SAAD AHMED **| TEACHING STATEMENT**

My motivation to pursue a tenure-track faculty position is driven not only by my passion for contributing to society with my research but also by the excitement of learning and improving myself by interacting with students from different backgrounds and interests. Courses and mentorship play a crucial role in providing learning and research opportunities that expose students to different topics that help them shape their interests. I am thrilled to create such opportunities through teaching and mentorship for my future students.

Teaching Philosophy

I am inspired by Einstein's philosophy on knowledge. He brilliantly explained, "Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world." I use this philosophy as I design my courses to enable students to develop curiosity, out-of-the-box thinking, and the ability to unlearn and relearn things which are key ingredients to address modern challenges and generate new knowledge, thus expanding the existing knowledge base of society.

Inspired by this teaching philosophy, there are three essential building blocks to constructing a course that would help students learn these points – *1) Inculcating Critical Thinking 2) Encourage Hands-on Learning. 3)Create an Open-minded classroom*. With a background in Computer Science and Embedded systems, I envision myself teaching a diverse range of undergraduate and graduate courses on topics such as internet-of-things, compiler construction, computer architecture, and real-time embedded systems. Using my research experience, I plan to design new courses at the intersection of machine learning, compilers, and embedded systems that will motivate the students to understand the problems and challenges in these areas while exciting them to apply their knowledge to solve them.

Inculcating Critical Thinking I believe thinking critically and seeking out multiple perspectives is critical to refining an idea and ensuring that every innovation positively impacts society. It helps develop curiosity that fuels the generation of new ideas. I was fortunate to have the opportunity to co-teach a graduate course, Internet of Things (IoT), at Northwestern University. I led the discussion on a research paper in each lecture and asked students to share their opinions on the strengths and weaknesses of the paper. The discussion enabled students to critically analyze a research idea and develop their understanding of the existing state-of-the-art in the IoT domain. One of the course deliverables asked students to come up with a research idea and analyze its feasibility thus helping them envision new research directions. The course helped students become good researchers, as mentioned by one of the students in his feedback. I have also used online learning platforms (such as Piazza) to encourage students to share their thoughts, ask questions, and share concerns. I look forward to continuing to develop innovative courses at (institution name) .

Encourage Hands-on Learning For curious ideas to materialize, it is crucial to actually implement the idea to explore its pros and cons to quantify its feasibility. During my graduate and undergraduate years, I designed in-class and lab exercises for my Introduction to the IoT class at LUMS that helped students understand tools and techniques for programming IoT devices. I have also designed lab manuals for students while serving as the lab instructor for the Operating Systems course at NUCES. It allowed students to put their concepts learned in class to practice by developing actual applications while giving feedback at the end of each session. I intend to continue my hands-on learning approach in the future and will design course assignments and projects to help students implement their ideas and enable them to apply their learning to see its outcome.

Create an Open-minded Classroom My goal is to enable critical thinking and hands-on learning experiences for students by providing an open-minded classroom environment that encourages new thoughts and fosters freedom of speech. Such an environment focuses more on students' capabilities and encourages a strengths-based approach to allow students to follow an idea/project around their core skillset while getting academic recognition. Open-minded classroom environment also makes cross-cultural interaction ordinary in the class-room and pushes students as well as instructors to engage with each other to share ideas and learn thus ensuring diversity, inclusion, and equity.

Lastly, teaching is an ever-evolving process. As a professor, I aim to continuously improve by learning new pedagogical techniques and tailoring my teaching materials and methods based on students' feedback.

Research Mentorship

As a mentor, I am inspired by the philosophy of Nico Habermann, who said, "You can produce the best research without producing the best students, but you cannot produce the best students without producing the best research."

Following this philosophy, the most important outcome of the research for me will not be the research itself but the person doing the research. As a mentor, I would like to focus more on the student as an individual to ensure the student develops the skills needed to become an independent researcher while being physically and mentally healthy. I will ensure that the student feels motivated enough to pursue the research goals. I aim to analyze my students' strengths and weaknesses to devise a winning strategy. Recently, I mentored a visiting PhD student from Ege University Turkey while his family was in Turkey. While it was tough for him to live away from family, I ensured he could achieve his research goals by helping him design programming support for a batteryless system. Our work was accepted at a top conference (EuroSys'23). I was ecstatic to hear that he will soon join the Georgia Institute of Technology as a Postdoctoral Researcher.

A research faculty member has many ideas to work on. I would teach my students to pick the ones that best suit their skills and align best with their career goals and objectives. At the same time, I like to be involved in implementing the system with my students as much as possible to help them understand the process of doing research while avoiding a roadblocker and refining their technical and non-technical skills. I want to cultivate a vibrant research environment with proper communication and active collaboration among team members. I have been fortunate to have mentored several undergraduate and graduate students, some of whom are pursuing their PhDs in the top universities of the U.S., e.g., Purdue, while some work in top companies such as NVIDIA and Amazon. I am fortunate to be able to play a positive role in my mentees' research journey.

My experience mentoring a diverse group of people has helped me learn the dynamics of mentor-mentee relationships while helping me develop man management skills. I look forward to guiding many more students by helping them understand their research interests while teaching them research methodologies so that they can become independent researchers in the future.