

Statement of Purpose – Indian Institute Of Technology, Kharagpur.

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Since childhood, I was fascinated by technology and its substantial effect on human life. I used to visit industrial areas within my country Nepal but couldn't find the usage of the latest technologies and automation. For manufacturing a single product, a lot of time and effort were taken. I used to watch the discovery channel for hours where mega factories and its production system of multinational companies were shown. I was astounded to see how efficiently and easily millions of products were manufactured and handled without any delay in those industries. This engendered a desire in me to implement these techniques and automated machines within my country that would solve all the existing problems and delays in industrial manufacturing. As a result, this motivated me to delve deep into the field of robotics.

Fortunately, after my 12th grade, I was selected to earn my Bachelor's degree in Mechanical Engineering at the National Institute of Technology Karnataka; Surathkal, one of the premier institute of India. Apart from the core courses, I took the electives that are necessary for a sound understanding of robotics. Electives like Mechatronics System Design, Automatic control engineering, Robotics mechanics and control, Theory and practice of sensors and actuators and Fluid power automation not only enhanced my theoretical concepts but the practical conducted during the courses provided me some hands-on opportunity to implement the concepts. Besides the theoretical concepts, I believe that regular involvement in projects have improved my skills in the application of robotics and mechatronics in real life. I learned real-time simulations of the industry using Fluidsim, CNC train and LogixPro and simulation of various mechanisms using Matlab.

Furthermore, I did an internship at the Jindal Steel which is the largest manufacturer of steel in Asia. This allowed me to learn how real-time simulations of automated machines work in the industry. In addition to this, an internship at FluxGen Engineering Technologies Pvt Ltd, Bangalore enhanced my design skills using drafting software. I used Autodesk Fusion 360 to design a vertical garden (artificial garden inside a house with low space comprising of fruits and vegetables) and enclosure for a Protogen kit (a microcontroller made and manufactured by Fluxgen).

"Smart City", a semester-long project done during the sixth semester under the guidance of Prof. KV Gangadharan, has broadened my knowledge in this field. The project's main theme was to automate a city. Four buildings constituting hospital, apartment, school, and mall were in reach of three autonomous bots namely emergency, garbage, and delivery. These remotely controlled bots were called through the respective buttons

available inside the house. Supervision was done through the camera present on the top of the city which was used for image processing to generate the paths and eventually shortest path determined by Dijkstra's algorithm was covered by the bots. All the bots were pasted with ArUco on their top which was used to detect the bot position. All the programs that were written were executed on Raspberry Pi 3B+. The communication between all the bots, buildings and Rpi was achieved through MQTT communication protocol. I actively participated in making three automated bots with various proximity sensors. I was also involved in making smart apartments with suitable sensors and actuators. I got hands-on experience with sensors and actuators and deepen my knowledge in Arduino programming and Python programming. Thus, this project was the miniature model of the smart city which in the future can be implemented on a larger scale to make human life much easier and better. Additionally, the work was accomplished through the group work of students from interdisciplinary branches which gave me an opportunity to learn in a team comprising of students from various technical domains and enhance my interpersonal and communication skills.

I am fully aware of the fact that pursuing this course requires a high level of dedication, intelligence, and great sacrifice. I am quite confident that I have the capability and skills to contribute positively to your esteemed university. Thus, with great hope, I eagerly wait for your benevolent act of accepting me into your fold and granting me an opportunity to admit in my desired course. I will try my best to contribute something better in this field if I get the golden chance to be part of IIT, Kharagpur.