

PARTHASARATHY REDDY BANA

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SUMMARY

Robotics Engineer with 4.5 years of industry experience in fast-paced, early-stage startups, specializing in motion planning, perception, software development, and system integration. Skilled in bridging hardware and software to deliver fully integrated solutions for mobile service robots.

EDUCATION

Oregon State University, Corvallis, OR

Master of Science in Robotics — GPA: 3.7/4.0

09/12/2018 - 09/03/2021

MVJ College of Engineering, Bangalore, India

Bachelor of Engineering in Electrical and Computer Engineering — GPA: 3.4/4.0

08/01/2014 - 07/19/2018

SKILLS & OTHERS

Coursework: Deep Learning, Computer Vision, Mobile Robotics, Robot Manipulation, Applied Machine Learning

Software Libraries: ROS1 and ROS2, TensorFlow, OpenCV, Gazebo Sim, MoveIt2

Tools and Standards: MISRA, ISO 26262, USB and CAN J1939 protocols

Computer Programming: Proficient in C++14/17, Python and MATLAB

PROFESSIONAL EXPERIENCE

Pickle Robot Company, Cambridge, MA

Motion Planning Engineer

05/15/2025 - Present

- Co-led the team by defining comprehensive system requirements and architecture documentation to ensure scalable, maintainable, and reliable end-to-end mobile manipulation stack for trailer-unloading AMRs with Kuka arms.
- Reduced autonomous driving time from 6.0 to 2.4 minutes per trailer by engineering a custom grid-based search planner, TOPPra trajectory generator and feedforward PID tracking controller.
- Implementing real-time trajectory tracking (Ruckig, TOPPra) and collision checking (FCL) to optimize arm and base coordination.
- Managing the full development lifecycle, from initial architecture to field-testing and current deployment at customer warehouse sites.

SafeAI Inc, Santa Clara, CA

Software Engineer - Controls

06/14/2022 - 05/01/2025

- Led the design and implementation of critical quality safety control algorithms for Caterpillar HM400, Hitachi Eh3500 haul trucks and Komatsu D6N bulldozer.
- Developed Python scripts for tuning and calibrating vehicle controllers such as Stanley, skid-steer and PID.
- Designed and implemented the drive-by-wire interface module in the autonomy stack, using c++.
- Supported system integration and QA debugging of software components on newly retrofitted vehicles at client sites.

Symbio Robotics Inc, Emeryville, CA

Robotics Software Engineer - Controls

01/27/2022 - 05/27/2022

- Automated taring and noise characterization, for force-torque sensors on 6-axis robot arms using Python scripts
- Developed functional tests for Optodaq and ATI force-torque sensors to enable users to monitor sensor faults and damage.

Picknik Robotics Inc, Boulder, CO

Robotics Engineer Intern

10/11/2021 - 01/26/2022

- Supported the hardware integration and testing of features, in Python, ROS2 and MoveIt2, related to everyday tasks such as picking objects, opening doors and drawers using UR5e and Kinova Gen 3 robot arms (these are 6 axis robot arms).
- Managed networks and site configs for robots in the office and contributed to development of tele-operation features for robots using MoveIt2 and Picknik's supervised autonomy product - MoveIt Studio.

Vecna Robotics, Waltham, MA

Computer Vision Intern

06/21/2021 - 09/01/2021

- In the Advanced Development team, optimized custom 3D imaging algorithms and successfully integrated the Intel Realsense L515 Lidar camera on robot manipulator arm to automate refuelling of fuel cells for autonomous mobile robots.
- Implemented custom perception algorithms involving KD-trees and RANSAC methods for detection of non-standard pallets using low-lift trucks with 2D Pepperl & Fuchs lidars.
- Developed Python GUIs for test automation using Tkinter and PyQt and support HIL testing in warehouse environments.

Tennibot Inc, Auburn, AL

Robotics Engineer Intern

06/15/2020 - 09/01/2020

- Implemented custom pipeline to integrate Tracknet-II and Openpose for player shot analysis through human pose estimation and tracking fast paced tennis balls on tennis court using a monocular camera and Raspberry Pi 4.
- Supported the integration of ROS2 navigation, behavior trees and custom planners to improve decision making during outdoor navigation of the Tennibot rover.

PUBLICATIONS

- Parthasarathy Reddy Bana, Yao-Lin Tsai, and Heather Knight. 2021. SanitizerBot: A Hand Sanitizer Service Robot. In Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 Companion). Association for Computing Machinery, New York, NY, USA, 661. <https://doi.org/10.1145/3434074.3447274>
- Y. -L. Tsai, P. R. Bana, S. Loisel and H. Knight, "SanitizerBot: How Human-in-the-Loop Social Robots Can Playfully Support Humans," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, 2022, pp. 8278-8285, doi: 10.1109/IROS47612.2022.9981917.
- Yao-Lin Tsai, Parthasarathy Bana, and Heather Knight. 2021. Can Service Robots Help Best Practices for COVID? In Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 Companion). Association for Computing Machinery, New York, NY, USA, 615–617. DOI:<https://doi.org/10.1145/3434074.3446947>
- I. H. Shanavas, P. B. Reddy and M. C. Doddegowda, "A Personal Assistant Robot Using Raspberry Pi," 2018 International Conference on Design Innovations for 3Cs Compute Communicate Control (ICDI3C), Bangalore, India, 2018, pp. 133-136, doi: 10.1109/ICDI3C.2018.00038.

ACADEMIC PROJECTS

Predicting Navigation Failures based on Features in the Environment

Guide: Dr. William D. Smart, Personal Robotics Lab

Apr. 2019 – Sept 2020.

- Trained a custom CNN LSTM model to predict robot navigation failures based on certain features in the environment.
- Simulated navigation behaviors of Fetch Robot, using Gazebo 9, in KTH map datasets to collect recovery behavioral data.

Design of an Autonomous Mobile Manipulation System

Guide: Dr. Joseph Davidson, CORIS Institute

Apr. 2020 – June. 2020

- Designed and simulated a Fetch Manipulator Robot for autonomous grasping of obstacles in indoor environment.
- Implemented and integrated perception of objects for Fetch robot using the YOLO v3 algorithm and ROS navigation stack.

Autonomous Building Floor Activity Profiling System

Guide: Dr. William D. Smart, Personal Robotics Lab

Apr. 2019 – June. 2019

- Implemented SLAM using ROS Gmapping and Optical Flow techniques for autonomous navigation of Pioneer 3DX robot.
- Successfully monitored energy consumption in lab space based on information about human activity, obtained by robot.

Efficient Robot Motion Re-Planning in Dynamically Changing Environments

Guide: Dr. Geoffrey Hollinger, Robotic Decision Making Lab

Jan. 2019 – Apr. 2019

- Developed an integrated PRM based algorithm that provided better performance guarantees in terms of optimality in computation time when compared to traditional path planning algorithms like A*, RRT and Probabilistic Roadmaps.

Instrumented Door for Grasp Manipulation and Testing

Guide: Dr. Cindy Grimm, Human Perception and Control Systems Lab

Dec. 2018 – Mar. 2019

- Designed a door with sensorized knob and handle that were equipped with Force Resistive sensors to measure the amount of force that was being exerted by the Kinova Robot arm on every grasp to understand the behavior of grasp mechanisms.