Statement of Purpose

My primary research interests are Human-Computer Interaction, Data Mining, Machine Learning, Privacy, and Security. In my last term at university, I learned different topics e.g. Latent Dirichlet Allocation, Expectation Maximization, Convolutional Neural Network, Recurrent Neural Network, Deep Learning. We had some assignments based on some of the topics mentioned above e.g. unsupervised clustering using EM algorithm, topic modeling using LDA algorithm. These academic involvements really excited me to thrive on research related to these topics. I am interested in finding correlations among components. My educational and professional backgrounds have enabled me to think distinctively and to incorporate ideas from different domains. I can go into the depth of a concept and can relate scenarios for novel creations. Moreover, I have identified that being able to go from idea to result with the least possible delay is key to doing good research. I believe that I can quickly grab the basics of any tool, framework or model and thus can develop quick implementations. Besides, research is a field where one might face failure on a regular basis though giving enormous efforts. Learning through trial and error can teach one perseverance, test one's passion whether it is true or not. These realizations have inspired me in pursuing a research-based career through which I can utilize my capabilities well and also can serve the humankind. I am also interested in studying human factors in different scenarios e.g. privacy and security breaches.

My undergraduate research was related to big data privacy. Our developed architecture outperforms all the existing architectures in terms of data storage, computational and communication-based efficiency. To the best of our knowledge, our system architecture is the first one to ensure the privacy of genomic data as well as provide authentication of genomic data based disease risk queries and considers the effect of both alleles of an SNP and clinical factors of a patient in disease susceptibility. We gathered data from eupedia's website, synthesized them accordingly to conduct the experiments. Our paper titled "A Novel Secret Sharing Approach for Privacy-Preserving Authenticated Disease Risk Queries in Genomic Databases" got accepted in 42nd IEEE International Conference on Computer Software and Applications which had an acceptance rate of 24%. We have also extended our work and submitted it in the Journal of Information Processing. During this research, my thesis supervisor instructed me on going through research papers, cross-checking for loopholes, preparing necessary questions and their answers, improving technical writing and most importantly to identify the prime motivation behind specific research. Her mentoring and guidance surely has contributed a lot behind my enthusiasm to opt for a research career. I have done some minor studies on security issues in cloud computing. Currently, I am continuing a work based on machine learning which deals with MIMIC-III dataset. I am also involved in learning Keras and Tensorflow in depth. I have reviewed a paper in the field of machine learning. In short, the things I have learned until now regarding research have introduced me well to the challenges of pursuing a graduate degree.

As a Junior Software Engineer at Reve Systems, I worked on several projects e.g. a Russian Project: BubbleTone. I worked on different modules of this application, especially confide like feature development of this app. Throughout my service period at Reve Systems, I discovered that without giving proper emphasis on research, the development phase is sure to lack better

technology. Better technology begets from better research. These findings created more zeal within me to pursue a research career. Moreover, my team leader always inspired me to learn about increasing the code's usability and software performance in terms of memory management and computation. While working on chat-bot integration, I was introduced to conversational artificial intelligence and IBM Watson. These experiences have taught me to study various topics extensively. My deep passion for research, determination towards building new knowledge, self-driven motivation, conquering shortcomings through perseverance, unquenchable thirst for knowledge and continuous search for both questions and answers make me one of the strongest candidates in the field of research. As per as my career plans are concerned, I want to join a reputed university faculty or a renowned company's research & development department in my future career. I believe pursuing a research career can help me reach my career objectives.

Regarding my job experience as a Lecturer, I would like to mention that I am good at interacting with students and I regularly arrange brainstorming sessions with them. My active participation in community services has enhanced my communication skill to a substantive level which is important for acquiring new knowledge through sharing ideas with peers. During undergraduate studies, I had to tutor people to bear all my expenses and to support my family at times. As for this, I struggled to manage ample time to study during a term. These experiences taught me ways of preparing the best in the shortest amount of time. I believe that these qualities can help me in overcoming obstacles in my research career.

I have gone through some works of Dr. Latifur Khan, Dr. Shuang Hao, and Dr. Ryan P. McMahan. Dr. Khan's work on novel class detection in data streams considering the time constraints, concept-drift, and concept-evolution, developing a hybrid static-dynamic approach for vulnerability detection in Android apps have highly intrigued me. Both of these works emphasize phenomena to address practical scenarios and thus have drawn my keen interest. Dr. Hao's work on tracking elite Sybil attacks in popular user-review social networks, analyzing the reliability of reverse DNS as data sources, privacy threats measurement in China-wide mobile networks have accentuated me. I would like to work in similar projects and also in potential privacy attack assessment and analyzing human factors behind those attacks. Dr. McMahan's work on virtual reality ladder climbing for safe training, assessing the effects of different factors on the effectiveness of virtual reality training for visual scanning tasks have also drawn my keen interest. Determining the degree of complexity for designing a virtual reality system and also assessing the training performance are two important tasks in respective research areas. These works match mostly with my research interests and I believe I can contribute the most if I get the chance to work in similar projects.

Several other facts have driven me to apply to the Computer Science Ph.D. program at your university e.g. the diversified and quality research of the faculty members, the lab facilities provided by the university. Moreover, from my university seniors, I have come to know that your university is comprised of many international students which is crucial to learn things through collaboration with peers. I believe that I deserve to be among the strong contenders who you will wisely choose to offer admission and I am looking forward to contributing in different aspects by getting an opportunity to do quality research in your prominent institution.