**Statement of Purpose**

As an eager mind who loves to explore the future roles of computer science and technology towards human life, I have a predilection to grab any opportunity that involves research regarding the burgeoning of it. Cyber-physical System (CPS) is such a branch of computer science that deals with the collaboration of computational elements with the physical entities thereby building a network of interacting elements with physical input and output instead of standalone devices. Being a very recent yet significant domain of computer science, this field has given me the impetus to pursue Ph.D. in this field. I believe graduate education in the Electrical Engineering and Computer Science department of University of California Irvine can provide me an everlasting experience that will be significant enough to sustain my passion as an academic. Having a strong affiliation with the industry, I think this is the perfect place to get acquainted with the cutting edge technologies in parallel to state-of-the-art research.

Back in the year 2009 after completing my higher secondary education it was a tough call for me to choose my career between defence and engineering since i got selected for both. As i passed out from cadet college my family members expected me to join the defence force but my interest in science dates back from school. So, I listened to my mind and choosed 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 can 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 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, Data and Telecommunications, Communication Engineering, Wireless Networks, Database Management Systems, Relational Database Programming, System Programming and Security, Machine Learning, Artificial Intelligence and Expert Systems. A broad range of programming languages enabled me to apply the learned algorithms while solving different problems related to my project and research works. 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 desktop computers, concentrating on the further development of wireless network is a must. With that realization, I decided to do my bachelor 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 it to incorporate my own algorithm.

Research for my thesis required me to spend committed hours on many published papers on the respective field. I would go through the papers over and over again until I realized the core objective of the authors, the proposed algorithm for the problem and the design of the solution. Involving myself in such devotion helps me find the shortcomings of the solutions and thus come up with new improved ideas towards a particular problem. Finding solution of a real world problem gives me immense pleasure and an experience of satisfaction of achieving something as a person. Overall, my thesis helped me 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 a journal.

Upon my graduation, securing the 1st position in a highly competitive class of 47, 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. Besides 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. Our work has been submitted to an international conference and currently under review. Moreover, other than my official responsibilities I also mentored several junior year students who became champion in various application development contests in national level.

After joining as a lecturer, I started my Master’s degree at IUT at the same time. My Master’s thesis work is an extension of my bachelor’s thesis where I addressed another problem of existing rate adaptation algorithms and provided a novel solution to overcome it. This time also my proposed algorithm showed better results 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 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 on an IEEE conference which is currently under review.

Apart from academics and research, I have been involved in co-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 which organizes the nation’s biggest ICT fest every year. In following years I worked as organizing committee member of ICT fest. Besides, I also participated in Inter Departmental Cricket and Volleyball Competitions throughout my university years. I played as a Captain and Vice-Captain of departmental Cricket and Volleyball team respectively in my senior year. I believe all these experiences have helped me to develop my organizational and interpersonal skills.

The department of Electrical Engineering and Computer Science of UCI offers wonderful opportunities to researchers interested in Cyber-physical System (CPS). I am particularly interested in working with **Prof. Mohammad Al Faruque** in his **Advanced Integrated Cyber Physical Systems (AICPS)** lab where **Cyber-physical Energy Systems (CPES)** are developed. **Energy management-as-a-service**, **CPS security** all these coincide well with my research interest. I believe, with the extensive and detailed course work, conglomeration of highly capable professors and avant-garde research facilities, UCI gives me the perfect platform to exercise and excel in my research endeavors as well as equip me with knowledge and expertise to pursue a career in academia and research.