Personal History Statement

In my country, many people believe that women are less likely to succeed in a challenging environment. I challenged this stereotype by joining a college cadet as a teenager, a path that very few women take. Although some doubted my ability to excel in such a rigorous environment, I exceeded expectations. I ranked among the top five students in the entire education board in my school years. I found that the higher the expectations placed on me, the more I thrived. This success solidified my ambition to become a distinguished academic scholar. Although I was offered a commissioned rank position in the army after mandatory participation in the ISSB selection process as a cadet, I chose to pursue my academic goals instead.

Despite being advised to pursue easier options, I successfully secured admission to the top engineering university in my country through an extremely competitive entrance exam, ranking among the top 100 out of more than 12,000 selected applicants nationwide. In recognition of my exceptional academic performance throughout my school years, I was awarded a full scholarship for my undergraduate studies. Driven by a strong desire to contribute to the digital infrastructure of my country, I chose computer science and engineering as my major. During my first semester, I faced a significant health challenge that affected my academic performance. However, I refused to let this setback define me and gradually became the top student in my class, achieving a perfect 4.00 GPA in my final semester. Along this journey, my resilience and determination helped me overcome every challenge, earning me the prestigious Dean's List Scholarship in my junior and senior years. While my academic record reflects my achievements, it may not fully capture the qualities that enabled me to transform a difficult start into a story of success.

From the very beginning of my undergraduate studies, I was driven by a desire to contribute to the betterment of humanity. When the COVID-19 pandemic struck and education shifted to online platforms, I, along with my teammates, developed an online educational platform, *e-Pathshala*, for the educational system of our country. Since all of our classes were conducted online during the pandemic and we were not well prepared for this transition, I also took the initiative to manage online classes for my classmates with the university's permission. There were internet connectivity challenges that could hinder the learning process otherwise. In my third year, I developed a hardware machine to assess the primary health conditions of COVID-19 patients, aiming to alleviate the burden on healthcare systems during the pandemic. In my final year, I built a hospital management platform to streamline operations for healthcare providers. This platform enabled hospitals to create accounts and offered functionalities such as appointment booking, ambulance requests, and health check-up management, ultimately improving the efficiency of healthcare services. Additionally, I developed a mobile application with my teammates, *ParkCar*, to address the parking space crisis in our country. This app not only helped optimize parking solutions but also provided a potential income source for landowners.

During my final year, I took a security course where I learned about various types of cyberattacks. Around the same time, the 2023 data breach on a Bangladesh Government website, which exposed the personal data of over 5 crore citizens, showed me how vulnerable digital systems can be. This shocking incident inspired me to take a deeper interest in solving digital security problems. For my thesis, I focused on automating manual code review tasks using large language models to make software developers' lives easier. While exploring the potential of LLMs, I discovered that LLMs can also generate malicious code if prompted with malicious inputs. This lesson made me realize the importance of building secure systems and motivated me to learn more. As a result, I joined a security-based research group, where we spent months reviewing literature. Eventually, I had the opportunity to collaborate on a project with a research officer from the National Research Council

(NRC) in Canada, focusing on APT detection from system logs. I have been working on this project for a few months now. As I got more involved in this research, I became more interested in doing a PhD in security. Meanwhile, we significantly surpassed the baseline model in our thesis work. I co-wrote a manuscript as the joint-first author detailing our findings, and it is currently under review for Mining Software Repositories 2025.

Before finalizing my goal, I applied my skills in various competitions and projects after taking a machine learning course in my final year. In a national-level competition, where multiple teams from reputed universities across Bangladesh participated, my team secured 8th place out of 100 teams. The competition focused on developing solutions that can be used for autonomous navigation in self-driving cars in the context of Bangladesh traffic. Additionally, I worked on a research project for WARPO under the Ministry of Water Resources, Bangladesh, where we predicted ground level water to install deep tube wells for pure water. Also, I developed a project using image style transfer to transform landscapes into paintings, since I was involved with art and music from my childhood.

Beyond my academic and research pursuits, I have actively participated in extracurricular activities. I served as a member of the IEEE Computer Society BUET Student Branch Chapter for two years, where I contributed to organizing national-level competitions, career talks, research seminars, and software development workshops. I also mentored high school students during my undergraduate studies and managed to cover my monthly bills using the payment I received. During this time, I also worked as a machine learning intern at a reputed company, where I worked on developing an Android app for client-side verification of National ID card images. After graduation, I joined as a full-time lecturer at a reputed university in Bangladesh, the Canadian University of Bangladesh. This opportunity provided me with a platform to interact with people from diverse backgrounds, for which I am immensely grateful. Although I officially joined on July 16th, my start was postponed due to the student protests during the July Revolution in Bangladesh. Since then, I have been working here for about four months, guiding undergraduate students through teaching and project supervision. I also assist them in making informed decisions about their courses through course advising.

For non-departmental activities, I studied music at Bangladesh Shishu Academy, Chittagong, for four years in my childhood and performed in cultural programs. I play the harmonium professionally, as well as the keyboard and kalimba. Beyond music, I enjoy writing and visual arts, and one of my Bengali journals won an award in 2017 on International Mother Language Day. I also work with Photoshop and Adobe Illustrator. In addition, I am multilingual, fluent in Hindi, and have an intermediate proficiency in the German language.

While I have achieved many accomplishments throughout my life, my academic journey has not always been smooth. I faced several external challenges, such as during my first semester when the tragic death of a senior at our university sparked widespread protests, resulting in the closure of the university for an entire semester. Additionally, the COVID-19 pandemic had a significant impact on my studies, extending my undergraduate program to five years. Moreover, the nationwide revolution in July 2024 caused further delays. However, I believe all these life experiences have helped me grow and mature.

I believe all my experiences have shaped me into the person I am today. I am now ready to apply my knowledge and skills to advanced research, embracing the challenging yet rewarding path of a PhD. I am eager to contribute further to the service of humankind through meaningful work.