Teaching and connecting with students is one of my greatest joys. My prior experiences have equipped me to embark on my teaching and mentorship journey as a professor.

Teaching

Experience. My teaching experiences at Princeton's Institute for Advanced Studies (IAS) and the University of Chicago have prepared me well to instruct in the future. I was a teaching assistant for a weeklong course on introductory cryptography for the annual IAS "Women And Mathematics" program. In addition to lecturing and running review sessions, I designed homework exercises that led students to re-break Engima, a WWII cipher machine.

At the University of Chicago, I worked as a teaching assistant for a class on cryptocurrencies taught jointly by Dr. Ben Zhao, a computer scientist, and Dr. Harald Uhlig, an economist. Since the course was brand-new, I designed homework for the computer science portion of the class from scratch. The series of exercises I developed led students to create a cryptocurrency called "GoodCoin," themed after the NBC show The Good Place. I also lectured on privacy-centric currencies Monero and ZCash and hosted weekly office hours.

Philosophy. My classes will challenge students academically while facilitating personal growth. In my classroom, I want students to be able to fail – bomb a test, misunderstand a concept – and receive grace to try again, while learning that this failure does not define them. Personally, I learn more from failure than success. Failure motivates me and reminds me that my performance does not determine my worth. Practically, a teaching style that allows "safe failure" may involve dropping the lowest quiz score, allowing one late homework with no questions asked, or letting students revisit missed exam questions to make up points. While some of these policies may not easily scale to large classes, I will seek creative workarounds.

I will also make my classroom a place of community. I will implement policies encouraging students to be present and engaged in the classroom. With limited exceptions, I will require that students take notes by hand to avoid distraction and maintain a strict "no phones" policy. I plan to use discussion-based class sessions, rather than lengthy lectures, to guide learning. Finally, I will work to ensure that all students – regardless of race, gender, disability status, or age – feel welcome in my classroom and have the resources they need to succeed.

Potential Classes. Based on my background, I am prepared to teach courses on introductory computer science, machine learning, security, and cryptography. Additionally, I would like to create a course on adversarial machine learning (ML). Such a class is rarely taught, despite the significance of this research area. This class would expose students to security and privacy issues in ML, helping them understand practical threats to ML models. The course would be hands-on, requiring students to implement fundamental attacks, read recent papers in the field, and discuss the ethics of ever-evolving ML applications. I am also interested in co-teaching classes at the intersection of ML and fields such as public policy and education. Cross-discipline learning opportunities are sorely needed as ML evolves.

Mentorship

Experience. As a Ph.D. student, I have advised nine high school and undergraduate students on ML and security research projects. Three of the projects resulted in papers co-authored with the students that appeared at top-tier conferences [3, 1, 2]. Outside my

graduate studies, I tutor middle school math at an after-school program in Woodlawn, Chicago. The joy I found in these experiences reinforces my desire to become a professor.

Philosophy. My goal is that the Ph.D. students I advise will graduate as *whole people* who are *excellent researchers* and, most importantly, *aware of the broader context* of their work.

Whole people: While my primary role will be to support my students' academic development, I will also encourage them to nurture other aspects of their character. I have found that pursuing non-academic interests – like volunteering, running, reading, and connecting with friends and family – makes my life more enjoyable and enhances my research creativity.

Excellent researchers: I will train my students to be excellent researchers by helping them identify and tackle novel, not incremental, research problems. I will equip them with communication skills – like writing and presenting – they will need to share their work. Finally, I will teach my students time management skills to help them maintain consistent rhythms of work and rest, avoiding burnout.

Broader context: Although other goals are important, my central objective is that my students graduate with a deep awareness of – and respect for – the broader context of their research. Computer science (CS) research papers have technical *and* societal implications since CS research often ends up in consumer-facing products. As harms caused by AI and other tech tools become apparent, researchers *must* think deeply about what their work might mean, not just what it is. Through individual conversations and lab activities, I hope to inculcate in my students respect and compassion for the world that guides their research.

Practices. To achieve these goals, I will employ different practices in individual and group settings. I will hold weekly hour-long meetings with each student I advise to ensure I understand their motives, goals, and progress. I also will adopt a "private critique, public praise" policy. Providing praise and constructive feedback on research publicly while offering student-specific critiques privately can empower students to share their ideas freely. Finally, I will require my students to reflect regularly on their research and its potential impact.

Academia can be isolating, so I also will work to make my lab a community. I hope to foster relationships among my students by having older students mentor younger ones and sponsoring nonwork gatherings, such as lunches or outings. In pursuit of the "broader context" goal, I intend to spend one lab meeting a month reflecting on the implications of our lab's research – perhaps by discussing an article or listening to a talk. Finally, I will welcome undergraduate researchers to our lab to provide mentorship opportunities for grad students.

References

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