Aravind Narayanan

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Education

University of Toronto *Sep 2023 - May 2025**

Masters in Electrical and Computer Engineering Toronto, CA

- **Courses:** Reinforcement Learning, Data Science and Analytics, Natural Language Processing, Cloud Computing, Parallel Programming, Designing Web-Scale Applications
- **Achievements:** Presented a poster at 2024 Toronto Robotics Conference.

International Institute of Information Technology, Hyderabad *Jul 2019 - May 2023*

Bachelor of Technology in Electronics and Communication Engineering (Honors) Hyderabad, India

- **Teacher Assistant (TA):** Processor Architecture, Systems Thinking, Probability, and Statistical Methods in AI
- **Courses:** Computer Vision, Data Structures, Cognitive Modelling, Processor Architecture
- **Achievements:** Dean's List for five semesters
- **Positions:** Marketing Head in Entrepreneurship Cell, Robotics Club Head, Photography Club Head

Experience

Computer Vision Summer Intern *May 2024 - Present*

Neural Robotics Lab Toronto, ON, Canada

- Developed an optimized monocular depth estimation pipeline, integrating depth images and point clouds to reconstruct walking environments from 2D images with 82.6% accuracy in extracting stair parameters.

Research Assistant *May 2024 - Present*

Laboratory for Applied Informatics Research (LAIRHub) Toronto, ON, Canada

- Enhanced an information retrieval system by applying AI techniques for clustering and labeling publications, significantly improving cluster accuracy using large language models (LLMs).
- Designed and implemented a similar solution for RSS feed data, developing a well-defined ETL pipeline to enable dynamic news clustering based on user prompts.

Python Developer *Oct 2023 - May 2024*

Bernhardt-Walther Lab Toronto, ON, Canada

- Developed and maintained pyMLV, a Python-based tool for analyzing multi-voxel pattern data in neuroimaging.
- Optimized the tool for extracting image properties by enhancing algorithms and integrating new features, improving performance and enabling more accurate studies of mid-level visual representations.

Computer Vision Developer *Oct 2022 - May 2023*

Ensologic Commerce Hyderabad, India

- Engineered a multi-view 3D reconstruction pipeline for an e-commerce startup using the Amazon-Berkeley dataset, enhancing the website's user experience.
- Led the development of a noise reduction and image segmentation pipeline, improving visual quality by resolving occlusions for a more polished version of the company's website.

Robotics Researcher *May 2021 - May 2023*

Robotics Research Center (RRC) Hyderabad, India

- Built a software stack for mobile manipulators using whole-body control to improve door interactions and overall robot capabilities.

Technical Skills

Programming Languages: C, C++, Python, MATLAB, JavaScript, Bash
Frameworks: PyTorch, TensorFlow, OpenCV, Robot Operating System (ROS), PyBullet
Tools and Databases: SQL, PostgreSQL, Docker, Kubernetes, AWS, GCP, Git

Projects

CLEAR-Net: Cart-Pole Learning with Enhanced Adaptive Reinforcement Network *AI, Python*

- Conducted a comparative analysis of Deep Q-learning and Policy Gradient methods, highlighting the stability and robustness of PPO and SAC for dynamic environments, with a focus on on hyperparameter tuning and reward shaping.

Autonomous Vehicle Navigation and 3D Environment Mapping *Python, Open3D, SLAM, ROS*

- Implemented 2D-SLAM with pose-graph optimization and loop-closure constraints for accurate positioning.
- Employed advanced algorithms for motion planning and collision avoidance in autonomous navigation.

AI-Driven Health Monitoring System on Google Cloud Platform *Big Data, GCP*

- Engineered an end-to-end health monitoring system using AI models to analyze respiratory pulse signals and sleep patterns, showcasing scalable solutions on cloud platforms.

Lyric Mood Classification with Deep Learning *Deep Learning, PyTorch, LLMs*

- Led a team comparing deep learning and traditional machine learning approaches for mood classification in song lyrics, achieving an accuracy of 85.2% using a GPT model with word2vec embedding.