Nupoor Bibawe

nupoorbibawe@gmail.com | (602) 919-9304 | nupoorb.github.io | linkedin.com/in/nupoorbibawe

Education

Master of Science in Robotics - Artificial Intelligence August 2022 – May 2024

Arizona State University *3.87/4.00*

- Courses: Perception in Robotics, Integrating Robot-Learning with Human-Robot Collaboration, Multi-Robot Systems, Statistical Machine Learning, Modelling and Control of Robots, Linear Algebra, Artificial Intelligence.

Bachelor of Engineering in Computer Engineering August 2016 – November 2020

Savitribai Phule Pune University, India *3.64/4.00*

- Courses: Advanced Data Structures, Embedded Systems & Internet of Things, High Performance Computing.

Experience

Programmer Analyst – Full Stack Engineer February 2021 – April 2022

Cognizant Technology Solutions

- Developed back-end features throughout the **software development lifecycle** for mobile app using **Java** and **JavaScript**, employing **Agile** methodologies to ensure alignment with industry standards.
- Utilized **Spring Boot** and **Node** to develop and maintain 12 microservices, ensuring efficient communication between front-end and back-end systems through the integration of REST APIs and using **CI/CD**.
- Devised strategic code improvements, delivering a 30% performance boost and minimized database retrievals.
- Collaborated with **cross-functional teams** to architect, develop, and deploy end-to-end solutions on **Azure** cloud infrastructure, adhering to best practices and architectural principles for reliability, scalability, and security.
- Conducted **root cause analysis** for system failures using log analysis tools like ELK stack, reducing critical incidents through monitoring and automated alert systems.

Software Team Lead July 2017 – June 2019

MIT Robotics

- Led a team of 7 programmers in developing advanced **legged and wheeled autonomous robotic systems** and implemented three distinct autonomous gait patterns to achieve quadruped robot motion using inverse kinematics.
- Programmed remote-controlled 3- and 4-wheeled holonomic drives using **PID** and Odometry for precise motion and positioning, leveraging **C++** with 32-bit Arduino boards, resulting in a 50% reduction in robot travel time.
- Automated locomotion using machine vision and image processing techniques in **Python** with OpenCV. Interfaced Linux with Arduino to ensure fast real-time video processing, enhancing the overall performance of the system.
- Integrated a variety of sensors, including **LiDAR**, **cameras**, and **IMU**, using communication protocols such as I2C and SPI, conducting thorough comparisons and analyses to drive improvements in system performance.

Academic Projects

Real-time Monocular Depth Perception January 2023 – May 2023

- Engineered a **real-time** image processing pipeline incorporating object detection for monocular depth estimation, developing algorithms for geometric depth calculation and achieved ±3% precision in distance measurements.
- Conducted comparative analysis of state-of-the-art object detection models (**RESNET, YOLO, MobileNet**) using custom dataset, optimizing for precision and accuracy.

Path Planning and Reinforcement Learning January 2023 – May 2023

- Implemented Q-learning for reinforcement learning using **Gazebo** and **ROS** in two distinct robotic environments, enabling the system to optimize its decision-making processes and maximize cumulative rewards in 500 episodes.
- Optimized various search algorithms, including Greedy Breadth-First Search and A-star with a custom heuristic, to execute high-level search-based **path planning** with customized low-level actions for TurtleBot simulation.

Technical Skills

Programming Languages: C, C++, Python, Java, JavaScript, TypeScript, MATLAB, SQL, NoSQL

Robotics: Manufacturing Processes, SLAM, Navigation, Controls, Rapid Prototyping, Electromechanical Debugging

Tools: Simulink, Arduino, ROS, ROS2, Git, Gazebo, RViz, Azure, Docker, Kubernetes, AWS, SolidWorks

Libraries and Frameworks: TensorFlow, Pandas, NumPy, Keras, OpenCV, PyTorch, Spring, Angular, Node, React