

Aravind Narayanan

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Education

University of Toronto

Sep 2023 - Aug 2025*

Master of Engineering in Electrical and Computer Engineering

Toronto, CA

- **Courses:** Reinforcement Learning, Data Science and Analytics, Natural Language Processing, Cloud Computing, Financial Engineering
- **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), GPA 8.97/10.0

Hyderabad, India

- **Teacher Assistant (TA):** Processor Architecture, Systems Thinking, Probability, and Statistical Methods in AI
- **Courses:** Computer Vision, Data Structures, Mobile Robotics, Cognitive Modelling, Processor Architecture
- **Achievements:** Dean's and Merit 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 a novel pipeline for monocular depth estimation, enabling accurate reconstruction of human-robot walking environments from 2D images, with a focus on extracting stair height and distance parameters.
- Collected and made a custom image dataset using Intel RealSense depth cameras, achieving an 82.6% accuracy in stair height prediction and 81.4% accuracy in depth estimation.

Research Assistant

May 2024 - Present

Laboratory for Applied Informatics Research

Toronto, ON, Canada

- Advanced clustering and labeling for the PATTIE database using AI techniques, improving data management and retrieval.
- Enhanced searchability and user experience through refined data categorization.

Python Developer

Oct 2023 - Present

Bernhardt-Walther Lab

Toronto, ON, Canada

- Developed the Python version of the Mid-level Vision Toolbox to extract structural properties from images, including orientation, length, curvature, and junctions.
- Engineered and optimized computational tools to facilitate the study of mid-level representations in both biological and artificial vision systems.

Robotics Software Engineer

May 2022 - August 2022

Robotics and Manufacturing Automation Laboratory

Hamilton, ON, Canada

- Developed software for Collaborative Robots, leveraging machine learning and robotics dynamics to design a manipulator proficient in gesture recognition, obstacle avoidance, and object transfer to humans.

Computational Science Researcher

Jan 2022 - May 2023

Center for Computational Social Science

Hyderabad, India

- Analyzed politicians' social media use, revealing a strong correlation between Twitter engagement and followers.
- Identified fraudulent behavior of applications on Play Store, developing a model using BERT embedding and ML techniques for classification based on reviews.

Projects

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.

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.

Retinal Blood Vessels Segmentation

Computer Vision, Image Processing

- Built a pipeline for retinal vasculature detection using a morphological hessian-based approach and region-based Otsu thresholding for segmentation and denoising.

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.

Technical Skills

Programming Languages: C, C++, Python, MATLAB, R, JavaScript, Bash

Frameworks: PyTorch, TensorFlow, OpenCV, Robot Operating System (ROS), PyBullet

Tools and Databases: SQL, MongoDB, PostgreSQL, Docker, Kubernetes, AWS, GCP, Git, VS Code