Mohannad Alhanahnah – Teaching Statement

Very few things enlighten and reward like the experience of teaching. My teaching assignments have improved my knowledge and improved my ability to convey knowledge. I have found that I enjoy helping students grow and improve their skills to achieve their future goals.

1 Teaching Experience

My first taste of teaching was during my undergraduate studies when I would attempt to explain networking and programming concepts to my classmates. This early experience paved the way for me to become a part-time trainer after finishing my undergraduate degree. In that role, I delivered several industrial courses, such as Security +, Network +, and CCNP Security, which involved designing the curriculum and preparing materials and labs for these courses. At Birmingham City University, I was a teaching assistant and later became a Cisco certified trainer to deliver Cisco courses. My teaching duties included giving lectures and instructing lab sessions, preparing and designing course material, correcting assignments and exams, holding office hours, and guiding students through class projects. In my Ph.D., I was invited by my advisor Dr. Hamid Bagheri as a guest lecturer to deliver several lectures on Android and IoT security in the course CSCE 461/861: Secure Software Engineering. This teaching experience was very insightful because this class contains graduate and undergraduate students. The main two insights are: (1) the need to provide sufficient background before diving into the topic due to the diversity of students in the class, and (2) I need to simplify some security concepts. To convey these concepts meaningfully, I presented different examples or abstractions from real systems. I observed that the students were more engaged in practical demonstrations of contemporary technologies. This has informed my belief that laboratory-style illustrations of theory in practice are excellent vehicles for teaching fundamental ideas and skills.

2 Teaching philosophy

Teaching constitutes a vital component of the scholastic profession. I believe a teacher should be able to excite the students about the subject matter. I like to use analogies from real life to get undergraduate students engaged in my courses. Therefore, connecting students with the real-world will lead to greater interest and deeper learning. As innovative researchers, one of our main responsibilities is to instill in students what we acquired from our research. Teaching aims to assist students in assimilating new technical topics, but also impart a new world of ideas, critical thinking, and enduring problem-solving skills. To achieve these goals, I maintain different themes for teaching graduate and undergraduate courses, which are the following:

2.1 Undergraduate Teaching

This theme involves providing theoretical underpinnings along with practical aspects of the concept. This approach should foster independent thinking and keep students engaged. It is also vital to introduce students to best practices and principles to avoid making trivial mistakes when they go into the industry. For example, in their first system security course, I will teach students how to avoid buffer overflow vulnerabilities to protect customer data.

2.2 Graduate Teaching

Graduate teaching involves two types of classes (1) seminar classes and (2) classes that combine grad and undergrad students. From my experience in the latter, the materials should satisfy different categories of audiences. For example, through the guest lectures that I delivered, I noticed that grad students have the tendency to try the demo. They are also interested in seeing more than one example. Furthermore, graduate students who are actively working on research will ask for references about information mentioned in the lecture. From my own education experience in graduate seminar classes, it is important to train students to review published papers and identify their strengths and weaknesses. As a prerequisite skill, students need to learn how to read an academic paper. Finally, I would like students in their review to think beyond strengths and weaknesses by answering questions (known as Heilmeier Catechism [1]) crafted by George H. Heilmeier, a former DARPA director.

2.3 Mentoring Students

Advising graduate and undergraduate students is another major component of our scholarly lives. Students have different strengths and weaknesses. Understanding these strengths and weaknesses and mentoring them according to their needs is crucial. As mentors, our responsibilities are to advise them on researching and writing research papers, as well as to help them develop professionally into notable scholars. For example, I noticed that encouraging students to participate and present in weekly group meetings will help them define their research interests and help them communicate their ideas. One of my mentees decided to do Ph.D. and after receiving his admission letter he sent me this feedback "*Thank you for being a great mentor and showing me the ropes to research. You will always be a fundamental keystone in whatever career I pursue, by being my very first boss. I really do appreciate all that you have done and our time working together.*" I would like to be an advisor who mentors students at all stages of their education and research and give them constructive feedback as needed. Moreover, I am also excited to engage with students in technical implementations as opposed to observing informalities.

3 Courses I can teach

I would like to offer the Software Supply Chain course. This course will be motivated by analyzing Log4j and SolarWinds incidents. It then introduces students to regulation concepts in this domain, such as Software Bill of Materials (SBOM) and emergent technical concepts like DevOps (Continuous Integration and Continuous Delivery known as CI/CD). This course will also describe industry tools (e.g.,

[1] https://www.darpa.mil/work-with-us/heilmeier-catechism

OWASP dependency check) for identifying software supply chain dependencies. All things considered, I would be happy to adapt my teaching focus to additional courses based on the needs of the Division of Science. Finally, I am interested in involving students in non-academic activities by establishing Capture The Flag (CTF) team for interested students