TEACHING STATEMENT
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My teaching and mentoring experiences have provided me with a strong foundation for a career in academia. At Virginia Tech, I served as a teaching assistant for user interface software in Fall 2022 and Fall 2023, where I designed assignments and exams, guided course projects, and led weekly two-hour discussion sessions attended by over 40 students. I also held regular office hours to support students individually, which helped me better understand diverse learning approaches and challenges. In both semesters, my teaching performance was rated `High` (7+ out of 9) by students. In addition, my experience at Educative, an interactive learning platform for software developers, honed my ability to design clear, example-driven technical explanations that make complex programming concepts accessible to a wide audience. Together, these experiences have reinforced my commitment to computer science education and my enthusiasm for mentoring the next generation of researchers.

Teaching Philosophy.

My teaching philosophy is grounded in three principles shaped by my experiences as both a student and a teaching assistant. First, I believe students learn best when they actively shape their learning rather than passively receive information. In user interface software, I implemented a `Propose and Challenge` activity in which students were divided into two teams to evaluate alternative website design options. For example, debating alternative designs for a website's cookie consent banner, such as prioritizing user privacy by minimizing data collection versus enhancing user experience through personalization. Each group presented arguments for their position, after which we collaboratively listed the pros and cons of each design and discussed trade-offs in usability, transparency, and compliance with privacy regulations. The session concluded with a collective decision on the most balanced design, helping students understand how design and engineering choices directly shape user trust and privacy outcomes.

Second, I emphasize collaborative and two-way learning in the classroom. I frequently used the `Think Pair Share` technique, , introduced to me by my Ph.D. advisor Muhammad Ali Gulzar, where students first think about a question individually, then discuss it with a peer, and finally share their responses with the class. For example, in one of my guest lectures on web privacy, I asked students whether blocking all online ads is an ethical and sustainable solution, considering that free content and services often depend on data-driven advertising. Students first noted their individual stance, then discussed with peers the trade-offs between user privacy, free access to information, and platform sustainability. The discussion revealed diverse perspectives and encouraged students to think critically about balancing privacy protection with the economics of the web.

Finally, I actively seek `student feedback` to refine my teaching methods. During the two-hour discussion sessions for user interface software, I initially relied solely on slides to explain key concepts. However, students suggested that using the whiteboard to illustrate design flows and event-handling logic would make the material easier to follow. I incorporated this feedback in subsequent sessions, combining visual explanations on the board with slide-based examples, which led to more interactive discussions and clearer understanding of complex topics.

Mentorship Experience.

I have gained valuable experience from my advisor and collaborators through my first research project. This experience taught me how to structure research effectively by taking small, well-defined steps to validate a hypothesis before moving on to large-scale experiments. I apply the same approach when mentoring students, encouraging them to think critically, set incremental goals, and build confidence through steady progress.

My first mentorship experience was with an undergraduate student, Bless Jah [3], whom I guided on his first research project. I began by introducing the main idea and helping him break it into clear, manageable tasks. Throughout the project, I encouraged open communication and made sure he felt comfortable asking questions and discussing challenges. This mentorship led to tangible research outcomes, including a Best People's Choice Award for our joint project, co-authorship on research publication [1], and also got featured in VT News [2]. I later helped him prepare for his conference presentation, where he successfully presented our work to an international audience. We have also submitted another incremental work in the same direction that further builds on our initial findings.

I have also mentored a graduate student, Muhammad Danish, who was working with my advisor during his rotation. Since he joined the program after his undergraduate, he was new to academic research and to the field of security and privacy. The first key challenge was to help him build the necessary background and conceptual understanding to engage with ongoing research. Over the course of two consecutive semesters, I guided him through foundational topics while we worked together on a project evaluating privacy perceptions across different user communities. This mentorship ultimately resulted in a publication based on our collaborative work [1].

I am currently mentoring an undergraduate student, Gabriel Pacheco Martinez [4], who has a strong background in cybersecurity and a solid understanding of core privacy concepts. He is leading the research direction on privacy

concerns in HTTP custom headers under my guidance. Together, we first validated our hypothesis that custom headers can be used to collect user identifiers. Gabriel developed the experimental framework under my mentorship and later executed large-scale experiments to test our findings. We held several whiteboard discussions to refine the research narrative, define clear objectives for each experiment, and align them with our research questions. This work has now been completed and is under submission.

Guest-lectures. Additionally, I have had the opportunity to mentor and engage students through invited guest lectures at Washington University in St. Louis (Data-Driven Privacy and Security) and Virginia Tech (Future of Security). In these sessions, I discussed topics such as web tracking defenses, function-level JavaScript blocking, and privacy-preserving program analysis, while guiding students through open research questions and practical challenges in building privacy-enhancing technologies.

Prospective Courses.

I am deeply enthusiastic about teaching both basic and advanced-level courses in Software Engineering and Computer Security and Privacy. At the advanced level, I am particularly interested in developing and teaching courses such as Software Debugging and Testing, Data-Driven Privacy and Security, and Web Privacy, which emphasize hands-on learning, empirical analysis, and the integration of research insights into practical system design. These courses would help students understand how reliability, security, and privacy intersect in modern software systems. At the foundational level, I would enjoy teaching courses such as Introduction to Computer Security, Cybersecurity Fundamentals, and Software Design Patterns, where students learn to design reliable and secure systems from first principles. If needed, I can also teach core courses like Data Structures to help students strengthen their technical foundations. Through this combination of foundational and advanced teaching, I aim to help students develop a holistic understanding of how to design, build, and maintain secure and dependable software systems.

References

[1] A. H. Amjad, M. Danish, B. Jah, and M. A. Gulzar. Accessibility Issues in Ad-Driven Web Applications . In *2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE)*, pages 2393–2405, Los Alamitos, CA, USA, May 2025. IEEE Computer Society. URL: https://doi.ieeecomputersociety.org/10.1109/ICSE55347.2025.00171, doi:10.1109/ICSE55347.2025.00171.

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