Teaching Statement

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Academic life offers a unique opportunity to interact and influence young and bright minds. Teaching in particular leaves lasting marks on future professional lives of students. I believe that as a professor I should take this opportunity with an equal weight of responsibility. Because what is at stake is shaping the minds of future change makers. I also choose to perceive being a professor as a lifetime platform for improving my own skills so as to be a better teacher and mentor down the line. One should only strive to be a better teacher, not a perfect one. In what follows, I provide a highlight of my teaching philosophy, experience, and plan.

Teaching Philosophy and Principles

Beyond mere transfer of facts: My principle in teaching is that beyond effectively conveying what one knows, one has to guide students in tapping their own, often hidden, potential. Only then a teacher shall produce truly better thinkers who can unlock their very own potential to make the world a better place. My delight in teaching comes from that eye-opening moment when I see the smile of enlightenment on the face of curious (confused) students in my class. I cherish the eureka moment my students undergo from the "don't know(understand)" to the "Aha! got it now!" state of mind.

Beyond finishing a course or a degree: During my undergraduate and graduate studies, I noticed that professors focus a lot on the "what" and "how", but less on the "why" of a course. Whenever I teach, I want my students to look far beyond the short-term goal of passing a course or finishing a degree. "Why are we studying this course?" Answering this question will give them the sense of real purpose as to why a course is important for their future career and what positive impacts will it have in making the world a better place not only for them but also for other fellow human beings.

Know your students: It is human nature that different people tend to learn differently. One of the guiding principles of a teacher should be to acknowledge that a single pedagogical technique may not fit all. Recognizing the diversity and knowing what works for students, especially those who struggle, will eventually contribute positively toward enlightening more minds and preparing them for tackling more challenges.

First, get your theory right: Computer Science, for the most part, is a hands-on science. However, there lies a great deal of theoretical foundations rooted in mathematics, statistics, and other disciplines which call for getting your theory right and aiming for practical application of ideas. It is my belief that only when one succeeds in striking the right balance between theory and practice, one can claim to have meaningfully connected the dots of a puzzle.

Teaching and Mentoring Experience

My first exposure to teaching was when I was a senior in high school. I taught mathematics to my classmates as a tutorial to prepare for college entrance exams. While the first class was obviously stressful, I gradually took charge of subsequent sessions and later found out from my classmates that I helped them understand math better. That encouraging feedback led me to spare my time in helping others unlock their own potential toward becoming the best versions of themselves. After I joined college, I continued to mentor my juniors during semester breaks and witnessed that teaching is not only enjoyable but also rewarding.

After I graduated from college, I taught numerous undergraduate courses from introductory

computer science to programming, operating systems, compiler design, formal language theory, server-side web programming, and computer graphics. During my graduate studies, I have participated in mentoring of undergraduate computer science students at the University of Trento. In particular, I successfully mentored undergraduate theses on open source software quality metrics and web application configuration vulnerability analysis.

As a Postdoctoral Researcher at UIC, I have participated in giving guest-lectures and course project mentoring for a graduate-level course "Advanced and Persistent Threats" in the winter of 2016. Since 2014, I have mentored both undergraduate and graduate students on senior projects, summer internships, and master's thesis and projects. The areas I covered span web security, cyber-crime analysis, and malware detection. All the students I mentored have successfully completed their respective projects and secured industry positions in cybersecurity.

Teaching Interest and Plan

I would like to teach courses at both the graduate and undergraduate levels. At the undergraduate level, my teaching interest broadly covers systems area courses (e.g., operating systems, systems programming, compilers and automata, distributed systems), programming (structured, object-oriented, scripting), data structures and algorithms, and foundational security courses. At the graduate level, I can teach a wide range of security-related courses from introductory cybersecurity to advanced courses on secure systems design, web security, mobile security, cloud security, malware analysis, and emerging topics in cybersecurity such as security and privacy issues in the Internet of Things. In addition, I plan to design and execute two graduate-level courses:

Data-Driven Cybersecurity: I believe the explosive growth in data generated from systems and services is an unexplored arena from which actionable security insights could be systematically inferred. To do so, a methodical approach needs to be in place to leverage multi-disciplinary insights on data representation, sensing, acquisition, cleaning, analytics, and visualization. Machine learning and other security-relevant data analytics techniques are among the crucial components of the course, along with scalability and performance of data-driven cybersecurity systems.

Adversary-Aware Cybersecurity: I believe cybersecurity should be taught in a manner that mirrors the understanding of adversarial motives and tactics. Only when students grasp the attacker point of view that they will creatively envision effective defense and ethical offense if need be. One of the skill gaps in the industry is the lack of hands-on graduates in cybersecurity. Similarly, in graduate research, students come from varying background on hands-on cybersecurity principles and practices. I believe this introductory but at the same time hands-on course will serve as a springboard for undergraduates heading for industry and graduates aiming for research.

On top of all these, I will gladly continue to encourage undergraduate and graduate students in gaining solid research skills and industry exposures so as to prepare them to the often unpredictable career and threat landscape in the real world. I would certainly volunteer to serve on various departmental committees that would advance the quality of services rendered to students and the public at large.