

Statement of Purpose

When I was first exposed to Machine Learning in high school, I was awed by its seemingly endless applications. As I've explored further with both coursework and research, I'm stunned by the creativity of solutions in ML, and honored to be part of the ML community. I hope to continue research in ML to push the field forward, and inspire younger students to pursue ML as well. I also hope to broaden my knowledge of ML through coursework and apply for PHD programs in ML in fall 2023. I am excited by the 5th year Masters of Science in Machine Learning at CMU as it would allow me to continue forward in my own goals, while also giving back to the school that I've come to love over the past 4 years.

My Junior fall, I started doing research under Prof. Nina Balcan on scalable graph-based semi-supervised learning. Working with a PHD student, the goal of our work was to show that we could use time-saving simplifications like matrix inverse approximations and sparse graphs on previous algorithms to produce more scalable results that still worked in practice. I helped update, find complexity bounds, and prove convergence for these algorithms, and wrote the code to test them in a real world setting. We plan to submit our work to conferences in late October. During this project, I particularly enjoyed the process of tinkering with solely theoretical algorithms to make them work with significant time saves, then re-proving the theoretical results on the new, updated versions.

Last summer I interned at FAIR on the vision team, specifically working on extending a paper on bias amplification in vision. My work was in creating and testing specialized subsets of the Visual Genome dataset with specific biases to benchmark bias amplification on real images (as opposed to the toy datasets used by my team previously), while also analyzing the effect of noise on these subsets. The ensuing paper is currently in submission for NeurIPS 2022. Working in many different research environments has made me more eager to continue research and learn more about the field as a whole. I always looked forward to reading meetings at FAIR, and after talking to colleagues about their work in Multimodal Machine Learning, I am very excited about the prospect of taking 10-777 in the coming year.

Teaching has also been a large part of my academic journey. Over the last 5 semesters, I've had the privilege of being a teaching assistant for 15-151/21-128 and 15-251 CS Theory, being a lead TA for 151/128 for the past two falls. I'm passionate about helping students feel the same love of learning as I do, and I believe that a strong background in math is vital to being successful in ML. I've also participated in panels on AI Research and internships in AI at CMU in hopes that my experience can help younger students who want to pursue similar paths. I'm currently taking 10-703 with Prof. Katerina, and plan to apply to be a TA for the coming fall.

My favorite classes as an undergrad have been those in the ML department, and I hope to learn even more as a Masters student. In addition, I plan to pursue independent study as an elective to continue with my research goals. I've grown to love the CMU community since I got here in Fall 2019, and would be honored to continue to push CMU forward both through research and teaching for another year. Given my current ML coursework, future coursework interests, and research experience, I feel that the 5th year program is the perfect fit.