Personal Statement

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Program: PhD in Computer Science (Fall 2019)

I saw a computer for the first time at about seven. One day my elder sister took me with her to a nearby 'Cyber café'. She was working in a computer and sitting beside her I was wondering how letters appeared in the screen by just pressing buttons printed on a rectangular shaped board. Since that day this magic box became my center of curiosity. As we had no computer of our own I could not fulfill my thirst for this 'Mystery Box'. We had our first computer in our home when I was about twelve years old. It was like the 'School of Hogwarts' itself came down to me to unravel its mystery. Gradually I learned more about computer. The more I knew the more it became interesting to me. So when the time came to make a choice for a major for my Bachelor's degree, I undoubtedly chose Computer Science and Engineering. Being an avid learner, my interest in unraveling the mysteries of Computer Science have made me want to pursue a PhD degree in this area as I am standing on the brink of completing my Bachelor's degree. My main research interest is machine learning, a field of artificial intelligence having a wide range of application today.

Couple of years ago one day I was scrolling my Facebook newsfeed. I saw a picture of a cute dog shared by my friend and pressed the like button. Since that day my Facebook feed became filled with pet news such as, suggestion of 'doglover groups', advertisement of dog food. This and couple of other similar incidents drew my attention and I wanted to know how they make different feed for different people. Then I came to know about Machine learning and its widespread application in our day to day life. That's why I chose machine learning as my thesis interest. At present I am working with Dr. Mohammed Eunus Ali on 'indexing data with machine learning'. The application of machine learning in database is a nascent field. The main purpose of my thesis is to index data in a way that it will take less time to find most frequent data. In short, we are trying to use query distribution to index data with machine learning. So far we have found some promising results in learning the data and query distribution of data and building a model which will take a data as input a give a predicted index as output.

In addition to machine learning my interest also lies in computational biology and data mining. Big data is the most discussed topic in recent world. The more the data is, the better a machine learning model can perform. So this large set of data has to be managed carefully and efficiently to use it successfully. Here comes the necessity of data mining. There is much scope of research in data mining. Similarly, computational biology is also a fascinating field. A lot of research getting carried out to store the information found in a person's DNA. As a whole it combines two separate fields Biology and Computer Science to dismantle the secrets of life.

For pursuing a career in research a person must have immense patience. From the very beginning of my educational life I have been patient in difficult situations. In our 6th semester in our operation system course we had to build NACHOS on our own. It is regarded one of the most critical

task throughout our undergraduate life. It required a lot of perseverance and determination to complete this task. About 80% students gave up after completing 50% of the task as it was enough to get a good grade. But I worked really hard day and night to complete the task and eventually after a lot of diligence and perseverance I managed to complete the NACHOS assignment. This and several other experiences have played an important role in preparing myself as a research based graduate student.

I have worked in a lot of group projects and led the team several times. In the 7th semester I, along with four of my classmates had to build a simple 4-bit computer simulation in Proteus. This project required a firm team management and strong communication between team members as each member had to build different parts of the same computer. My job was to synchronize all the parts after my team members built the parts. It was the hardest part of the project. I have done it so remarkably that my team members gave me the sobriquet "Charismatic Leader Afrina" for my excellent team management and communication skills and still call me by this name. Team projects have taught me to work with people with different mentality and motivate them to give their best to the team.

From my childhood I always wanted to be teacher. Even when I was about four, I used to play the role of a teacher while playing with my friends. Completing my PhD will take me one step closer to my dream. In near future I see myself in academia, sharing my knowledge with future generations of computer scientists or hold a research position in the industry. My ultimate goal is to carry out research which will affect people's lives and make their lives easier.

University of Virginia is my choice mainly for the kind of research that is being carried out here. It has a strong Computer Science department with a robust presence in the field of Machine Learning. Dr. David Evans's research group focuses on secure multi-party computation including Obliv-C, an adversarial machine learning called EvadeML and web security. I have always been fascinated by such machine learning application in web security. Vicente Ordóñez Román has interest in Computer Vision, Natural Language Processing and Machine Learning. In his recent work "Removal of Gender from Deep Image Representations" they used adversarial training to remove unwanted features corresponding to protected variables from intermediate representations in a deep neural network. It drew my attention and I want to work on interesting projects like this with him. Dr. Yanjun Qi focuses on making machine learning robust and trustworthy and joint structure learning of multiple related Gaussian Graphical Models which I found quite interesting. I am looking forward to join her team. Dr. Michael Albert's research focuses on practical problems at the intersection of machine learning, optimization, computation and economics. I always try to focus on solving practical problems with machine learning. I want to join his research team to solve practical problem which will ultimately ease the lives of people.

The PhD program of University of Virginia would really help me to grow as a graduate student and would be the perfect opportunity to fulfill my dream of taking teaching as a profession and performing research work for the greater benefit of people. I hope my achievements, skills and qualifications as a Computer Science student are found to be suitable for the PhD program in Computer Science.