

MIHIR KULKARNI

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Education

Worcester Polytechnic Institute

Master of Science, Robotics Engineering (CGPA:- 3.88 /4.0)

Aug 2022 - May 2024

Worcester, MA

College of Engineering, Pune

Bachelor of Technology, Electronics and Telecommunication Engineering (CGPA:- 8.05/10)

Aug 2018 - May 2022

Pune, India

Minor in Computer Engineering

Technical Skills

Languages/Tools: Python, C++11/14/17, ROS/ROS2, MATLAB, OpenCV, PyTorch, Tensorflow, PCL, GIT, Linux, Docker, Kubernetes, Azure, AWS, CARLA, PostgreSQL, Communication protocols (MQTT, TCP/IP, HTTP), Grafana, Kafka, IcCube

Network Architectures: NeRF, ResNet, VGG, YOLO, DenseNet, RCNN, GAN, U^2 Net

Hardware: Jetson Nano, RaspberryPi, STM32, Arduino, KinectV2, RealSense D435, Embedded protocols (CAN, I2C, SPI, UART)

Experience

Prime Vision

June 2024 - Present

Robotics & AI Software Engineer

Arlington, VA

- Built and deployed production ML and Computer Vision systems (OCR, visual perception) powering a fleet of 900+ autonomous mobile robots (AMRs) across 40+ US distribution centers and postal facilities, working across the full stack from model development to real-world edge deployment.
- Developed Python backend services and automated data and CI/CD pipelines (FastAPI, PostgreSQL, S3, Azure Databricks, Kafka, GitHub Actions) for dataset management, model training workflows, and continuous deployment at scale.
- Containerized and deployed GPU-accelerated inference with Docker on Kubernetes, serving low-latency predictions via NVIDIA Triton on Linux edge hardware (Dell NativeEdge), managing model orchestration and lifecycle across the fleet.

MathWorks

May 2023 - Aug 2023

Software Engineering Intern

Natick, MA

- Enhanced the Embedded Processor Modelling team's capabilities by enabling C++ code generation support for Embedded Linux and Xilinx Zynq SoC boards (Feature introduced in MATLAB 2024a release).
- Contributed to the SoC Blockset and Embedded Coder toolbox by integrating C++ support and writing test framework and efficient unit tests, achieving an 85% speed improvement for testing of Simulink models implementing CI/CD practices.

Binary Robotics

Oct 2020 - Dec 2020

Project Intern

Pune, India

- Collaborated on ROS navigation stack development for Autonomous Mobile Robots to assist hospital staff in critical operations.
- Assessed Localization and Mapping (**SLAM**) techniques for a mobile robot while implementing Extended Kalman Filter (EKF) and Particle Filter (AMCL) based Localization using an IMU and a 2D Lidar and deployed on a Jetson Nano.

Robotics and Automation Lab, COEP - [RSC](#)

Jun 2019 - June 2022

Undergraduate Researcher

Pune, India

- Led a team of 15 students focused on embedded systems for the international robotics competition ABU ROBOCON.
- Managed Perception, sensor fusion, circuit & PCB design, IoT and signal processing algorithms for wheeled and legged robots.

Academic Projects

Structure from Motion (SFM) and NeRF [\[link\]](#) | Python, 3D Reconstruction, NeRF

- Reconstructed a 3D scene from a finite set of images depicting a camera in motion using triangulation, camera pose estimation, non-linear PnP, and bundle adjustment. Employed NeRF for photo-realistic visualization of complex scenes.

Automatic Panoramic Image Synthesis [\[link\]](#) | PyTorch, OpenCV, Pattern Recognition

- Developed a panorama stitching pipeline using classical image processing techniques like Homography, RANSAC, ANMS, SIFT, and Feature Matching, combined with a supervised deep learning model leveraging the HomographyNet CNN architecture in PyTorch.

Deep Learning and Vision-based Robotic Grasping of Unknown Objects [\[link\]](#) | PyTorch, OpenCV, MoveIt!

- Developed an end to end pipeline for optimal grasping of objects leveraging VGG16 and ResNet50-based network architectures with Transfer Learning in PyTorch. Demonstrated the pipeline on a custom 3D printed 5-DoF robotic arm using MoveIt! and KinectV2 depth camera with a >90% success rate for pick and place of unknown objects.

LiDAR Semantics | Python, Semantic Segmentation, ADAS

- Applied Point-to-Point and Point-to-Plane ICP to stitch multiple LiDAR point clouds from the KITTI dataset. Performed semantic segmentation on individual RGB images and projected the semantic labels onto the Point Cloud.

Feature Matching Comparison: SuperGlue vs. LoFTR | Python

- Evaluated and contrasted the performance of two SOTA feature matching models, SuperGlue and LoFTR, in various scenarios.

Planning & Perception for Autonomous Vehicles in Urban Environment using CARLA [\[link\]](#) | Python, CARLA

- Implemented conformal lattice-based local planner and Haar Cascade classifier for pedestrian avoidance using CARLA Python API.

Papers & Publications

- M. Kulkarni, P. Junare, M. Deshmukh, and P. Bartakke, "Deep Learning based end-to-end Grasping Pipeline on a lowcost 5-DOF Robotic arm," 2022 IEEE 19th India Council International Conference (INDICON), Kochi, India, 2022, pp. 1-6, doi: 10.1109/INDICON56171.2022.10040180. [\[paper\]](#)