In this modern era of digital revolution, we are immersed with data generated from numerous sources, including social media, web documents, sensor networks, geospatial sources, genomics, financial and business informatics and so on. With the advent of such vast amount of data, the necessity of extracting information by unraveling its underlying patterns is more than ever. Motivated by this rising demand, my research interest revolves around concerning the management of big data, with major focus on designing improved models to bring out the hidden information of data with minimal query cost. In the contrary, such cost minimization model for information retrieval often exposes challenges involving privacy and scalability of the underlying data management system and their associated queries. My research objective during my doctoral degree will be to overcome such challenges concerning big data management and analysis to find out the most out of the underlying patterns of data for the betterment of society.

From my early research expedition, I have been fascinated by the challenges regarding the data management issues. This fascination led me to a research work on cloud data management when I was a junior student of Department of Computer Science and Engineering in Bangladesh University of Engineering and Technology (BUET). The aforementioned research work involved identification of a privacy problem in a single provider cloud architecture which concerns the viability of a provider to mine client data for extracting sensitive information. To tackle this problem, I along with my co-authors proposed an algorithm of splitting the data into fragments and then distributing this data among multiple cloud providers. The work has been published as a full paper at SC’12 companion, which currently holds 26 citations. In addition, I worked in collaboration with my fellow-mates on the development of a system that keeps track of computational provenance record in the cloud architecture which was later published in DASFAA ’14 companion. Although these early research experiences seem trivial, but it shaped my research interest towards data management and data mining.

Upon realization of my research interest, I tried to enrich my knowledge by working on some emerging sub-areas of data management like crowdsourcing. During my undergraduate thesis, I worked on the development of a crowd-sourced module for road traffic estimation by video analysis with collaboration with Dr. Md.Yusuf Sarwar Uddin. As we planned the module to be deployable in mobile devices our central focus was on reduction of computational complexity without sacrifice of accuracy. In this problem, all the analyses were made by placing a slit across the video frames. Then analyzing the consecutive frames through the slit, we estimated various traffic flow parameters like street occupancy, lane compliance, over taking parameters were determined in a simplified way. This work has later been published in ICIEV’ 15. Meanwhile, I worked in development of a real-time crowd-powered testbed that allows a social media user to get a real-time evaluation of a proposed social media post. While developing this system, I experienced that some problems are better solved by combining human and machine intelligence. This research work has been published in SocInfo’15.

After completion of my graduation, I have joined as a lecturer of my own alma mater institution, BUET. Within the limited scope and time outside my full-time job in academia, I have been involved in courses (e.g., Data Mining, High Dimensional Data Management, Cloud Data Management) that aligns with my research interest as a part of my MSc, degree. Currently, I am working under supervision of Professor Dr. Mohammed Eunus Ali on the formulation of an Entropy based Graph Partitioning scheme to ensure the privacy of graph data without significant sacrifice of query processing time as a part of my MSc thesis work. Besides, I am working at "Stochastic Logic, Bangladesh” as a part-time quantitative researcher. By analyzing massive datasets generated from stock markets I designed a model which can detect market fragility from the stock price of different assets and their underlying correlation. At current stage, I am working on the concept of early detection of market fragility from the underlying data pattern in the vast stock data.

My experience upto now supports the notion that I am inclined to research, specifically in the field of data management and data mining and I intend to continue my research expedition in these fields. My vision is to actively contribute to the research and development of new tools and techniques in the data management field, more specifically in the field of resolving queries. These queries can be either primitive queries with newer challenges or absolutely new queries; either way, I expect them to have many real-world applications and make them privacy aware. I also hold interest to work in Social Network Analysis. My interest in working in social network analysis grew while working on a research project as a part of consultancy service for Infinity Technology Bangladesh Ltd and Bangladesh Police. In the current scenario of Bangladesh, we often see potential youths getting involved in militant activities. One of the root causes of diversion of young people has been preaching misleading ideas through social media posts. Ultimately, these posts result in critical impact on young minds and influencing the talented young people to be involved in hostile activities. As a part of the project we are developing a system which can help us detect such hostile posts and ultimately help us in early detection of the youths who are motivated in an evil way. But, while doing this project, I realized the negative energy hidden in social media and felt the necessity of meticulous research in this field.

Having spent a few years in exploring the field of varied research topics, now I envision in pursuing a doctoral degree as I firmly believe it will support me to do more focused research. When I was looking for prospective Ph.D. programs, the Department of Computer Science at the University of Illinois at Urbana-Champaign has stood out with its amazing collection of research opportunities offered in the field of data management and data mining. I had the opportunity to go through some of Professor Kevin C. Chang’s works on network mining over the web and social media, which strongly go with my research interest. I am also motivated by Professor Hari Sundaram’s work on social network analysis. The recent research projects of the faculties of the university are quite enthralling and seem to pave the way of many sub-areas of research that I would eventually love to explore. For these mentioned reasons and, I have applied for the PhD. program at the University of Illinois at Urbana-Champaign.