

# NARENDHIRAN SARAVANANE

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Result-driven graduate with 2+ years of intern exp. seeking full-time roles (May '24) in Robotics & AI

## EDUCATION

**MS in Robotics and Autonomous Systems (Honors)**, Arizona State University | AZ, USA GPA: **4.0 / 4.0** May 2024  
**B.Tech in Mechanical Engineering**, Indian Institute of Technology Patna | Bihar, India GPA: **7.5 / 10** Aug 2022

Tech Finalists: International Robotic Competition (eYRC) & Bachelor's Capstone Project in Mechanical Department  
Conferences: IEEE, American Control Conference ACC'24 | Indian Institute of Science, I-4AM'22 | Delivered 2 talks  
Courses: Linear Algebra | Sequential Decision Making | RL | ML | UAVs | Perception | Optimization | Controls | PDE

## EXPERIENCE

**Brainchip, Solutions Architect Intern (Robotics & RL Specialist)** | Remote (California, USA) May 2023 - Aug 2023

- Implemented **3D models** and ROS-joints controlled through Q-Learning, **RL** model operated on AKD1000 Chip.
- Crafted an AI-controlled robot entirely from the ground up and expedited development by 40%.
- Engineered the model's transition from TF to BrainChip's MetaTF framework, enriching customer acquisition.

**Indian Institute of Technology Bombay, Robotic Software Engineer Intern** | Remote (India) May 2020 - Aug 2020

- Led an 8-person team to develop a fiducial-marker-based **localization** model for an unstable camera feed.
- Optimized the localization model using V-rep for real-time camera feeds, achieved a calibration error of  $\leq 0.5\%$ .
- Orchestrated design, combined rule-based script, and unit tested to validate auto-evaluators with 95% coverage

**e-Yantra, Robotic Engineer (Co-Founder and Team Lead)** | India Aug 2019 - July 2020

- Coordinated a 4-member team to National Finalist Status (Top 0.3%), built a multi-tasking robot from scratch.
- Optimized **pathfinding**(A\* & Dijkstra) algo. & actions, reduced execution time by 22%, enabled faster navigation.
- Integrated IR, proximity sensors for perception & encoder motors, Servos for autonomous actions | Used **CNC**.

**ABU Robocon 2020, Robotic Engineer** | India Jan 2019 - Feb 2020

- Directed team efforts, achieved top 15 (national) in ABU Robocon Stage 1 through innovative robot design.
- Engineered a 3-wheeled **omni-drive** system, achieved precise movement in any direction for the Pass Robot.
- Modelled throwing hand compliance with **pneumatics** parameters using the Catapult mechanism and deployed.

## SKILLS

Languages	Python, C/C++, C#, embedded C, Java, Catkin, CUDA, CMake, Matlab, Git, Bash, LaTeX, Vim, PCL, I2C
Robotics	ROS 1/2, V-Rep, Gazebo, Ansys, MoveIt, MuJoCo, FEA, CFD, Arduino, AtMega 2560, Sensor Fusion, PLC
Software	Linux, Tensorflow, Pytorch, Docker, OpenCV, ZeroMQ, B0RemoteAPI, CorelDraw, Solidworks, Fusion360
Certifications	Robotics Software Engineer, Udacity Nanodegree – (2023)   Self-Driving Cars, University of Toronto – (2023)

## PROJECTS

**LLMs operated Autonomous Car Agent (Carla Simulator)** - Capstone Master's Project Nov 2023 - May 2024

- Trained using a custom-generated dataset (500GB), coupled with GPT reasoned autonomous decision-making agent.

**Home-Delivery Bot** | Robotics Software Engineer, Udacity Nanodegree (Scholarship Scholar) Dec 2022 - April 2023

- Developed a robot in Gazebo (**ROS**) & integrated with **feedback control** for state dynamics.
- Implemented SLAM and sensor fusion (Rotary Encoder, Odom & IMU) for navigation & deployed AMCL.

**IEEE Paper** – Control Systems Society Conference (Paper Accepted) Jan 2023 - Jan 2024

- Distributed RHC approach for multi-agent systems with privacy and maintained MTL specifications.
- Utilized Kalman filter equations and **MILP** to encode causal MTL specifications as constraints.

**Visual Tracking UAV** - Mambo Drone Jan 2023 - April 2023

- Developed a high-performance, **low-level flight control** algorithm with an integrated **Kalman Filter** for an Drone.

**Meta's Research Enhancement** – Object Goal Navigation Jan 2023 - April 2023

- Integrated **YOLOv7** and performance enhancements led to a 7% success rate boost in object goal navigation.
- Engaged with a deep RL model, leveraged On Policy. Integrated **RRT** to path planning replaced Fast Marching.

**Dc-GANs** (Deep Convolutional Generative Adversarial Network) – Fashion MNIST Nov 2022 - Dec 2022

- Devised a DcGAN **neural** architecture & successfully trained within 50 epochs to generate realistic synthetic images.
- Crafted a Tensorflow-based neural network and optimized the generator and discriminator model.

**Robotic Arm** – Singularity Analysis Nov 2022 - Dec 2022

- Utilized Applied Inverse Kinematics to analyze a 6-DoF robotic arm, achieved a 99.9% singularity avoidance.
- Implemented **Trajectory Planner** for a Kinova Gen3 robotic arm, optimized the trajectory within the Space.