First LastName

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May 2024 graduate seeking full-time opportunities in Robotics & AI

Experience

Brainchip, *Robotics & AI Solutions Architect Intern* | Remote   *May 2023 - Aug 2023*
- Developed and deployed **RL** models for robotic systems, integrating **physics engines** to solve real-world problems.
- Drove advanced solutions, optimizing robotic platform performance and stability through **ML-driven control systems**.

NICE Lab – Stretch RE1, *Research Volunteer* (Prof. Zhe Xu) | Arizona, USA   *Jan 2023 - Present*
- Develop and evaluate differential control synthesis algorithms for multi-agent systems.
- Conduct perception and RL research with the Hello Robot, focusing on causal inference and counterfactuals for RL.

Indian Institute of Technology Bombay, *Robotic Software Engineer Intern* | Remote   *May 2020 - July 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, achieving a calibration error of ≤0.5%.
- Designed a rule-based visual scripting framework for configuring **auto-evaluators** through **B0RemoteAPI** for evaluation.
- Incorporated a **unit testing** framework with automated test cases to validate the auto-evaluator model.

e-Yantra – Quadraped Bot, *Co-Founder and Team Lead – Robotic Engineer* | Bihar, India   *Aug 2019 - Feb 2020*
- Led a 4 member team of IIT Patna's student quadruped robot team to National (India) Finalist Status (99.7 percentile).
- Built a robot from scratch possessing vision, picking, placing, and autonomous decision-making capabilities.
- Worked with **2D Path Planning**(A* & Dijkstra) algorithms to take the shortest path during natural emergencies.

Neyveli Lignite Corporation India Ltd. (NLCIL) : *Mechanical Engineer Intern* | Neyveli, India *June 2019 - Aug 2019*
- Improved circulating water pump efficiency by 8.44% using **coating technologies** with a payback period of < 2 months.
- Led team to assess and maintain water circulating pump through coatings, showcasing strong team leadership skills.

Education

4.0/4.0	**MS in Robotics and Autonomous Systems**, *Arizona State University*	Arizona, USA	*2022-24*
7.5/10	**BTech in Mechanical Engineering**, *Indian Institute of Technology Patna*	Bihar, India	*2018-22*

Achievements: Finalists @ International Robotic Competition (eYRC, IIT Bombay) | Finalists in Mech. Dept. - Bachelor's Capstone Proj.
3 International Conferences: I-4AM '22 (Indian Institute of Science, Banglore) | IEEE (Submitted) | Delivered 2 lighting talks
Courses: Advance Linear Algebra | Sequential Decision Making | RL | ML | UAVs | Perception | Design Optimization | Controls | PDE

Skills

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

Projects

Home-Delivery Bot   *Dec 2022 - April 2023*
Service bot, Personal Project
- Developed a environment utilizing **Gazebo** and implemented a mobile robot integration with ROS node to chase an dynamic target.
- Utilized **Adaptive Monte Carlo localization** algorithms in ROS and deployed a optimized **RTAB-Map** to create 2D environment.
- Designed and implemented **C++ ROS** packages to autonomously navigate using **Dijkstra's** and to perform robotic manipulation.

IEEE Control Systems Society Conference (Paper Submitted)   *Jan 2023 - May 2023*
Distributed Differentially Control Synthesis for Multi-Agent Systems with Metric Temporal Logic Specifications
- A distributed RHC approach for multi-agent systems with privacy by adding noise to their outputs, maintaining MTL specifications.
- Utilized **Kalman filter** equations and **MILP** to encode MTL specifications as constraints.

Visual Tracking Unmanned Vehicle - Mambo Drone   *Jan 2023 - April 2023*
EGR 598 - Robotics Systems II (Course Project)
- Developed a high-performance, **low-level flight control** algorithm with integrated **Kalman Filter** for autonomous Mambo Drone.
- Successfully integrated an advanced image processing module for various capabilities in a real-world Mambo drone.

Object Goal Navigation using Goal-Oriented Semantic Exploration   *Jan 2023 - April 2023*
CSE 598-Perception in Robots (Course Project)
- Integrated **YOLOv7** and performance enhancements led to a 7% success rate boost in object navigation per path length.
- Collaborated on a deep RL model, leveraging **On Policy** & Local Policy, Integrated **RRT** to path planning replacing **Fast Marching**.

Deep Convolutional-GAN using Fashion MNIST   *Nov 2022 - Dec 2022*
EGR598-Machine Learning and Artificial Intelligence(Final Project)
- Developed a Deep Convolution Generative Adversarial Network **DC-GANs** architecture and successfully trained within 50 epochs.
- Attained an impressive DCGAN loss rate of 0.014 for the generator model, demonstrating generation of realistic synthetic images.

Singularity Analysis of a Robotic Arm   *Nov 2022 - Dec 2022*
Modeling and Control of Robots
- Observed a behavior of the **6-DoF robotic arm** in the singularity space. A drastic change of 10^{-4} to 10^{-6} over 0.005 seconds.
- An swift behavior in the Jacobian matrix was noticed to set a safe boundary avoiding singularity space.