeval: An open-source toolkit for dialogue system evaluation via crowdsourcing. *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing: System Demonstrations (ACL Demo)*, 2021. URL: <https://aclanthology.org/2021.acl-demo.38>.
- [5] Yu Li, Kun Qian, **Weiyan Shi**, and Zhou Yu. End-to-end trainable non-collaborative dialog system. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2020. URL: <https://ojs.aaai.org/index.php/AAAI/article/view/6345>.
- [6] **Weiyan Shi**, Aiqi Cui, Evan Li, Ruoxi Jia, and Zhou Yu. Selective differential privacy for language modeling. *Proceedings of the 2022 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL)*, 2022. URL: <https://aclanthology.org/2022.naacl-main.205>.
- [7] **Weiyan Shi***, Kun Qian*, Xuwei Wang, and Zhou Yu. How to build user simulators to train rl-based dialog systems. *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*, 2019. URL: <https://aclanthology.org/D19-1206>.
- [8] **Weiyan Shi**, Xuwei Wang, Yoo Jung Oh, Jingwen Zhang, Saurav Sahay, and Zhou Yu. Effects of persuasive dialogues: testing bot identities and inquiry strategies. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI)*, 2020. URL: <https://dl.acm.org/doi/10.1145/3313831.3376843>.
- [9] Xuwei Wang*, **Weiyan Shi***, Richard Kim, Yoojung Oh, Sijia Yang, Jingwen Zhang, and Zhou Yu. Persuasion for good: Towards a personalized persuasive dialogue system for social good. *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2019. URL: <https://aclanthology.org/P19-1566/>.