Labeeb Nassar

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EDUCATION

Indian Institute of Technology — **Palakkad, Kerala, India**
Bachelor's of Technology in Mechanical Engineering — 2020-2024
- Cumulative GPA(/10): 9.22

St. Jude Public School — **Thrissur, Kerala, India**
Class XII — 2019-2020
- Percentage of marks(%): 95

St.Jude Public School — **Thrissur, Kerala, India**
Class X — 2017-2018
- Percentage of marks(%): 96

WORK EXPERIENCE

UST. — **Trivandrim, Kerala, India**
Developer-III — July 2024-Present
- **Robotic Systems Developer**: Conduct research and development to identify and implement new techniques in robotic systems automation, enhancing system efficiency and reliability in real-world applications. Mainly focusing on drone and mobile robot systems.
- **Computer Vision Solutions**: Develop, test, and validate computer vision algorithms and solutions, focusing on object detection, image processing, and real-time visual analytics to support automated workflows.
- **Cross-Functional Collaboration**: Work closely with cross-functional teams to gather system requirements, integrate automation solutions, and refine performance based on testing feedback.
- **Documentation and Reporting**: Maintain detailed documentation of research findings, implementation steps, and testing results to support reproducibility and knowledge sharing.

INTERNSHIP EXPERIENCE

UST. — **Trivandrim, Kerala, India**
Internship Trainee — January 2024-April 2024
- Enhanced upper layer navigation stack for mobile robotics using ROS2-NAV2 framework. Contributed to the development of customized UI endpoints designed specifically for robotic systems like mobile robots and drones, leveraging React JS and Robot Web Tools. [*certificate*]

UST. — **Trivandrum, Kerala, India**
Internship Trainee — May 2023-August 2023
- Worked as a summer intern at UST Global, Trivandrum. During my internship I worked on the software(simulations) and hardware(assembly and PID control) development of automated mobile robots (mainly worked on four wheel mecanum, omni and differential drive configurations of the AMRs). During the course of my internship I developed controllers for each of the mobile robots for simulation in IsaacSim and gazebo as well as the controllers used during the hardware interfacing too. On the hardware side I worked on the PID control or the AMR and developed micro controller codes for the same from scratch. [*certificate*]

IIT Palakkad I-Hub Foundation — **Palakkad, Kerala, India**
Summer Intern — May 2022-July 2022
- To work on the fabrication of the components of the solar powered .The achievement of the solar glider is capable of continuous flight for a long time without being landed. This can be done by adding solar cells capable of storing energy during daytime and use it as the energy source during the night time.[*certificate*]

PROJECTS

- **Solar Powered Glider -** I worked on the development of a prototype solar powered glider ,which is to be used to acquire atmospheric data at high altitudes. We were working on the design and fabrication of a prototype solar powered glider. We also did a structural analysis on the stands of the glider, using both Ansys and fusion360 to find a fairly good material that would deflect a little when the glider is kept on the ground.[*link*]
- **A Replica of BB-8 Droid -** Basically the project involved making a replica of the star wars character called BB-8 droid which is a spherical robot. We used a hamster wheel mechanism to move the mobile robot which basically involves a separate mobile robot that moves inside the body of the BB-8. We did structural simulation on the robot base in fusion360. The BB-8 was also made to follow any object it is trained to follow via the help of Husky lens. [*link*]
- **Windshaper -** Contributed to the design and development of an in-house windshaper capable of generating various wind profiles corresponding to different wind module speeds. Utilized Fusion 360 for design and Ansys Fluent for wind profile simulations. Fabricated a prototype using plywood, incorporating BLDC motors with propellers in each wind module. [*link*]
- **Cosmo Logistics -** This project was part of a hackathon organized by IIT-Bombay (E-yantra). I was involved in simulation as well as the development of the software stack to be integrated with hardware for automating logistics operations, themed around a lunar base but essentially focused on warehouse automation and management. My work primarily included robotic manipulators (UR5) integrated with computer vision-based aruco-marker detection for pick-and-place tasks, and an automated 4WD mobile robot using the ROS2 NAV2 stack, with EKF sensor fusion for accurate robot localization within the environment.[*link*1, link2, GitHub]
- **Wheeled Mobile Robots Simulation -** In this course project I selected a specific configuration of a four-wheel-omni drive robot and made its kinematic and dynamic simulations along with control simulations in MATLAB. The design and details of the configurations of the robot are given in the links. [*link*]
- **Squid Based Jet Propulsion System -** This project focuses on designing a biomimetic squid jet propulsion system, drawing inspiration from the locomotion of squids. The goal is to develop a system capable of efficient movement in water by emulating the natural motion of squids.[*link*]
- **Mechanics and Control of Robotic Manipulators -** In this project I was involved in the design and development and simulation of a 4-DOF stationary robotic manipulator. The kinematics as well as the dynamics of the system was modeled using MATLAB scripting, on top of the forward based joint to configuration simulation the inverse open loop waypoint control as well as a closed loop waypoint control simulation using PD controller was also done. [*link*]

SKILLS

Tech Stack

- Fusion 360 • Solidworks • Gazebo • ROS & ROS 2 • Python • C++ • NVIDIA IsaacSim • SimScale • Ansys Structural & Fluent • Robot Web Tools • STM-32 • Arduino • Platform-IO • MicroROS • OpenCV-Python • TensorFlow • Scikit-Learn • Computer Vision • Machine Learning • Docker • AWS

Soft Skills

- Critical Thinking • Time Management • Problem Solving • Teamwork • Knowledge Acquisition • Presentations • Communication

LEADERSHIP & VOLUNTEERING INVOLVEMENTS

The Robotics Club — **Indian Institute of Technology, Palakkad**
Club Mentor — 2023-2024

- Worked on club projects and helped in mentoring the club members for various club activities.

Football Club — **Indian Institute of Technology, Palakkad**
Secretary — 2023-2024

- Managed and oversaw football related activities and events of the institute.