

Statement of Purpose

It was a chilly winter morning when I first stepped into my university, very excited, as I had the opportunity to do my undergraduate in Computer Science and Engineering. It was something which I have always wanted to do. Since my father was an electrical engineer, I grew up in an environment full of tools and electrical and electronic equipment. I used to watch my dad with awe working on circuits and fixing things. He introduced me to computer and taught me how to use it. He showed me different hardware components and how to assemble them. As I grew up using computer, I was so amazed and fascinated by it that I aspired to become a graduate in Computer Science.

My dream of becoming a graduate in Computer Science turned into reality when I got an opportunity to be admitted in the department of Computer Science and Engineering at Islamic University of Technology (IUT), one of the leading universities in Bangladesh. The admission process of IUT is extremely rigorous. Several thousands of students having top results in secondary and higher secondary exams apply here. Only about 250 students are selected for admission after a highly competitive admission test. Throughout my undergraduate studies I was put through intense academic pressure, having to take 181.5 credits. Despite the workload I successfully completed my undergraduate studies, securing second position in a highly competitive class of 47.

I would be mendacious if I say that I expected to be interested in fields like Computer Vision and Machine Learning when I started my undergraduate studies. However, as I had the opportunity to be closely acquainted with these fields later on, I found them so intriguing and nuanced that I made up my mind in building my career and conduct research in these fields. Years from now, I envision myself as a researcher in institutes that work on Computer Vision and Machine Learning so that I can make my own contribution to Computer Science.

During my undergraduate studies, I found keen interest in subjects like Algorithm, Machine Learning, Artificial Intelligence and Image Processing. I remember the excitement of learning new algorithms and implementing them to solve complex problems. When I was introduced to the course of Machine Learning in my junior years, I was deeply motivated by its underlying idea that computers can be made to “learn” things. It was amazing to see how the algorithms applied in AI and Machine Learning could give rise to the impression that the machines are intelligent and can logically respond to inputs. Later on, when I came across the course of Image Processing, I felt totally immersed into it and it drove me to explore further and work on it. Besides these, a wide range of programming and database management system courses provided me a firsthand learning experience on application development. I did several academic projects throughout my undergraduate studies which helped me not only in improving my development skills but also allowed me to have a deeper understanding of the respective courses. All of my projects were highly appreciated by the course instructors and earned me highest grades.

I elected to do my bachelor thesis in Medical Image Processing. I proposed a method for automatically detecting lung tumors from the CT images of lungs using textural features with a preprocessing step that segments the lung parenchyma region. During my undergraduate thesis I came to know about Computer Vision, a field that intertwines Machine Learning and Image Processing. My thesis required the application of Computer Vision because classifying tumorous regions from CT images needed the system to learn. For my thesis, I had to dedicate significant time studying acclaimed publications in the fields related to my work. I thoroughly analyzed the

proposed solutions while at the same time explored the methods and algorithms that are commonly applied in Medical Image Processing and Computer Vision. After months of hard work I was able to come up with my own idea. My thesis was well appreciated by the panel of professors to whom I defended it and I obtained the highest grade. Recently, my work has been accepted for publication in International Workshop on Feature Similarity and Learning for Computer Vision, in conjunction with 12th Asian Conference on Computer Vision 2014 (ACCV 2014). My undergraduate thesis helped me in realizing how meaningful a career in research can be and taught me how to conduct research properly while improving my domain knowledge.

Besides my academics, I was also one of the executive members of the IUT Computer Society which organizes National ICT fest every year. Students from different universities all over the country come and participate in different ICT based contests. I was in charge of managing the programming contest and IT Business Idea contest in the fest held in 2013. This experience helped me to develop my organizational and interpersonal relationship skills. Alongside these, I actively participated in several programming contests during my undergraduate studies which helped a lot in my logic development. I was a member of the team that became champion in IUT Inter Departmental Programming Contest in 2012. I also participated in National ICPC in the same year.

After completing my Bachelor's degree, I joined Islamic University of Technology (IUT) as a lecturer in December 2013. I have conducted courses on Numerical Analysis and Database Management Systems and the corresponding labs. I have also conducted labs on Database Concepts and Programming, Office Automation, Visual Programming and Pattern Recognition. Career in teaching has helped me to learn how to express complex ideas in a simple manner so that it is easy for the students to understand. It has provided me valuable experience in teaching and allowed me a glaring opportunity to be in an environment that is congenial to research.

To fulfill my dreams of building a career in research, I decided to pursue graduate studies from a reputed institution. This search eventually led me to consider the graduate program at Stony Brook University. I am well aware that Stony Brook University is a top institute and one of the best centers for research and innovations. My top priority is Computer Vision because it is close to the field in which I have done my Bachelor thesis and have the most experience in research. Having carefully gone through the research works performed in the "Image Analysis Lab", I found the projects on "Computer Vision for Human Vision Modelling" and on "Machine Learning for Brain" very intriguing. My second field of preference is Machine Learning and Artificial Intelligence because of my inclination towards these fields and their close connection to Computer Vision. Despite my lack of experience of doing research in Machine Learning I am optimistic that with my hard work I can make up for it.

I know that admission into Stony Brook University is intensely competitive. Yet I would like to consider myself as a potential candidate for the program because of my enthusiasm and zeal in conducting research, tenacity towards solving a problem and eagerness to work hard. I believe that working under some of the finest minds in Computer Science over here would allow me to enhance my knowledge and help me to conduct meaningful research and thereby build a successful career. I hope that my credentials will be suitable to enroll into the highly reputed PhD. in Computer Science program, at Stony Brook University.