Atharv Nair

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Education

University of California San Diego — La Jolla, USA
Master of Science in Machine Learning and Data Science (ECE) — *Sep 2025 – Jun 2027 (Expected)*
- **Relevant coursework:** Reinforcement Learning, Statistical Learning, Probability and Statistics for Data Science

Indian Institute of Technology Hyderabad (IITH) — Hyderabad, India
Bachelor of Technology in Electrical Engineering ***GPA: 3.91/4*** — *Nov 2020 – May 2024*
- **Relevant coursework:** ML, DL, NLP, CV, Matrix Theory, Probability, Information Theory, Algorithms, Convex Opt.

Skills

ML/Frameworks PyTorch, TensorFlow, Transformers, OpenCV, ONNX, TensorRT/SNPE, ROS2
Programming Python, C/C++, MATLAB, SQL, Bash, HTML/CSS/JS
MLOps/Infra Docker, Kubernetes, Linux, Git, CI/CD, AWS (EC2,S3), vLLM, LangChain, LlamaIndex
Data/DB NumPy, Pandas, SciPy, Matplotlib, PostgreSQL, MongoDB, Streamlit

Work Experience

Netradyne — Bengaluru, India
Software Engineer — Machine Learning (Device Analytics) — *June 2024 – Aug 2025*
- **17% faster, zero drops:** Re-architected the video stack with a **producer–consumer** scheduler, async I/O, and frame-level buffering/priority queues; stabilized the device under multi-model load, removed GC/IO stalls, with **no precision loss**.
- **Shipped ADAS on Qualcomm (SNPE) and Nvidia(Tensorrt):** Passenger Seatbelt & Unsecured Package Detection; strengthened **Drowsiness** and **Forward-Collision Warning** for multi-camera, multi-model real-time use.
- **Systems consolidation & delivery:** Merged services into one **multithreaded** daemon (**–3% RAM**); ARM cross-compile (**GCC/LLVM**/Make); **Docker** CI on **EC2**; data ops with **S3**, **PostgreSQL**, **MongoDB**, **Snowflake**, **Git**.

Silicon Labs — Hyderabad, India
Software Engineer Intern — *May – July 2023*
- Implemented **Minstrel** adaptive rate control on **RS9116** Wi-Fi, improving rate–range behavior in field tests.
- Worked across embedded C, Linux drivers, IEEE 802.11 stack, and low-power IoT chip design.

Alog Tech — Hyderabad, India
Robotics Software Developer (Full-time) — *May 2023 – July 2023*
- Implemented completely Autonomous Navigation using ROS Navigation Stack including path planning
- Developed Motor Interface, YoLo based object detection, Custom Planner and Software Watchdog for the Robot.

Projects

LLM Test-Time Scaling using Process Reward Models
- Fine-tuned **Process Reward Models** (DreamPRM-style +/- tokens) to boost Lean4 **ATP** test-time performance with **Llama-3.2 3B**, 8k context, step-level reward probabilities.
- Built reproducible **Kubernetes** infra on SDSC/Nautilus **A100-80GB**: Pods/Jobs + YAMLs, **multi-GPU** (NCCL data-parallel), PVC-mounted datasets, containerized **PyTorch/PEFT (LoRA)**, automated checkpoints & W&B logging.

Deep Learning for Optical Coherence Tomography (OCT) Images — Dr. K. Vupparaboina, UPitt
- **RETFound OCT SSL + generative aug**: Fine-tuned on **1.8k** noisy B-scans → **Acc 0.77**/**AUC 0.80**; ablated **ViT/DINO/SupCon**; built **Pix2PixGAN**+latent diffusion (MONAI) conditioned on RETFound to synthesize B-scans. **IEEE VIP Cup @ ICIP 2023 2nd Runner-Up** (**Macro-F1 0.822**, Inception-v3).

Far-Field Speaker Verification on a Mobile Robot — K. Sri Rama Murthy, IITH
- **IEEE SP Cup 2024 (ICASSP) — 1st globally**: Adapted **ERes2Net** on **3D-Speaker** with targeted augments (RIR via Wiener, **MUSAN**, speed) and robot-ready scoring (**cosine**+**adaptive s-norm**); final leaderboard **minDCF 0.67**, **EER 8.93**; ablated models (WavLM/ECAPA/SE-ResNet/ERes2Net) and corpora (VoxCeleb/CN-Celeb).

Document-Level Text Simplification — Two-Stage Plan-Guided — Maunendra Desarkar, IITH
- Designed a **plan→generate** system: **RoBERTa** based classifier predicts edit ops (copy/rephrase/split/delete) which is prepended to the input before passing through a **two-stage transformer** (Summarizer→Simplifier)
- **SOTA on R-Wiki-auto**: **SARI 43.56**, **D-SARI 38.52**; beats *SIMSUM* (35.07/32.47) and *BART* (38.84/24.32).

Cosmic Ray Detection in Astronomical Images — Sumohana S. Channappayya, IITH
- Segmented cosmic-ray artifacts using a lightweight **TransUNet** tuned for faint streaks/small bright pixels in telescope stacks.
- **Up to +2% Recall** (fixed FPR) and higher **Dice** with **∼3% fewer params** vs. heavier baselines.

Publications

Du, K.; **Nair, A.R.**; Shah, S.; Gadari, A.; Vupparaboina, S.C.; Bollepalli, S.C.; Sutharahan, S.; Sahel, J.-A.; Jana, S.; Chhablani, J.; et al. *Detection of Disease Features on Retinal OCT Scans Using RETFound. Bioengineering*, 2024, 11, 1186. https://doi.org/10.3390/bioengineering11121186