RAWAN ALHARBI | TEACHING STATEMENT

I believe that innovation and knowledge discovery should be directed to enhance our communities toward shared social values. Teaching allows me to transfer skills and knowledge to students, providing them with the proper tool of innovation in computing that can propagate positive social change within their communities. While at Northwestern University, I was fortunate to be selected for the year-long Teaching Certificate Program offered by the Sears Center for Advancing Learning & Teaching. The program helped me design a curriculum and then teach a course titled *Wireless and Mobile Health* (mHealth, COMP_SCI 397/497) offered to students in Northwestern University McCormick School of Engineering and Feinberg School of Medicine in Winter 2021. Moreover, I have designed and taught workshops about wearable and mobile computing to students with no computing background to enhance technical literacy and foster interdepartmental collaboration. I have also mentored many graduate and undergraduate students in the HABits Lab, where I work. These experiences have helped shape my philosophy of teaching and mentoring.

TEACHING PHILOSOPHY:

My teaching philosophy is grounded around four principles that guide how I instruct students in the class and how I mentor graduate and undergraduate researchers.

Enhance learning by scaffolding instruction. To ensure effective student learning in the classroom, I balance instruction with in-class activities that are carefully designed to assess students' understanding while promoting engagement and self-actualization. For example, at the start of each lecture, I design prompts and activities to uncover students' background knowledge. This helps mitigate any perceived bias or assumptions I might have, allowing me to tailor lessons around student feedback and interest. I also use in-class activities as a scaffolding method in information-dense lectures. For instance, when I explain the process of human activity recognition in mHealth, I find it helpful to pause after each step of the pipeline and divide students into small groups to work on subset problems that incorporate a wide range of activities such as experimenting with code, data collection, and visualization. These activities target developing critical skills around understanding when, how, and which computational method should be used. I also believe that instruction scaffolding is necessary while mentoring student researchers in the lab to ensure that the assigned task is challenging enough but not overwhelming.

Demystify research. Learning is not the passive absorption of knowledge but rather a process of knowledge discovery and production, emphasizing the importance of teaching research skills. However, usually research is thought of as a mystical process reserved for a lucky few, especially if the student did not grow up surrounded by researchers as role models. This creates a barrier, especially for marginalized and underrepresented students, to learn about and partake in scholarly endeavors, leading to a future of computing that represents the values and motivations of few. I believe that demystifying research will empower more students to believe that they can be researchers and innovators that participate and influence how and why we create some technologies. In my classes, I review and explain journals and conferences in various fields, including HCI and UbiComp. I provide resources on how to read and write technical computer science papers. Also, I guide students in writing a research paper in the class by defining multiple milestones in the quarter to help them write each section of the paper. I introduce them to the peer review process in which they learn how to critique existing papers constructively. I found that this process helped them learn how to propose a novel idea and clearly understand the type of work needed to support their ideas. At the end of the class, many undergraduate and graduate students joined our lab to learn more about research. I have continued to mentor and guide them through the process of academic research and publishing, resulting in 4 co-authored papers.

Facilitate different forms of participation. Interactivity and participation create engaging classrooms that facilitate the movement of ideas and learning. I encourage class interactions by incorporating different modes of engagement in the classroom to honor all capabilities beyond the ability to speak. For example, in addition to the in-class discussion, I encourage students to participate by collectively annotating the assigned readings, asking and answering questions, or upvoting another student's comment. Moreover, I encourage participation in designing the syllabus by allowing students a chance to select a topic that they are interested in exploring and present it in the classroom for further discussions.

Develop both critical consciousness and hope. Technology is not value-neutral; behind every choice we make in computing — as high level as what problem to solve to the low-level decisions related to data collection and

parameter tradeoff choice— is a human with specific values and interests. As a computer science educator, I believe that it is imperative to initiate critical discussions in the class about who our technology empowers and who it harms. While teaching, I do not create a separate unit in the syllabus to study ethics in computing, but instead I incorporate these discussions throughout the course. Overall, students appreciate regular discussions of the current and potential harm of computing as we investigate multiple topics throughout the semester. However, I also noticed that by bringing these valuable discussions, some students expressed helplessness and sadness. After consulting with other faculty and drawing from education literature, it appeared to be a common feeling that such discussion can bring. I then began emphasizing that these types of emotions are acceptable and are a part of making change, including examples of how alternatives can emerge from the recognition of these issues. Moving forward, I plan to cultivate a feeling of hope by bringing examples from history and from the present to illustrate how these complex issues can be worked through.

TEACHING INTERESTS:

As a Professor, I look forward to teaching both introductory and advanced courses. I am comfortable teaching a variety of subjects that intersect with my area, including Introduction to Programming, Data Structures, Applied Machine Learning, and Systems HCI. I am also very interested in developing courses (similar to the mHealth that I developed at Northwestern) more closely related to my research. These classes could span topics such as sensor data analytics, mobile systems, tinyML, and context computing in general.