Narendhiran Saravanane

+1 (602) 693 6573 | narendhiran2000@gmail.com | naren200.github.io | github.com/naren200 | linkedin.com/in/narendhiran2000

Summary

Results-driven graduate student with a proven ability to tackle complex challenges and drive innovation. Demonstrated success in delivering impactful projects, optimizing algorithms, and leading teams. Passionate about leveraging cutting-edge technologies to advance the field of robotics and create real-world solutions.

Areas of Interest: AI | Neural Networks | Sensor Fusion | Perception | UAVs | Navigation | Robotic Manipulation

Education

2022-24	**MS in Robotics and Autonomous Systems**, Arizona State University, Arizona	*4.0/4.0*
2023	**Robotics Software Engineer**, Nanodegree program, Udacity	
2018-22	**BTech in Mechanical Engineering**, Indian Institute of Technology Patna	*3.0/4.0*

Relevant Coursework: Robotics Advanced Concepts and Analysis | Advance Linear Algebra | Reinforcement Learning | Unmanned Vehicles | Machine Learning | Path Planning | Perception | Localization | Mapping & SLAM | Design Optimization | System Dynamics and Control

Skills

Technical Skills	Python (TensorFlow, Keras, Pandas, Scikit-learn, OpenCV, etc.), C/C++/embedded C, V-rep, Matlab, ZeroMQ, B0RemoteAPI.
Tools, and OS	Linux, Shell (Bash), LaTeX, Tableau, Jira, Pytorch, Git, CorelDraw.

Work Experience

Solutions Architect Intern: Reinforcement Learning & Robotics *California, United States*
Brainchip *06/2023 - 08/2023*
- Developed & Deployed ML models for real-world problem-solving, showcased expertise in reinforcement learning and **physics engines**.
- Collaborative team player, integrating **RL** algorithms into robotic systems through cross-functional collaboration.
- Focus on delivering advanced solutions, optimizing performance and stability of robotic platforms through **ML-driven control systems**.

Software Engineer: Computer Vision *Bombay, India*
Indian Institute of Technology Bombay *05/2020 - 07/2020*
- Developed a **fiducial-marker-based localization model** for an unstable camera feed with an 8-person team.
- Optimized the localization model using **V-rep** for real-time camera feeds, achieving a calibration error of ≤0.5%.
- Created 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.

Projects

Home-Delivery Bot *Arizona, USA*
Service bot, Personal Project *12/2022 - 04/2023*
- Developed a dynamic 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** algorithm and to perform robotic manipulation.

IEEE Transactions on Automatic Control (Paper Submitted) *Arizona, United States*
Distributed Differentially Control Synthesis for Multi-Agent Systems with Metric Temporal Logic Specifications *01/2023 - 05/2023*
- A distributed RHC approach for multi-agent systems with privacy protection 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 *Arizona, USA*
EGR 598 - Robotics Systems II (Course Project) *01/2023 - 04/2023*
- Developed a high-performance, **low-level flight control** algorithm with integrated **Kalman Filter** for autonomous navigation of the 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 *Arizona, USA*
CSE 598-Perception in Robots (Course Project) *01/2023 - 04/2023*
- 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** and Deterministic Local Policy, Integrated **RRT** to path planning replacing **Fast Marching**.

Deep Convolutional-GAN using Fashion MNIST *Arizona, USA*
EGR598-Machine Learning and Artificial Intelligence(Final Project) *11/2022 - 12/2022*
- 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 the ability to generate realistic synthetic images.

Singularity Analysis of a Robotic Arm *Arizona, USA*
Modeling and Control of Robots *11/2022 - 12/2022*
- 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.

Autonomous Robot | Virtual & Real-life Simulations (Won Competition Finalists) *Bombay, India*
e-Yantra, International Robotics Competition, Indian Institute of Technology Bombay. *10/2019 - 02/2020*
- 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.