# TEACHING STATEMENT

In the past, I have taught students as a teaching assistant, a guest lecturer and a cybersecurity trainer. I am looking forward to more teaching opportunities ahead of me. In fact, when I dream of my future as a faculty member, the most joyful part of this dream is to share the exciting research findings of my own and others' with my students, and increase their love for the field of cybersecurity and computer science in general.

## Recent Teaching Experience

I worked as a teaching assistant four times for a class called "Software Vulnerabilities and Security". It was a medium size graduate-level class with about 60 students, some of whom were undergraduates. This class was meant to teach common vulnerabilities found in operating systems and web applications, and give them a set of skills to exploit these vulnerabilities. I held weekly office hours to help students understand the concepts better and overcome difficulties in their assignments. I designed exams, some of which had hands-on problems such as the reverse engineering of a program binary, and also participated in the grading process. I also helped students to find ideas for their class projects and mentored them along the way.

While I was a teaching assistant, I was also invited to give a guest lecture about common security threats against the Web, including the ones my research had found. To help the students learn the material easily and effectively, and also to make the teaching process more engaging, as I usually do, I used many visuals such as diagrams and animations. I noticed that they were more engaged with the parts of the material I explained visually. I also noticed how their attention increased when I introduced a new class of vulnerability and the research of mine about these vulnerabilities. On one hand, it was more interesting for them as it was new, and on the other hand, it was the findings of somebody who they can relate to. This reinforced my belief that the teaching materials should be continuously enriched by the latest research. This continuous enrichment familiarizes students with academic research and increases their interest and appreciation of research. In addition, it helps the class materials stay fresh.

## Past Teaching Experience

I worked for a private cybersecurity company as a penetration tester for about three years before starting my PhD education. Occasionally, I would be asked to give lectures to the rest of the team on certain topics such as exploit development and malware analysis. Since both I and they enjoyed these sessions, the company decided to offer a new service to other companies which essentially was an offensive security training for security engineers in those companies, and they asked me to create the training materials and teach them. I developed the course and taught it to groups of sizes ranging from 5 to 25. The course covered the major steps of penetration testing such as reconnaissance, scanning, vulnerability search and exploitation.

While developing the course I put serious effort into creating a hands-on exercise for every technique I cover in the course. In addition to my demonstration of those techniques on a big screen, they were also able to follow the steps on their own laptops. Thanks to the hands-on exercises, students were more engaged and had an easier time understanding the concepts, while I had a smoother experience teaching the course.

## Mentoring

I have always found it exciting and rewarding to find interesting research questions that are interesting to me and to someone with less research experience, and to mentor and help them find answers to those questions. I have had successful mentorship experience with two students, Ali Akhavani and Cem Topcuoglu.

Ali decided to take on a research problem which was not similar to any research he had done before. I pointed him to useful resources on the topic and supported him continuously while he was designing and conducting the experiments. Currently, I am helping him with planning and writing the paper to share our exciting findings with the world. Cem was also new to the topic of the research we did together. We met twice a week regularly where I encouraged him to take initiatives and gave him ideas about the experiment design

and the solutions of technical challenges he was facing. I also helped him to better communicate the results of his experiments in the weekly meetings with the entire team. I am happy to see that he was able to get his first top-tier security conference paper out of this project.

## Example Courses

I can teach courses at the undergraduate and graduate level within cybersecurity and more broadly within computer science. I plan to leverage my expertise and experience from my industry work as a penetration tester and the latest research of my own and others' on the relevant topics to design engaging computer security courses. Also, I am eager to transfer my expertise on the analysis of cybersecurity data from which I have immensely benefited, to my students who are possibly researchers or analysts of the future. Finally, I would like to design a course about how biological systems are solving computer science problems by building on top of my work at Cold Spring Harbor Laboratory where I studied the immune system and viruses to find solutions to the cybersecurity problems. Below, I describe some example courses I would like to design and teach.

**Network Security.** A course on how and what security threats arise in the networked systems.

**Offensive Security.** A course teaching students red team skills such as scanning, exploiting, gaining and maintaining access.

**Data Analysis for Cybersecurity.** A course for giving much needed skills for sifting through large volumes of cybersecurity data, gleaning insights and communicating them through visuals.

**Algorithms in Nature.** A course on how biological systems such as bacteria, insects and organ systems solve the same problems we face in computer science.