

Teaching Statement

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A key motivation for me pursuing an academic career is the enjoyment I find while teaching and mentoring students and fellow researchers. I view teaching as a noble profession with the opportunity to inspire students with ideas, foster a collaborative learning environment, and deepen my own understanding. Having been influenced by exceptional teachers during my own studies, I am committed to giving back to the community by sharing my knowledge and expertise.

Teaching Experience

My informal teaching journey began during my undergraduate years at BUET, Bangladesh, where I privately tutored around twenty students in mathematics, physics, and information technology over four years. These early experiences sharpened my skills in explaining concepts across varying levels of preparedness and built a foundation for my formal teaching roles.

Lecturer in UIU. After completing my undergraduate degree, I served as a lecturer in the Department of Computer Science at United International University (UIU), Bangladesh, for one semester. I taught two undergraduate courses:

- Numerical methods (undergraduate subject, 30 students), Fall, 2017.
- Data Communication (undergraduate subject, 30 students), Fall, 2017.

In this role, I designed the course syllabi, prepared and delivered lectures, assessed students through exams and assignments, and mentored them on semester-long projects. I particularly enjoyed adapting my teaching to students with varying levels of prior exposure and actively engaging them in problem-solving during tutorials. This experience gave me confidence in managing a classroom and strengthened my ability to tailor explanations to diverse audiences.

Teaching Assistant in NUS. During my PhD at the School of Computing, National University of Singapore (NUS), I served as a teaching assistant (TA) for six semesters across two undergraduate courses:

- CS2030: Programming Methodology II (Semester 1, 2018/19 to Semester 2, 2020/21). I developed automated scripts to assess Java programming assignments. These tools analyzed class structure and dependencies, enforced key object-oriented design principles (such as polymorphism), and checked for documentation quality using Javadoc. The scripts allowed for efficient grading and provided meaningful feedback to students and instructors. They have continued to be used in subsequent offerings of the course. This role taught me how to assess programming proficiency effectively while reinforcing good coding practices.
- CS3243: Introduction to Artificial Intelligence (Semester 1, 2020/21). I collaborated with fellow graduate students to help design course materials under the supervision of Prof. Kuldeep S. Meel. This involved coordinating the sequence of topics, preparing lecture materials, and structuring assignments to support progressive learning. Through this, I gained hands-on experience in curriculum development and in ensuring that students build conceptual understanding over time.

Tutorial/Lab Experience in UIU. Alongside lecture responsibilities, I also conducted laboratory sessions for the following undergraduate courses at UIU:

- Artificial Intelligence (undergraduate subject, 20 students), Fall, 2017.
- Microprocessor & Microcontroller (undergraduate subject, 15 students), Fall, 2017.

My lab responsibilities included demonstrating software algorithms, guiding students through hardware interfacing, and supervising experiments involving microcontrollers. These experiences deepened my practical understanding of computer science and highlighted the value of hands-on learning in reinforcing theoretical concepts.

Research Talk and Tutorials at International Conferences. I have had the opportunity to present my research at leading conferences in machine learning (ICLR, AAAI, IJCAI, ECAI, FAccT, AIES, CP) and databases (VLDB), as well as at prominent research institutions such as MPI-SWS in Germany, INRIA in France, Microsoft Research, the University of Michigan in Dearborn, and the SAT/SMT Winter School in India.

One particularly impactful experience was presenting a peer-reviewed tutorial titled [Auditing Bias of Machine Learning Algorithms: Tools and Overview](#) at IJCAI 2023. I prepared the tutorial proposal, developed the instructional content, and co-led the delivery. This strengthened my communication and teaching skills in a high-impact setting and deepened my appreciation for teaching as a means to distill and share complex research ideas.

Mentoring Experience

During my PhD and postdoctoral research, I have had the privilege of mentoring students across several institutions on diverse research projects. My mentoring philosophy is to be meaningfully active, supportive, and decisive, while leading students to their own success. I always appreciate the spread of joy when mentees succeed and thrive in their research pursuits. I aim to be neutral, encouraging, and inclusive, appreciating a meritocratic relationship between mentors and mentees.

- Lorenzo Ciampiconi, an exchange Master's student at NUS, worked with me on a MaxSAT-based formulation for the group testing problem. I guided him through the research process, from problem formulation to experimentation and writing. Our paper was accepted at AAAI 2020, and he successfully defended his Master's thesis based on our work. Supporting him through this process was an especially fulfilling experience.
- Mohimenul Kabir, a fellow PhD student at NUS, collaborated with me on the stream MaxSAT problem, which extended my prior work on MaxSAT-based incremental learning. I mentored him on formal modeling, algorithm design, experiment planning, and technical writing. Seeing his progress and confidence grow over time reaffirmed my commitment to mentoring.
- At MPI-SWS, I actively collaborate with fellow postdoctoral researchers, graduate students, and research assistants, including Till Speicher, Soumi Das, Qinyuan Wu, Mahasa Amani, Arijit Nag, and Mohammad Aflah Khan. Together, we explore various research topics in large language models such as learning and memorization, extracting and injecting knowledge, as well as assessing privacy risks and latent trust. As a senior researcher, I aim to set a positive example and foster a collaborative environment where junior researchers can thrive. Our recent papers accepted at ICLR 2025 and WSDM 2025 are outcomes of these ongoing collaborations.

Future Courses

I am well-qualified to teach a broad range of undergraduate and graduate courses, including **machine learning, artificial intelligence, probability and statistics, data structures and algorithms, and formal methods**. Based on my research expertise, I also plan to design a specialized course on **trustworthy machine learning**, covering topics such as fairness, interpretability, and foundational concepts of learning systems. This course would bridge classical foundations with cutting-edge developments in machine learning research.

To conclude, my teaching philosophy centers on introducing students to core principles of computer science while connecting them to current research challenges. I aim to foster an inclusive and interactive classroom environment. I encourage students to ask questions, explore ideas, and build intellectual confidence. Through both teaching and mentoring, I strive to instill technical rigor along with a mindset of curiosity, collaboration, and ethical responsibility.