Aravind Narayanan

+1(437)858-1308 aravindn1308@outlook.com aravind-n-774665144 aravind-3105.github.io/

Education

University of Toronto *Sep 2023 - May 2025**

Masters in Computer Engineering (Specialization: Data Analytics & Machine Learning), GPA: 3.84/4.0 Toronto, CA

- **Specialization:** Data Analytics & Machine Learning | **Courses:** NLP, Reinforcement Learning, Data Analytics, Cloud Computing, Parallel Programming, Imitation Learning for Robotics, Software Engineering
- **Achievements:** Presented deep learning-based depth estimation research at the Toronto Robotics Conference.

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

Bachelor of Technology in Electronics and Communication Engineering. GPA: 8.97/10 Hyderabad, India

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

Experience

Applied ML Intern *January 2025 - Present*

Vector Institute Toronto, ON, Canada

- Developed a multi-dimensional evaluation framework for a 31k-image dataset to assess social biases and perception errors in Vision-Language Models (VLMs), focusing on grounding, multilingual robustness, and intersectional bias.
- Authored and developed VLDBench, a benchmark for disinformation detection in Vision-Language Models; currently under peer review for ACL 2025 (preprint available on arXiv: **VLDBench**)

Research Assistant *May 2024 - Present*

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

- Developed ETL pipelines for ML-driven news clustering, leveraging PostgreSQL on GCP to store, process, and enhance content recommendations, while integrating an eye-tracking system to improve user interaction.
- Applied LLMs for clustering, summarization, and entity recognition, enhancing retrieval accuracy.

Computer Vision Intern *May 2024 - September 2024*

Neural Robotics Lab Toronto, ON, Canada

- Developed a machine learning-based pipeline for monocular depth estimation, achieved 82.6% accuracy in reconstructing 3D environments from monocular images.

Python Developer *October 2023 - May 2024*

Bernhardt-Walther Lab Toronto, ON, Canada

- Developed and optimized pyMLV, a Python tool for analyzing multivoxel pattern data in neuroimaging, improving performance and accuracy in extracting mid-level visual representations.

Computational Social Science Intern *May 2021 - May 2023*

Center for Computational Social Science Hyderabad, India

- Applied NLP (NER, text summarization and factual extraction) techniques to analyze social media trends, uncovering a link between content type and follower count to develop data-driven strategies

Technical Skills

Programming: Python, SQL, C++, JavaScript, MATLAB
ML & Big Data: TensorFlow, PyTorch, Scikit-learn, ETL, Feature Engineering, NLP
Databases & Cloud: PostgreSQL, MySQL, MongoDB, AWS, GCP, Docker
Tools & DevOps: Spark, Git, CI/CD, OpenCV, CUDA, Slurm

Projects

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

- Developed a GPT-based model for mood classification in song lyrics, achieving 85.2% accuracy with word2vec embeddings and deep learning, demonstrating NLP techniques for sentiment analysis.

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

- Analyzed and compared Deep Q-learning and Policy Gradient methods, demonstrating the stability and robustness of PPO and SAC in dynamic environments through hyperparameter tuning and reward shaping.

GPU-Accelerated Video Processing *Deep Learning, PyTorch, CUDA*

- Developed a real-time GPU-accelerated video processing pipeline that achieves significant speedups in edge detection, object detection, artistic effects, and video stabilization over CPU-based methods.

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

- Built a scalable AI system for analyzing respiratory and sleep data, leveraging cloud-based ML models on GCP to improve health insights and anomaly detection.