

Dear Sir/Madam,

I'd like to highlight some of my experience and skills and why I believe that I am a good fit for the role. I have recently completed my MSc in Robotics at Cranfield University with a focus on industrial mobile robots and manipulators. I have completed my bachelor's degree in Mechatronics Engineering with a strong influence in robotics, electronics and electromechanical systems. With my expertise in SOLIDWORKS during the final year of my undergraduate studies, I with a team of three capable mechatronics engineers carried out a research project based on mobile robots and robot manipulators named "*Design and Development of Mobile Manipulator for Warehouse Application*", keeping in mind the aim of reducing production loss, due to different factors like time, manual mistakes and much more. In addition to the design, I have also taken sole responsibility in the Embedded Electronics (Hardware) section. My experience in electronics has helped me select all the electronic components for the mobile robot including brainstorming different motors and sensors based on calculations of torque, force and much more. On the software side of this project, using different plugins, libraries, and a bit of C++ programming I have also worked on robot path planning and obstacle avoidance in Unity 3D, considering the different factors like wheel friction, slippage, and reaction force. During my postgraduate studies, my experience in CAD helped me design a robot end-effector for an academic project titled "*Engine Case Assembly Using Industrial Robot Manipulators*". The end effector was used to pick up the engine cases, place them on top of one another, and secure them with nuts and bolts. Another academic project titled "*Human-Robot Interaction of Mobile Robots in Industrial Applications*" was an opportunity for me to again showcase my CAD and electronics skills by innovating the mobile robot I designed during my undergraduate studies. I introduced a Human-Robot Interaction (HRI) feature for intuitive communication between the workers in the warehouse and the robot. Besides the HRI system, I have also upgraded the electronic systems with much more powerful yet power-efficient components. During the MSc group project titled "Robot Room Service" I worked on robot obstacle avoidance, detection, and path planning. For robot obstacle avoidance, detection, and path planning, the local and the global path planning systems are important to consider. I have worked with a couple of different local and global path planning systems like A* Algorithm, TEB local planner, and DWA local planner. The project was simulated on Robot Operating System (ROS). My work on this project has helped me to brush up on my ROS knowledge and sharpen my skills in ROS. I finally concluded my MSC with an individual research project titled "Hybrid framework for autonomous mobile robot collision avoidance". The project was about how robot path planning and obstacle avoidance in a dynamic environment could be made much more optimised and promising using the combination of Machine Learning with already available traditional approaches. A traditional approach like the A* algorithm was used for path planning and for obstacle avoidance, due to dynamic environmental complexities, machine learning was used. When compared to traditional approaches being used for obstacle avoidance, it was seen that due to the learning-based approach of the robot, the robot performed better with the machine learning approach. The project was solely carried out in ROS. This project has helped me dig deep and understand the concepts of ROS and Machine Learning. Additionally, I use my free time to gain more knowledge and sharpen my skills in ROS, MATLAB, CAD software, electronics (hardware), physics and mathematics. During my undergraduate studies, I have undergone academic training in Embedded Electronics, Internet of Things, and Industrial Manufacturing. I have also shared my knowledge with students new to topics like designing and autonomous systems through interactive seminars giving them a basic understanding of how things get done and helping them take their first step toward designing, developing, and building.

I'm currently employed with Carl Zeiss Microscopy Ltd as a Final Test Engineer. I'm working on different High Resolution Field Emission Scan Electron Microscopes (FE-SEMs) Manufactured, Assembled and Tested by the High Quality Imaging and Advanced Analytical Microscopy section of Carl Zeiss, the pioneer of science in optics and optoelectronics. Final testing of all the High Precision aspects, before it's being delivered to the customer. The skills I've gained on this job role are: Mechanical Testing, Electronic Testing, Electron Optics, Automated Software Testing, High Precision Testing, Automation, Mechatronics. My experience in working with mechatronics and automation systems have helped me to secure this job.

The core values of the company are in line with the qualities I am looking for in a job and an employer. I believe that this alignment, together with my existing experience and improved technical skills through the undertaking of my MSc and a bachelor's degree would enable me to contribute immediately and significantly to the role moving forward.

Please view my projects and analyse my practical efficiency via the link below:

<https://github.com/anomitra18/anomitramukhopadhyay.git>

I enclosed my CV for your attention and am happy to provide any further information in support of my application. I appreciate your thought and effort, and I hope to hear from you soon.

Yours faithfully,

Anomitra Mukhopadhyay