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Teaching Statement

1 Teaching Philosophy

At the core of my teaching philosophy is the goal of cultivating critical thinkers who use computing to make our society more equitable and safe. I believe that concepts across the CS curriculum, from algorithms and data structures to AI and cyber-physical systems, are essentially powerful tools for identifying the root cause behind contemporary societal and economic issues, such as unequal access to technology and basic necessities such as clean drinking water and affordable healthcare. In my courses, I aim to cultivate curiosity by encouraging students to view real-world problems, regardless of the application area, as technical challenges that can be systematically analyzed and solved through thoughtful design. This curiosity, in turn, would foster habits of continuous self-learning and collaboration, preparing them to contribute meaningfully to research and engineering efforts that improve people's lives. The famous Greek-Roman philosopher Plutark expressed this better: *"For the mind does not require filling like a bottle, but rather, like wood, it only requires kindling to create in it an impulse to think independently..."*. To guide students toward this mindset would be both an honor and a deeply fulfilling responsibility.

2 Teaching Experience and Goals

I have served as a Teaching Assistant for 11 terms at the Indian Institute of Technology Madras (IITM), for courses in programming, VLSI design, and VLSI testing. At the University of British Columbia (UBC), I co-taught a course on Algorithms and Web Programming with Prof. Sathish Gopalakrishnan for the Vancouver Summer Program in 2023 and 2024. These experiences offered me distinct opportunities for growth. At IITM, I primarily assisted my advisor, Prof. Veezhinathan Kamakoti, in teaching VLSI-focused courses that were outside my research scope. However, teaching these courses pushed me to learn the subject in depth so I could better support and engage with students. At UBC, I taught international students with diverse academic backgrounds and varied levels of English proficiency. This experience motivated me to connect with students individually and adapt my teaching materials and delivery style to ensure that every student could benefit meaningfully from the course. My teaching experiences provided me the following insights.

1. **Effective teaching requires continuous learning and self-improvement**. As a teacher in Computer Science, I would like to stay updated with the latest technological advancements, incorporate them in my course materials, and refine my instruction techniques accordingly.
2. **Understanding students as individuals is essential.** Learning about students' backgrounds, prior education, and learning styles helps identify their strengths and weaknesses, enabling targeted guidance that supports their growth.
3. **Teaching is inherently an optimization problem.** No single approach works for every student; strategies must be adapted to maximize overall learning while still supporting those who need additional help. This requires balancing structure with flexibility and continually adjusting based on classroom feedback.

During the Vancouver Summer Program at UBC, I had the opportunity to apply these insights directly. I taught a class of international students with varying levels of English proficiency and academic background–a diversity I had not anticipated on the first day. At first, students found it hard to follow my slides because they relied more on visuals than text. Moreover, many students tend to shy away from voicing their inconveniences in class. Noticing their discomfort, I sent out a short Google Form to learn about their background, comfort with my

pace, and prior exposure to the topics. Based on their responses, I redesigned my lectures and slides by adding succinct textual explanations alongside visuals, slowing my pace of speech, making my lectures interactive, and incorporating interesting and relatable real-life examples (e.g., how dating apps work, the story behind the Google search engine, Wi-Fi congestion resolution techniques). I also distributed background materials in advance, allowed the students to record the lectures, and introduced small participation incentives to encourage engagement in class. These adjustments significantly improved classroom participation and learning experience, as reflected in the daily feedback I received from the students.

As a teacher, my goal is to refine my instructional practices and continually strive for perfection. I am fully open to pedagogical training and professional development that would strengthen my teaching skills. I also aim to be an approachable mentor, someone students feel comfortable coming to with their questions and challenges, and who fosters an environment that supports open, constructive dialogues.

Courses. Apart from the undergraduate courses on algorithms, networking, network security and data structures, I would like to teach the following advanced courses: security of cyber-physical systems, AI for security, and cybersecurity for emerging technologies. Through teaching these courses, my goal is to equip students with the practical skills valued by industry and the research mindset needed to address open-ended problems.

3 My Goals as a Future Research Advisor

My primary goal as a research advisor is to guide my students toward becoming independent and successful researchers. While deep technical expertise in their research topic is essential, being a successful researcher today requires a far broader set of skills. As an advisor, my role would be to provide my students with the right tools, techniques, and professional opportunities.

I would train my students in core research methodology, and teach them to uphold high standards of research ethics. It is also important to help them develop habits that sustain long-term productivity: maintaining consistency, managing time effectively, and navigating the inevitable setbacks that accompany research. I believe that learning to accept constructive criticism, and persevering through uncertainty is as important as mastering any technical skill.

Modern researchers must also be able to communicate their work clearly and persuasively to diverse audiences in various formats. I will actively mentor my students in writing papers, giving talks, designing posters, and creating publicly accessible materials such as tutorials and open-source artifacts to disseminate the knowledge we generate through research. These skills would ensure that their contributions have a broader impact.

I will also provide my students with professional opportunities that support their growth beyond the lab. This includes offering financial support for attending workshops, conferences, and professional training. I will introduce them to my network of collaborators, mentors, and other researchers, enabling them to build professional connections, gain visibility in the research community, receive feedback from multiple perspectives, and access potential collaboration opportunities that can enhance the scope and impact of their work.

In my postdoc, I have mentored one PhD student and two Master's students, and throughout my PhD and postdoc, I have supervised multiple undergraduates and research interns. These students came from diverse cultural and educational backgrounds, and over time, I have developed very amicable relationships with each of them. Mentoring them has taught me how to tailor my guidance to different skill levels, provide constructive feedback, and support both professional and personal growth–lessons that will continue to guide my approach as an advisor.

Finally, I see advising as a long-term research partnership. Therefore, I will strive to create an environment where my students feel supported, trusted, and encouraged to explore bold ideas. My goal is to help them build confidence in their judgment, discover their unique strengths as researchers, and ultimately prepare them for successful research careers.