Statement of Purpose

As an eager mind who loves to explore the future roles of Computer Science towards technology, I have a predilection to grab any opportunity that involves research regarding the burgeoning of it. Real-Time Embedded System is such a branch of Computer Science that has the potential to play a big role in technological advancements of diverse areas like automotive, energy, healthcare, manufacturing and transportation etc. Being one of the most significant domains of Computer Science, this field has given me the impetus to pursue Ph.D. in this field. Besides I have a keen interest in the areas like System Security, Fault Tolerance and Cyber Security. I believe graduate education in the department of Computer Science of George Mason University can provide me an everlasting experience that will be significant enough to sustain my passion as a researcher. Having a strong affiliation with the industry, I think this is the perfect place to get acquainted to the cutting edge technologies in parallel to state-of-the-art research. Several years from now, I picture myself as a faculty in a reputed university or as an extensive researcher in institutes like Google, Microsoft or Bell Labs to make a real difference on latest problems in the fields.

Back in the year 2009 after completing my higher secondary education it was a tough call for me to choose my career between defense and engineering since I got selected for both. As I completed my secondary and higher secondary education from cadet college, my family members expected me to join the defense force but my interest in science dates back from school. So, I listened to my mind and chose to pursue my career in engineering. And the foundation of my dream was first laid on at the department of Computer Science and Engineering (CSE) at Islamic University of Technology (IUT), one of the leading engineering universities in Bangladesh. Only few students holding highest quality result get the chance to study in this university after a very competitive admission test. In an environment that is intensely vying where research goes hand-in-hand with learning, I had the opportunity to engage myself in both theoretical research work and implementation, thus laying a sound foundation for graduate study. I was ranked first in a class of 47 in my undergraduate study with a CGPA of 4.00 out of 4.00 and received IUT Gold Medal for my academic excellence.

During my undergraduate studies, I found keen interest in subjects like Algorithm, Data Structures, System Programming and Security, Machine Learning, Data and Telecommunications, Communication Engineering, Wireless Networks, Database Management Systems, Relational Database Programming, Artificial Intelligence and Expert Systems. I was surprised by the vastness of computer networks and how it has brought the whole world under one umbrella, especially wireless network that has given birth to the concept of mobile users and portable devices. The generation where mobile phones, laptops and tabs have replaced the usage of desktop computers, concentrating on the further development of wireless network is a must. From that realization, I decided to do my Bachelor's thesis on 'Rate Adaptation' in wireless networks. I developed a rate adaptation algorithm that outperformed most of the existing algorithms. During this time I got deeply involved in 'ns-3' simulator where I had to modify the kernel to incorporate my own algorithm.

My supervisor, being a very passionate researcher taught me how to spend committed hours going through reputed Journal and Conference publications. After months of laboring I eventually realized how meaningful a career in research could be. At the end of the year, my thesis was well received by the panel of professors and I obtained highest grade for my thesis. Later, my thesis was published in IUT Journal of Engineering and Technology.

Upon my graduation, I was offered to join as a lecturer at the same university in December 2013. As part of my teaching responsibilities, I have conducted several courses like Fundamentals of Computers, Communication Engineering, Mathematical and Statistical Analysis. I have also conducted labs on RDBMS Programming, Computer Networks, Internet Engineering, Wireless Networks, Software Development, Artificial Intelligence and Expert Systems, Simulation Modeling and Performance Evaluation. Besides, I supervised two undergraduate project groups. In addition to that, I also co-supervised one undergraduate thesis group on data mining. Manuscript of our work is under preparation and will be submitted to a reputed conference very soon. Other than my official responsibilities I also mentored several junior year students who became champion in various application development contests in national level.

In parallel to my teaching profession I also completed my Master's degree from IUT. My Master's thesis work is an extension of my bachelor's thesis. I addressed the stale feedback problem prevalent in many rate adaptation algorithms and provided a novel approach to overcome it. This time also my proposed algorithm showed better performance compared to the existing ones. My thesis was well appreciated by the dissertation committee and I completed my Master's degree in November 2015 with a CGPA of 4.00 out of 4.00. The manuscript for the journal version of my thesis is under preparation and will be submitted to a reputed journal very soon.

Besides, I have started collaboration with professors from Canada this summer. So far we have completed one project on RFID networks. We developed a redundant reader elimination algorithm that gives minimum number of readers required to cover all the tags available. The performance of our algorithm was very promising compared to other prevalent ones. I also developed a simulator in python for this purpose. We submitted our work to an IEEE conference, which is currently under review.

Apart from academics and research, I have always been involved in co-curricular and extra-curricular activities since my childhood. In my primary school life, I led my own school team in National Scout Jamboree as a team leader. During my tenure at Cadet College, I participated in Inter House Debating Competitions, Cricket and Football tournaments. I was also appointed as House Cultural Prefect as a certification of my leadership and co-curricular skills. In my sophomore year of university, I was elected as the member secretary of IUT Computer Society that organizes the nation's biggest ICT festival every year. In the following years I worked as one of the organizing committee members of ICT fest. Besides, in my senior year of university I led the CSE department Cricket and Volleyball team as captain and vice-captain respectively. I believe all these experiences have helped me to develop my organizational and interpersonal skills.

The department of Computer Science of George Mason University offers wonderful opportunities to researchers interested in Real-Time Embedded Systems, Fault Tolerance, System Security and Cyber Security. I believe, with the extensive and detailed course work, conglomeration of highly capable professors and avant-garde research facilities, George Mason University gives me the perfect platform to exercise and excel in my research endeavors as well as to equip me with knowledge and expertise to pursue a career in academia and research.