To me, teaching and advising is equally enjoyable as doing cutting-edge research. One of the most important reasons for applying faculty is that I'm confident that I'll be a good lecturer and mentor. My confidence and passion is gradually built during my career from experience, acknowledgements from my advisors or mentees, and self-discoveries. In the meantime, I have formed philosophies that I find to benefit my students the most. I expand them below. [1]

Advising and Mentoring During my graduate career as a master student at Shanghai Jiao Tong University (SJTU), a PhD student at Massachusetts Institute of Technology (MIT), and a postdoc at the University of Washington (UW), I am fortunate to have the privileges to closely mentor 6 undergrad students, 3 master students and 1 PhD student. Most of our collaborations have resulted in at least one paper published, and in three of the published papers I am recognized as the last author. I highlight some experience below:

Jingyu (Jack) Zhang, undergrad: Jack was an undergrad in Johns Hopkins University (JHU). I have been mentoring Jack for around 2 years and in the second year our relationship is more like collaboration. Our first project results in a paper [1] on controllable generation, which got the best paper award in the 2022 NeurIPS-ENLSP workshop, with me as the last author. We then collaborated (co-first-author) on a second project on language generation evaluation metrics [2], which got accepted by ACL 2023 as oral. We both think that project is one of our favourite projects. Under Jack's strong recommendation, I got contacted by another JHU undergrad, Abe Hou. The three of us worked on a semantic watermark project [3], which is currently under submission. When Jack was applying for PhD, he told me: "*Before I met you, I was not sure whether I wanted to do a PhD. Working with you, I felt the genuine joy and excitement from doing cutting-edge research. And now I'm determined.*" Jack is now a PhD student in JHU.

Xiao (Sophia) Pu, undergrad: Sophia is a female undergrad in Peking University who I have been mentoring for 6 months, and will continue to work with in the near future. Her first first-author paper on generalization of machine-generated text detectors has been accepted by EMNLP-finding 2023 with me as the last author [4]. Here I want to directly quote a thank-you email, which is a very touching and rewarding moment for me, from her:"*Tianxing, you are not only a skilled researcher, but also an exceptional advisor in my eyes. Your patience, sincerity, and warm support have played an important role in my growth as a researcher. After the EMNLP submission, you spent two months brainstorming with me on new research ideas. Each time I presented a new idea, you engaged in thoughtful discussions, analyzing its feasibility and significance. As a junior researcher, having someone like you to learn from and exchange ideas with is specially lucky for me!*" Sophia is currently applying for PhD.

Advising Philosophy: I want to empower my students and help them realize their research and career goals. Below I expand on three aspects: research skills, connections, and mental health.

- Research Skills: It is important for a junior researcher to gradually form good research taste and technical skill-sets. I exchange outstanding papers with my mentees and discuss the reasons behind their success, and encourage them to keep eyes on what's going on in other fields. During meetings, I help them check the soundness of project motivations and logical flows. Being a technical researcher myself, I conduct code/derivation reviews with my mentees and encourage them to design various tests. When they have acquired enough experience, I urge them to form their own directions and gradually become a fully independent researcher.
- Connections: Depending on my mentees' skill level and research topic, I connect them with professors or experts I know so that they can get a wider range of advice or acknowledgements.

[1] For all quotes used in this statement, I have obtained explicit and encouraging consent from the corresponding person.

For example, Sophia once proposed an idea that is out of my expertise, and I connected her with a HCI expert in UW. I also encourage them to form inside or outside collaborations. For example, Jack helped significantly in Abe's and Sophia's projects [3, 4].

- Mental Health: Doing cutting-edge research can be very frustrating. I told a lot of my own failure stories to my mentees to help them cope with them. Every time I observe my mentee's improvement, I praise him/her with huge excitement. When they make any mistake, I gently point it out and encourage them to improve.

Teaching I have been teaching since I was an undergrad. So far, I have done 5 times of teaching assistant (TA), 7 guest lectures, and numerous recitation/tutorial/project sessions. In many cases the professor directly asked me to do the job. Among the 5 times of TA, I was a "leader" TA twice. In that position (which is a special tradition from the SJTU ACM Class), I led a group of TAs to compose and teach a full programming course consisting of tutorials, exercises, and final projects. Below I highlight several experiences which also demonstrate my teaching philosophy.

Guest Lectures in UW 447+547 (NLP): My postdoc advisor (Prof. Yulia Tsvetkov) invited me to give two lectures on basics of neural networks and language models. I spent an entire week working on the slides. In these two lectures, I went from logistic regression all the way to transformer language models, with math, intuitions, connections and exercises. Knowing that the content would be challenging because this was the first time for students to encounter neural networks, I pause from time to time for review and tell students what is the most important messages to remember. Although there are huge amounts of contents, I was extremely happy to see a lot of questions and many students correctly answering the exercises I prepared, which meant they were engaging and following. One student told me she really liked the organization and logic flow in the lectures, which helped her understand how this field had evolved. My slides are available on my personal site.

Guest Lectures for SJTU ACM Class: For three consecutive years, I was invited by Prof. Yong Yu to give lectures in a course named "Advanced Research Forum". Around 12 professors from top universities (such as Standford, CMU, UCSD, etc.) are invited to this lecture series, and I am the only one invited who is not (yet) faculty (confirmed by Prof. Yu). In the lectures, I talked about my research projects and stories, and give advice on how to begin to conduct cutting-edge research. Multiple students have reported to Prof. Yu that they were quite touched by my talks.

TA for MIT 6.864 (Advanced Natural Language Processing) 2020: As TA for MIT-6.864, I contributed with huge passion to almost all aspects of the course building and teaching: I gave one guest lecture on advanced language modelling, composed one homework set, did three one-hour interactive recitation sessions with well-prepared slides and exercises, contributed problems to the mid-term exam, etc. I went to every lecture and pondered on what additional material I could gave in the recitations to aid the students' understanding. I responded timely to more than half of questions posted by students on piazza. One day there was an office hour and accidentally no other TA is available, despite I just gave two recitation sessions the day before, I still volunteered and showed up in the office hour. When the course concluded, Prof. Jacob Andreas messaged me: "*I'm extremely grateful for your huge contributions to this course. It wouldn't have gone smoothly without you.*"

Teaching Plan Due to my many TA experiences, I am experienced and willing to teach classical undergrad-level computer science courses such as programming, data structures, and algorithms. Given my research background, I am interested in teaching modern learning-related courses, including Machine Learning, Deep Learning, NLP, at either undergraduate or graduate level. Aligned with my specific research interests, I also look forward to running or leading advanced seminar classes or meet-ups on topics such as Responsible/Trustworthy Generative AI, Interactive Agents, or Efficiency in NLP in collaboration with other faculty.

References

[1] Jingyu Zhang, James Glass, and Tianxing He. PCFG-based natural language interface improves generalization for controlled text generation. In *Proceedings of the 12th Joint Conference on Lexical and Computational Semantics (*SEM 2023)*, pages 295–313, Toronto, Canada, July 2023. Association for Computational Linguistics. doi: 10.18653/v1/2023.starsem-1.27. URL https://aclanthology.org/2023.starsem-1.27.

[2] **Tianxing He***, Jingyu Zhang*, Tianle Wang, Sachin Kumar, Kyunghyun Cho, James Glass, and Yulia Tsvetkov. On the blind spots of model-based evaluation metrics for text generation. In *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pages 12067–12097, Toronto, Canada, July 2023. Association for Computational Linguistics. doi: 10.18653/v1/2023.acl-long.674. URL https://aclanthology.org/2023.acl-long.674.

[3] Abe Bohan Hou*, Jingyu Zhang*, **Tianxing He***, Yichen Wang, Yung-Sung Chuang, Hongwei Wang, Lingfeng Shen, Benjamin Van Durme, Daniel Khashabi, and Yulia Tsvetkov. Semstamp: A semantic watermark with paraphrastic robustness for text generation, 2023.

[4] Xiao Pu, Jingyu Zhang, Xiaochuang Han, Yulia Tsvetkov, and Tianxing He. On the zero-shot generalization of machine-generated text detectors. In *Findings of The 2023 Conference on Empirical Methods in Natural Language Processing*, 2023.