As a student of biomedical engineering, I was initially surprised to note my inclination and aptitude towards coding. I was exposed to basic programming through a mandatory course on C programming during my undergraduate studies which helped me form a strong foundation for learning MATLAB for transformation and image processing in my other courses. This was the starting point of a wonderful journey in programming and I took the initiative to learn other languages such as Java and Python. Gradually, I started writing codes for developing analytics algorithms and implemented my knowledge in projects such as prediction of credit card defaulters, content analysis, and cocktail party problems. For my thesis project, I decided to combine my passion for biomedical engineering along with my newfound passion in analytics by working on the development of a GUI for biomedical image reconstruction. Having learned a few more technologies such as MongoDB, HTML, and CSS, I chose to work as a Programmer Analyst at Cognizant so that I would have a chance to acquire professional experience and training in programming. The knowledge and skills I acquired during this period were quite vast and subsequently, I started performing data analysis for pharmaceutical clients at my workplace. This experience opened my mind to the possibility of working as a Data Scientist in the field of healthcare, and the more that I thought about it, the more I realized my innate passion for conquering this dream. Hence, in order to learn an advanced level of statistics and programming that can serve as a perfect base for my doctoral studies, I wish to pursue a postgraduate education in Computer Science with specialization in Data Science.

Since high school, I have had a keen interest in both mathematics and biology, and so, for my undergraduate program, I chose to pursue Biomedical Engineering at Vellore Institute of Technology, an institution renowned for its education and legacy. During this period, I thoroughly enjoyed my core subjects such as Digital Signal Processing, Biomedical Image Processing, and Biometrics as concepts in these subjects proved to be the perfect amalgamation of biology and computer science. Consequentially, I became more curious about the applications of programming in healthcare and so, I opted for the elective subject, Artificial Neural Networks. This course helped me bridge my knowledge gap in predictive analytics motivating me to take up several projects including my final year project where I designed a Graphical User Interface using Java.

One of the projects that I worked on soon after starting my course on Artificial Neural Networks was detecting credit card defaulters on the basis of credit history. For this, I used approximately a thousand records for gathering data and collected features such as loan duration, credit history, savings balance, and installment rates. Using these features, I divided the available data into test and training sets with which I generated polynomial features, scaled standards, and trained a logistic regression algorithm. While performing these steps, I learned how to pre-process data and generate a feature matrix bearing all the polynomial features and scale down values for logical comparison. I also learned about confusion matrices for accuracy evaluation and logistic regression algorithms for classification of data, and these skills served to be extremely insightful for my future projects.

Continuing my exploration of working with data, I decided to develop a content analyzer that would analyze large amount of content and create user stories out of the information. For this, I wanted to use a more challenging dataset, and so, I used data from manufacturing plants for training my

algorithm. In order to ensure that redundant data was removed in the data processing stage, I trained my model to eliminate unwanted features and ignore missing values. I finally used the Random Forest Classifier to fit the trained data with my model and achieved an accuracy of 79% upon testing. This project took me a step closer in understanding how to process a large amount of data and extract meaningful information out of it. Having acquired a good level of knowledge and experience in handling data, I decided to apply my knowledge in the field of healthcare by using machine learning algorithms for predicting diabetes in people likely to develop the condition. To achieve accuracy based on the Indian context, a PIMA Indians dataset was used for training the algorithm, and redundant and missing factors were eliminated during data processing. I used the Naïve Bayes algorithm for modeling the training dataset with my proposed model achieving a final accuracy of 73.59%. By this stage, I had developed a clear idea of how algorithms and data processing techniques could be beneficial in the medical field for helping both patients and doctors with their work.

For my thesis work, I wanted to take up a challenging project where I could apply my knowledge of computer technologies for an important and pressing need in the biomedical field, and so, I undertook work on the development of a Graphical User Interface for biomedical image reconstruction. This interface could be used by lab technicians for the manipulation of medical images such as zooming or rotating the image for better comprehension. I used HTML, CSS, Bootstrap, and JavaScript for coding the frontend and Java for coding the backend of the interface, giving me in-depth expertise in all these technologies. The interface could allow users to work on either a single image or multiple images and apply filters such as Gaussian filter, Butterworth filter, Hamming filter, Ramp filter, and Parzen filter on the images. The advantage of this GUI was that the users did not need to possess in-depth technical knowledge to manipulate images for doctors' enhanced understanding of the report, thus allowing reduced errors in performing diagnosis.

Having acquired a strong sense of making the medical field technologically competent, I realized the importance of acquiring in-depth understanding of the requirements of the field. So, I visited the Sterling Hospital in Vadodara where I closely worked with Biomedical Engineers and learned about the operation and functions of medical equipment. I specifically focused on understanding the limitations of these devices and troubleshooting processes, so that I could brainstorm about enhancing the working of these devices. I also learned how to present my observations in the form of a report as I prepared a detailed document focusing on my observations and providing appropriate recommendations. Apart from this, I did an internship at Bhagwan Mahaveer Viklaang, Jaipur, in order to understand real-world projects contributing to the advancement of biomedical technologies. Here, I got the chance to work on the development of a reciprocating ankle joint where I modified a mechanical orthotic base for providing automated motion in the knee and ankle regions for people who have a non-functional leg due to an accident. I also directly interacted with patients to understand their challenges and prepared a document where I reported these challenges and possible solutions to overcome them.

Aside from research projects and internships, I particularly enjoyed brainstorming sessions and Make-a-Thons, where we were asked to propose an innovative approach or technology relevant to healthcare and prepare a prototype of the proposed instrument in a limited period of time. These types

of sessions and events forced me to put my best skills in motion and combine my multi-disciplinary knowledge to bring about a revolution in one or more areas of healthcare. During one of these sessions, I decided to focus on a real-life problem due to which one of my friends had lost her life which was the inability of an external defibrillator to revive the functioning of her heart due to excessive fracture of her ribs. Attempting to overcome the limitations of defibrillators, I proposed a micro-electrode defibrillator with a micro pH sensor so that the pH of the pericardium fluid could be sensed and the forceful insertion of the defibrillator could be avoided which could potentially puncture the heart. This Make-a-Thon eventually served to be extremely fruitful inspiring me to come up with a possible solution for a problem that regularly costs several lives and eliciting a lot of appreciation from my faculty.

After completing my undergraduate studies, my research-oriented qualities and technological inclination motivated me to work at Cognizant mostly due to its reputation and rigorous training programs for new recruits. I initially joined the company as a Programmer Analyst Trainee and during my training period, I acquired in-depth hands-on experience in concepts such as object-oriented programming, data structures, restful APIs, and Spring Framework. After my initial training, I started working as a Data Warehouse Analyst for a pharmaceutical company where I developed test modules, performed debugging, developed Informatica mappings, entered data in RAVE forms, loaded data in Edit Check Engine, and performed discrepancy data testing. All these tasks have helped me develop a strong grasp of data management and processing techniques and how these can be used for various purposes. Apart from this, I have also performed database testing on SAS datasets and resolved client issues with the company products. During my work period here, I have emerged as a highly professional expert pushing me to develop an increased level of critical thinking and problem solving skills. Being responsible for team deliverables on more than one occasion has made me a highly systematic and organized individual with a system to manage daily tasks and complete them within deadlines.

My shift in focus from Biomedical Engineering to Data Science has taken place very gradually through my undergraduate and work periods through a series of projects, training programs, and learning opportunities. However, my ultimate objective is still the same which is to contribute to the field of healthcare by easing challenges faced by patients and doctors in providing healthcare services. Through the course of my educational journey, I have realized the potential of data and algorithms for developing technologically competent devices for the medical field, and in order to achieve expertise in this area, I wish to pursue a postgraduate education in Computer Science with specialization in Data Science. I also wish to specialize in Machine Learning, Statistics, and Programming which will serve as a strong foundation for my doctoral studies. Eventually, I wish to work on advanced data analytics and machine learning projects for improving risk mitigation and enhancing technological innovations in the field of healthcare.

In order to fulfill my goal of applying data technologies in the field of healthcare, I wish to take up a postgraduate program in Computer Science with specialization in Data Science at _____ University. The numerous research projects that I have worked on and the internships I have attended during my undergraduate and work periods have given me a strong command over the concepts. I now wish to deepen my understanding of the field and become up-to-date with the most recent trends in the

field of data processing and management. I intend to acquire a strong technical skill set by pursuing several exciting and challenging projects at your state-of-the-art research facilities. Being guided by accomplished faculty such as _____ and _____ at your premises will help me take my projects to the next level and acquire a more comprehensive understanding of the field.

My experiences in using my knowledge and skills for research projects in my field of interest have given me a strong knowledge of my subjects, and I am confident that my aptitude and passion for the field will help me stand out at your campus.