The amalgamation of Robotics and the field of Medicine has enhanced diagnostic capabilities and improved patient comfort. I am deeply fascinated and interested in Medical Robotics because of the ability of sensors and intelligent systems to mimic one of nature’s complex creations, the human body and provide alternatives to current methods of treatment**.** I find that there is a power to conquer any disability through innovation, augment human capabilities beyond the innate ones and provide a new identity through technology.

My passion for Robotics was instilled as early as my high school days when my team prepared to participate in a national level robotics competition. As a school student, the technology amazed me and sowed the seed to dream about the field of robotics. The dream was furthered when I first met the former President of India and renowned space scientist Dr.APJ Abdul Kalam, during my music recital in his presence whose words, “Dream. Dream. They transform into thoughts and thoughts result in action.” are still echoing in my ears*.*

Towards pursuing my futuristic dreams, I moved from a tier-two city in the south of India to the Metropolitan city- Chennai after my 10th standard. I received the proficiency awards for scoring a perfect 10 in my 10th standard and for obtaining the school's highest score in Physics in class 12. I believed that electronics, mathematics, and physics would provide the perfect foundation for a better understanding of robotics and I chose the electronics engineering program for my under-graduation.

During the first year, I spent a lot of time listening to lectures in Robotics on TEDx. I understood the importance of sensors in robotics and started to work on a simple pulse detection sensor at home. This soon turned to be a Research Project on Wearable Sensors for detecting Obstructive Sleep Apnea(OSA), a respiratory disorder where airway obstruction results in temporary cessation of breathing during sleep. It is a simple, home-based, one-of-a-kind method to detect OSA that has the potential to replace the complex hospital-based Polysomnography. The prototype has been **accepted for Indian Patent application** and the paper regarding this has been **published in IEEE XPLORE**. We received the **ethics committee clearance** for the prototype, tested it on patients and compared it with polysomnography and found it to be precise. The entire process has taught me the power of research in transforming the lives of people.

I successfully completed a 6-month course on NPTEL titled “INTEGRATED CIRCUITS AND MOSFETs” from the Indian Institue of Science, Bangalore by Dr.Hardik Pandya during my second year of under-graduation. Subsequently, I interned under Dr. Shanthi Pavan, Professor, Department of Electrical Engineering at the Indian Institute of Technology, Madras (IIT-M) and learned about the basics of MOSFETs and oscillators through LTSPICE software. This gave me a strong foundation as well as the confidence to design complex circuits.

I have studied multiple courses and been a part of 18 laboratory classes but four of them interested me the most; Control systems engineering, Probability and Random Processes, Robotics and Automation and Digital Image Processing. The ability to control devices and systems by designing control loops strongly attracted me towards the subject. My inquisitiveness to learn about control systems in robots lead me to do a course on Coursera on Control of Mobile Robots by Dr. Magnus Egerstedt, Professor, School Of Engineering and Computer Science, Georgia Institute of Technology. I was marveled by how I could design the path for robots and make them move. This interest motivated me to do an Internship in one of the leading space organizations in the world, the Indian Space Research Organisation(ISRO). During my time at the UR Rao Satellite Centre, I designed a simple algorithm to plan the path for a differential drive robot using Matlab. During the initial phase of the internship, I had the opportunity to also learn about the Attitude and Orbit Control System of Nano-satellites. This internship was life-changing as my passion for research grew beyond bounds.

Soon after this internship, I began exploring path-planning for robots as movement excited me the most! I completed another course on Coursera on Computational Motion Planning by the University of Pennsylvania. By this time, I realized the importance of delivering a practical model based on the skills and knowledge that I had gained so far. My team and I started to work on Motion Planning for a Mobile Robot in an unknown environment. (SHOULD I DESCRIBE MY PROJECT?)

At this point, I was deeply interested to combine my passion for robotics and control systems with medicine. I realized the value of using one’s knowledge and skills to improve the quality of life of those affected. My biggest motivator in rehabilitation robotics is Hugh Herr. I admire him for his ability to fight his disability and his extensive research on bionic legs. I wanted to extend this idea to bionic hands and felt that there was a need to design self-learning systems. (SHOULD I DESCRIBE MY PROJECT?) We began to work on a self-learning bionic arm using reinforcement learning. As I began my work, I understood that Bionic hands could be fitted with cameras that could control the hand movement by assessing the dimensions of the object. This knowledge of image processing could also be extending to computer integrated surgeries. In order to gain more on image processing and sensing, I interned at Virtusense Technologies, Chicago, Illinois. I designed an Algorithm for measuring heart rate from IR and visual images. I was their only intern working on this project and I was able to deliver the required result with an error of +-6 beats per minute within a period of two and a half months. I realized my potential to solve complex problems and also the power of my determination and hard work. Although I did not have the opportunity to work in Chicago, I worked on the project from home. This experience definitely enhanced my ability to co-ordinate between people who are not at the same place. Through all of my internships, I not only gained knowledge on a specific topic but also had practical exposure to solving real-world problems.

Being a trained Carnatic Singer for the past 16 years, I feel that my persistence, determination and focused learning has taught me to apply the same principles in academics as well. As a performer, I have handled multiple tensed and critical situations on the stage and I am confident of managing and solving critical problems both during my Masters’ and well as in life. Committed to an art form for more than a decade, I am sure that my passion for the field of Medical Robotics will not fade away.