Helping students learn and grow has inspired my desire to be a professor. During my graduate studies, I have taught **six courses** as a teaching assistant (TA), and one Advanced Placement (AP) CS course as an instructor. I have been a major contributor in **designing an NLP course taught at both Harvard and Technion from scratch**. I have also mentored three undergraduate students and two Ph.D. students. These experiences have helped me form a teaching philosophy consisting of four major components: Student Initiative, Principled Teaching, Applied Motivation, and Rigorous Guidance.

Student Initiative A recent Harvard study showed that students learn better in classrooms that employ active learning strategies compared to passive lectures [1]. Surprisingly, this study also found that students perceive themselves to learn less through active learning, possibly due to the increased cognitive efforts required. I believe that it is our responsibility as educators to engage students in active learning, help them overcome the initial hurdle of cognitive efforts, and reap the long-term benefits of active learning.

To engage students in active learning, when I participated in the design of an undergraduate class, we designed the course to focus on **in-class labs and off-class projects**, where students work on solving programming tasks during class, and a project after class. I have set up an auto-grading system such that students can submit their solutions and receive instant feedback. This class structure enables students to work at their own pace yet receive immediate feedback, both of which are essential for active learning. It turns out that students like this design: I received a rating of **5 out of 5** (department average being 4.52) in the anonymous TA evaluation.

Principled Teaching Learning sciences provide insight into what helps people learn most effectively [2]. In my teaching, I utilize these empirical findings to create more effective learning environments. In my teaching preparation, I follow the principles of backward design [3]: identifying learning objectives, designing assessments, and selecting course materials. To polish my teaching skills, I take classes offered by the Harvard Bok Center for Teaching and Learning every semester throughout my Ph.D. I follow educational research and participate in workshops to keep learning better teaching methods. I also solicit feedback from my students to improve my teaching. In recognition of my commitment to providing quality teaching, I have won **Harvard's teaching award every year for the past three years**

Applied Motivation "Effective learning in the classroom depends on the teacher's ability ... to maintain the interest that brought students to the course in the first place" [4]. Research has shown that motivating students boosts student engagement, persistence, and attainment [5]. In my teaching, I motivate students via two channels: first, I connect the materials to students' interests; second, I share my passion for the subject with my students.

I connect course materials to students' interests by using examples that are closely relevant to them. For example, in an AP CS class I taught, I found that many of my students loved to watch YouTubers. After students learned about sorting, I designed a homework assignment where students were asked to implement a YouTube video recommendation system, where ranking is based on a number of factors such as topic relevance and video popularity. Students enjoyed the assignment and found it helpful in understanding how sorting is used in the real world.

I show my passion for a subject by sharing how I use knowledge on that subject in my own research. For example, in my AP CS class, I offered an optional class to share with students how computer science is used in my current research on Natural Language Processing. I created an in-class activity to show how good the current technology is at generating short texts. The feedback I got from my students was very positive: to quote a student from an anonymous teaching evaluation, "... He is passionate about NLP and it shines through and helps us to have motivation to keep going..." I am also very proud that one of my students got admitted to Brown University with an intention to study computer science.

Rigorous Guidance Setting high expectations for students leads to better academic outcomes [6]. In my teaching and mentoring, I set high yet achievable standards, and provide clear expectations and feedback. When teaching students, I strive to make sure my students understand the fundamental theories and principles as opposed to just memorizing facts and procedures. When mentoring students, I guide my mentees through the rigorous hypothesis-driven research process: formulating a research hypothesis, reviewing the literature, designing and conducting experiments that can possibly falsify the hypotheses, and writing up the results. This process enables my mentees to develop strong critical thinking skills. I co-authored two papers with my undergraduate mentees at ICML [7] and NeurIPS [8]. One of my undergraduate mentees got admitted to the Ph.D. program at Stanford University; one joined Google, and the other Microsoft. One of my Ph.D. mentees has submitted a first-author paper to ICLR this year [9].

Rigorous teaching can also be inclusive and motivating. When I served as the head TA, I wrote scaffolding code and detailed instructions for the lab tasks and the project, so that students with different levels of experience could all succeed in the course. I also organized TA-led, impromptu, extra recitations based on students' feedback when students needed help on challenging subjects such as tensorized operations on GPUs. In addition, I offered individual office hours before major deadlines to help students who were struggling with the course. These efforts were well-received by the students. To quote some anonymous student reviews, "Sections were super useful and informative"; "... He did an amazing job designing the labs and problem sets to be manageable, and he was also the MVP of Piazza and things that seemed impossible to debug. His office hours were life–saving."

Teaching Interests

As a professor, I would be interested in teaching core courses in Machine Learning, Deep Learning, Natural Language Processing, Probabilistic Artificial Intelligence, and/or Symbolic Artificial Intelligence. I have experience in TA'ing and designing many of these courses already. I would also be interested in teaching advanced courses such as Deep Learning for NLP, Multimodal Machine Learning, and Topics in Large Language Models.

To make my classes more engaging and useful for students, I would continue to employ active learning strategies such as in-class labs, as well as follow principles established by pedagogy research such as backward design. I would make the learning experiences of my students more fun by connecting course materials to their interests. I would also continue to set high yet achievable standards, provide clear expectations, and give timely and actionable feedback.

References

[1] Louis Deslauriers, Logan S. McCarty, Kelly Miller, Kristina Callaghan, and Greg Kestin. 2019. Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom. *Proceedings of the National Academy of Sciences*, 116(39):19251–19257.

[2] Arden N. Frandsen. 1962. Educational psychology: The principles of learning in teaching. *British Journal of Educational Studies*, 10(2):212–213.

[3] Amy Childre, Jennifer R. Sands, and Saundra Tanner Pope. 2009. Backward design: Targeting depth of understanding for all learners. *TEACHING Exceptional Children*, 41(5):6–14.

[4] Stanford C Ericksen. 1978. The lecture. *Memo to the Faculty. No. 60.*

[5] Jacquelynne S Eccles, Allan Wigfield, and Ulrich Schiefele. 1998. Motivation to succeed. *Handbook of child psychology: Social, emotional, and personality development*, pages 1017–1095.

[6] John Hattie. 2008. *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* Routledge.

[7] Yuntian Deng, Anssi Kanervisto, Jeffrey Ling, and Alexander M. Rush. 2017. Image-to-markup generation with coarse-to-fine attention. In *Proceedings of the 34th International Conference on Machine Learning*, volume 70 of *Proceedings of Machine Learning Research*, pages 980–989. PMLR.

[8] Yuntian Deng, Yoon Kim, Justin Chiu, Demi Guo, and Alexander Rush. 2018. Latent alignment and variational attention. In *Advances in Neural Information Processing Systems*, volume 31. Curran Associates, Inc.

[9] Richa Rastogi, Yuntian Deng, Ian Lee, Mert R. Sabuncu, and Volodymyr Kuleshov. 2022. Semi-parametric deep neural networks in linear time and memory. *arXiv preprint*, arXiv:2205.11718.