FADEL ADIB

TEACHING STATEMENT

Teaching has always been an area of immense importance for me, and I have been fortunate to experience it as an instructor, mentor, and community service volunteer. While teaching scientific and engineering concepts, my goal is to ignite students’ passions about the intellectual rigor of problems and to empower them with a creative yet principled approach in tackling challenges. Through my teaching experiences, I have come to realize that we can galvanize our students’ interests by relating the material to students’ experiences and everyday lives. In doing so, we can create a personal connection between students and the concepts they are learning, and encourage them to pursue these concepts through their own personal and creative journeys.

Teaching: I started to develop my passion for teaching through my volunteer tutoring experiences during middle school. This passion grew during high school, when my computer science instructor entrusted me in substituting for her, knowing that I could help my classmates in understanding complex concepts by relating them to other courses like math and physics.

My first encounter with teaching at MIT was as a guest lecturer in a course my advisor (Dina Katabi) was teaching on Wireless Communication Systems during 2013. Later, in Fall 2014, I was fortunate to serve as a teaching assistant to the core graduate Computer Networks class. The class had 45 students and covered the entire networking stack, from the physical layer to the application layer. I was responsible for conducting recitations and review sessions, co-designing and grading exams and problem sets, and holding office hours. Because of the complex nature of modern computer networks, students oftentimes struggled to understand how a particular component fit into the bigger picture. In trying to help them, I realized that regularly returning to a top-down analysis was immensely valuable. For example, in one of the review sessions, I drew the different components of an end-to-end wireless communication system on the board, then delved into each of the components through examples, before piecing them back together. More than once, students became particularly excited about exploring certain components at greater depth either to quench their curiosity or to advance their research projects. I would also spend one or two hours after class to answer their questions.

Throughout the course, I also guided students with their class projects and worked closely with them as they gained first-hand experience in building networked systems. At the same time, as a student myself, I understood their frustration with getting systems projects to just “work”. I shared with them my own experiences of spending hours to debug trivial problems, then demonstrated the systematic approach I developed throughout my research for identifying root causes of systems problems. In their anonymous course evaluations, students said they felt I was “extremely knowledgeable and approachable” and “very patient and always available”, and that my “explanations during office hours were very clear and sharp.” Furthermore, some of the projects led to papers in top networking conferences like SIGCOMM and NSDI.

Mentoring: As a senior graduate student at MIT, my advisor paired me as a mentor with incoming undergraduate and graduate students, oftentimes giving me the privilege to lead projects with multiple junior students. Throughout all my mentoring experiences, my first goal had always been to marry the project with concepts that excited my mentees technically or personally. For example, when Hongzi Mao interned in our group as an undergraduate, he was excited about software systems’ research, so I carved out tasks in our RF-based heart rate monitoring project that focused on building the system architecture for real-time monitoring. Eventually, Hongzi developed a sense of attachment to the project and he spent sleepless nights perfecting it before our MobiCom ’14 demo, which won the best demo award. Hongzi later got admitted to MIT as a PhD student. My experience mentoring Zach Kabelac took a different angle. Zach joined our group as an undergrad. His original plan was to leave with an MEng and join a hardware company. I worked with Zach on the design and implementation of the hardware for a research project called WiTrack. I also taught Zach how to code in C and MATLAB, and we designed together new algorithms for RF-based localization. Zach received the best MEng thesis award for his contributions to the WiTrack hardware and signal processing algorithms. He also changed his mind and decided to join MIT as a graduate student and is currently working on his PhD.

Courses I can teach: Given my research and academic background, I am enthused to teach courses on computer networks, sensing systems, and wireless communications. I am also qualified to teach distributed systems and HCI, as well as introductory courses to computer systems, signals & systems, and algorithms.
Beyond these courses, I am excited about building on my research expertise to develop a new course on cyber-physical systems, with a particular focus on IoT applications. The course will be a hands-on project-oriented class that teaches how this emerging category of systems can sense and manipulate their environment. Lectures and labs would cover both system architectures and device designs and will touch on the new dimensions of security vulnerabilities for these systems. In addition, projects in the class will encompass various IoT applications such as smart homes, retail, and manufacturing.

Outreach & Community: I believe that our calling as educators expands beyond our classrooms and lab spaces. Because of that belief, I have taken part in initiatives to reach out to various sections of our community, from different educational levels and demographics. For example, to encourage undergraduate students to explore graduate school in computer science, I participated as a panelist in an NSF-sponsored workshop. The workshop brought together about 100 students from around the US – with a particular focus on underrepresented minorities and females – to encourage and help them in the application process. Furthermore, during undergrad, I volunteered in a UN-led computer-literacy project. As part of this project, we traveled to remote areas in Lebanon and taught municipal employees how to use computers. Additionally, to engage with wider audiences about the impact of science and technology on society, I presented and demoed my research at the MIT Family Weekend, Hour of Code, HubWeek, and TEDxAmherst.

I also believe in establishing collaborations and sharing ideas within the research community. In my research, I have collaborated with researchers in HCI, graphics, and robotics, in MIT and other universities. I also co-organized the Wireless@MIT seminar series. The seminar invites professors from top academic institutions around the world to give talks at MIT about their research on wireless and mobile computing and encourages collaboration between world-renowned researchers.

In conclusion, I believe that teaching carries with it an immense responsibility, yet it bears an invaluable reward. It allows us, as educators, to connect with our students at levels of profound intellectual depths, igniting their passions and inspiring in them a desire to contribute to their scientific fields and communities. Having adopted this philosophy, I am excited about my teaching and mentorship roles as a professor.