

Throughout my education, I was inspired by teachers who encouraged us to think critically about what impact we wanted to make on the world, as future engineers, designers, and researchers. As a teacher, I want students to be able to analyze and anticipate security and privacy threats not just to computer systems, but also their users and society at large. To help students develop the technical skills and analytical mindset needed to achieve these learning goals, and to foster an inclusive environment for learning, I will incorporate teaching methods including active learning, hands-on experiences, and undergraduate research.

## Teaching Experience

During graduate school, I was a teaching assistant for *CSE484 (Computer Security and Privacy)* at UW, a junior/senior level class, for two quarters. Both times, I was responsible for delivering supplemental lectures in quiz sections (a.k.a. recitation or discussion sections), office hours, and grading written assignments. I lectured on content ranging from detailed explanations on how to exploit software security vulnerabilities in x86 programs, to open-ended discussion activities on threat modeling and ethics, to primers on academic research in security and privacy. Outside of sections, I provided one-on-one support for students in office hours and discussion boards. Prior to TAing the class, I also led a small tutoring group for students in the class.

I also have delivered guest lectures to a broader audience of undergraduates. In *CSE 120 (Computer Science Principles)* at UW, a class intended to provide exposure to computer science topics for non-majors, I presented a brief introduction to security and privacy topics, such as the threat modeling framework, the ethics of hacking, and examples of impactful research in the field. I also guest lectured in *Privacy, Policy, Law and Technology* at CMU, an undergraduate/masters/PhD course, where I gave two lectures on the history and economics of online advertising, and how web tracking techniques work at a technical level. During my guest lectures, I also participated in a teaching observation session from the CMU Eberly Center for Teaching Excellence & Education Innovation, and received feedback on my teaching techniques and classroom management skills. To further my teaching skills, I have also been attending seminars with the Eberly Center on teaching techniques, such as inclusive teaching, and adapting to generative AI in the classroom.

## Teaching Philosophy

**Developing Technical Skills for Security and Privacy** I want students to develop the technical skills necessary to analyze and anticipate computer security and privacy threats. I believe it is important to learn these skills through practical experience with coding, problem-solving, and collaboration. As an instructor, I plan to design my courses with a focus on hands-on, experiential learning. For lower-level classes, I hope to update the curriculum to use modern programming languages, frameworks, and attacks that students will encounter in the real world, and design assignments that provide quick feedback loops that enable self-experimentation. I also hope to teach capstone courses where students can experience the full arc of realizing a large project, including iterating, prototyping, and evaluating with experiments or user studies.

To assess students' progress in hands-on classes, and ensure that students do not fall behind, I plan to build in space for one-on-one instruction from myself and my teaching assistants. I observed the importance of this as a TA for Computer Security and Privacy. In the first assignment, students had to write exploits for x86 binaries using techniques such as buffer overflows and double free attacks. These problems depended on having a strong mental model of memory allocation in C. To ensure students from different levels of experience and familiarity with the material could succeed, I dedicated a significant amount of time for one-on-one instruction, including holding extended office hours sessions, and actively monitoring the discussion board for questions. This experience also helped me assess whether my discussion section lectures successfully helped students learn the necessary concepts. As an instructor, I plan to ensure that students are supported through challenging, hands-on activities.

**Developing Inclusive Conceptions of Security and Privacy** I want students to develop a broad, inclusive mindset of what constitutes a threat or harm in the context of computer security and privacy. Increasingly, technologists must consider the societal and ethical risks of deploying new technologies, and whether specific vulnerable populations might be disproportionately impacted, such as seniors, ethnic minorities, or children. Who will benefit and who will be harmed? Can the benefits be spread fairly and equitably? Towards this goal, I plan to integrate ethics as a core part of my curriculum. In a security and privacy class, this could include content on topics like algorithmic fairness, privacy regulation, and cryptographic tools, where we critically examine the impacts of these technologies, especially on marginalized populations, and the values and decisions of technologists and policymakers that led to them.

I also plan to incorporate active learning techniques into my teaching to improve participation and inclusivity in the classroom. In my guest lectures and TA sections, I found that discussions and in-class group assignments not only give students time to reflect and actively apply their skills, they provide opportunities for students who are less likely to speak up in a lecture setting to participate. For example, as a TA for *Computer Security & Privacy*, I added new discussion activities to quiz sections where the instructor primarily lectured about on conceptual content, like frameworks for threat modeling security and privacy risks in emerging technologies. In these activities, I started class with an introduction of the framework, broke students into groups and asked them to apply the framework to a technology of their choice, and present their findings to the class at the end of the period. Through these activities, I observed that a broader set of students were engaged, and I was often surprised by students' perspectives in the informal presentations. I plan to regularly use these techniques to help students from non-traditional backgrounds have their voices heard, and shape conversations about the risks and harms of technology.

**Supporting Undergraduate Research** I want undergraduates to gain hands-on experience with research through involving them in my lab's research. For undergraduates, research can provide hands-on learning opportunities beyond the scope of courses and help them decide if they want to pursue a career in research, particularly for students from non-traditional backgrounds. For graduate students in my lab, including undergraduates in the lab provides opportunities for the graduate students to gain mentorship experience.

During my PhD, I had the opportunity to mentor several talented undergrads: Rachel McAmis (now a PhD student at UW) on built measurement tools for studying ad targeting (IMC '22), Theo Gregersen (now a BS/MS student at UW) helped apply NLP techniques to analyze ad content (IMC '21), Maia Xiao and Manasi Shah on built a public interest ads archive for our political ads dataset (IMC '21), and Mitali Palekar developed for our encrypted email client (Euro S&P '17).

I use several strategies to support successful undergraduate research: I adapt projects to students' skillset, strengths, and interests; I make sure to appropriately scope and structure projects so that students have enough direction but also space to explore; and I work hands-on when necessary to help students get started or overcome barriers. As a faculty member, I plan to obtain funding for REUs to enable more women and underrepresented minorities in CS to participate in undergraduate research, either through my own grants, or through leading or assisting on an REU site grant. I also am interested in organizing events to promote undergraduate research opportunities department-wide: for example, as a grad student, I participated in departmental undergraduate research colloquiums, where labs interested in recruiting undergraduates gave short, accessible presentations describing their projects.

## Teaching Plans

As a new faculty member, I would be excited to teach a variety of classes broadly in my areas of expertise. Based on my research background, I would be able to teach a general course on Security and Privacy, as well as specialized courses in the field, such as Usable Security and Privacy, Web Security, or Tech Policy. I would also be qualified to courses in other areas of my expertise, such as Human Computer Interaction and Qualitative and/or Quantitative Research methods. Also, based on skills I developed in an industry setting, I would be able to teach courses on topics such as Software Engineering, or supplementary courses such as or supplementary courses such as Systems and Software Tools that introduce students to Unix and software development tools.