Statement of Purpose

S M Rafiuddin *Ph.D. Applicant*

To predict the future for the field of technology is merely an impossible task. What will happen a hundred years from now will be a quixotic task to imagine. But from the prospect of present technological dynamics, I can assume that the next decades will be the time of advancing Machine Learning in the field of Computer Science and as well as Genetic Engineering. I am a Computer Science graduate willing to pursue a Ph.D. in Computer Science / Information Systems, fascinated with the upcoming advancements in this field of technology. It will be an adventure to be a part of this revolution in the field of Computer Science and learn its theoretical and practical aspects. I believe, pursuing a Ph.D. is the best option to be a part of this revolution.

As I have the experience of conducting some undergrad courses in the Computer Science discipline at the University of Asia Pacific, I think it would help me to become a good researcher in the future. To be in the teaching profession, I had to be always innovative in making new problem sets, evaluate students, and give guidance and motivations according to their potentials. I enjoyed the challenge of this profession because, in this profession of teaching, I had to be always in a process of updating myself. I had to be always slightly better today than yesterday and always better tomorrow than today.

In the teaching profession, I conducted the course and lab entitles "Pattern Recognition", and this course is very much research-oriented and I enjoyed the teaching of this course very much. I updated this course with the recent advancement of this field with the help of consultation from the senior faculty members of the university. I have learned some new interesting stuff from this course as well e.g. Generative Adversarial Networks, Lagrange Multiplier method, etc.

In the four years of my undergrad education, I have done three projects. The first project entitles Applet Scientific Calculator using Java programming language. It has all the computing abilities to calculate big multiplication and factorial. It was based on various number theory algorithms that I've learned throughout the first year of my programming courses.

My second project was based on Online Automatic Question Answering using Semantic Parsing and Lambda Calculus. It was my first project based on some reading of research papers on Natural Language Processing. This project would take any questions and parse them semantically, then answer the question based on learning experience as well as knowledge base database implemented in the Python 3 programming language. My third project was on Anomaly Detection of an Algorithm's output result using various supervised machine learning approaches. It was also implemented via Python 3.

In the early years of my undergraduate studies, I mainly focused to build a strong foundation on Data Structures and Algorithms. I solved various Competitive Programming problems on various online-judge sites such as LightOJ, UVa Online Judge, and later on Code Force. I took part in various National Collegiate Programming Contest for the first three consecutive years. In the final year, I concentrated on my undergrad research. The research is based on the performance analysis of various supervised machine learning algorithms for the text classification process in Natural Language Processing. This research later got accepted in 19th International Conference on Computer, Information, and Technology, 2016, and got 14 citations so far according to google scholar.

My research interest is related to Machine Learning and its theoretical and mathematical model as well as the advancement to its practical applications. I am willing to take part in research that involves building any sophisticated Machine Learning model and its application.

To build a strong foundation on machine learning, I completed two MOOC course entitles "Machine Learning" and "Design and Analysis of Algorithms Part I" course in Coursera offered by Stanford University.

Currently, I'm working on a project based on detecting Complex Bengali Handwriting Recognition using the Deep Learning technique and Abstract Art Generation using Generative Adversarial Network.

I choose the New Jersey Institute of Technology for pursuing my Ph.D. for several reasons. The Information System department curriculum at the Postgraduate level of this university is very much praiseworthy. I found that this university has several faculty members whose research activities are aligned with my research interest. I contacted Dr. Tomer Weiss in this regard and he encouraged me to apply. His research aligns with my interest and I am very passionate to join as a member of his lab as Graduate Research Assistant. Also, the community of this institute seems very friendly to me. Also, this institute has a beautiful campus. So, this would be a place that I would like to study and engaged in research activities for the next 5 to 6 years and so on.

After completing my Ph.D., my target is to ensure a position either in academia or industry that has the prospect of research and development based on my area of expertise.

So, I believe, I have the confidence, capabilities, and enthusiasm to admit into the Ph.D. program of Information Systems department offered by New Jersey Institute of Technology. I would like to produce some impactful research that would make me compatible with this degree.