Sanjith Muralikrishnan

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Education

Amrita Vishwa Vidyapeetham — **2023 – Present**
Bachelor of Technology in Computer Science and Engineering — *Coimbatore, India*

DAV Boys Senior Secondary School — **2022 – 2023**
Senior Secondary (High School) — *Chennai, India*

Professional Experience

Team Lead – Autonomous Subsystem — **Apr 2025 – Present**
Team Torpedo — *Coimbatore, India*

- Led the development of the AI subsystem for an autonomous ATV, integrating navigation and decision-making logic within a real-time robotics stack.
- Implemented **pathfinding algorithms** in **Carla**, achieving **95% route efficiency** in simulated unstructured terrain.
- Currently engineering an autonomous ATV for the national-level **SAEINDIA aBAJA** competition.

Projects

Handwriting Recognition Neural Network | *Python, PyTorch* **(GitHub)** — **Mar 2025**

- Designed a deep learning pipeline to interpret handwritten mathematical symbols as unicode with **94% accuracy**.
- Achieved this across **369 symbol classes** over a dataset of **168k+ images** using a **CNN** with **ReLU**, **Adam**, and regularization techniques.
- Integrated **learning rate scheduling** and **dropout** to improve convergence and generalization.

MomenTerm – Investment Advisor Web App | *Next.js, Yahoo Finance API* **(GitHub)** — **Mar 2025 – Present**

- Built a full-stack financial dashboard that delivers real-time market data and ML-based investment recommendations.
- Implemented client-side UI with **Next.js** and integrated live pricing through the **Yahoo Finance API**.
- Trained lightweight models to generate personalized insights based on user interaction history.

PocketDhamma – Offline Scripture Reader | *Flutter, Dart* **(F-Droid)** **(GitHub)** — **May 2025 – Jun 2025**

- Engineered an offline-accessible mobile app to browse and search the Dhammapada scriptures with responsive UI.
- Used **Flutter** to support theming, multi-device rendering, and performant static text search.
- Published on **F-Droid**, **IzzyOnDroid** as a **9.4MB APK** under **GPL-3.0**.

Research and Publications

Benchmarking Deep Learning Models for Surgical Instrument Detection — **Dec 2024 – Present**

- Developed a system to detect surgical instruments from clinical images, achieving up to **89.6% mAP**, aimed at reducing intraoperative errors through real-time tool recognition.
- Constructed a custom dataset of **1800+ images** via automated web scraping and manual curation; annotated and preprocessed using **Roboflow 3.0** for use with **YOLO** and **RF-DETR** models.
- Manuscript in preparation for submission to a computer vision conference, focused on comparative analysis of detection models for deployment in intelligent surgical environments.

Achievements

- **Runner-up**, **PyTorch Hackathon** (IETE Amrita, Mar 2025) – Built a handwritten symbol classifier CNN and competed among **250+ participants**.
- **LeetCode** – Solved **250+ algorithm problems**; ranked in the **top 5% globally**. **(LeetCode)** **(GitHub)**

Technical Skills

Languages: Python, C++, Rust, Java, Go, Haskell
AI/ML: PyTorch, NumPy, Pandas, YOLO, Jupyter Notebook
Web/App Dev: HTML/CSS, Flutter, Dart, Next.js, ReactJS, p5.js
DevOps/Tools: Git, Docker, Linux, AWS, Azure, Vim, VS Code, SSH