Advaith Sajeev

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Bachelor of Technology
Computer Science and Engineering
Amrita Vishwa Vidyapeetham, Coimbatore

About

I am a Computer Science undergraduate with strong skills in deep learning, computer vision and software engineering. My interests span deep learning, computer vision, generative models, and data-driven problem solving. Passionate about exploring new technologies and advancing my knowledge in the field.

Education

Degree	Institute	Board / University	CGPA/Percentage	Year
B.Tech CSE	Amrita School of Computing	Amrita Vishwa Vidyapeetham, Coimbatore	8.54 (Till 6th Sem)	2022-2026
Senior Secondary	Christ Nagar Hr.Sec School, Kowdiar	ICSE	94%	2022
Higher Secondary	Christ Nagar Hr.Sec School, Kowdiar	ICSE	96%	2020

Research Experience

- **Estimating Soil Moisture from Satellite Data** *March 2024 - Present*
  ***Tech**: PyTorch, TensorFlow, Excel, Pandas, Matplotlib* Amrita Vishwa Vidyapeetham, Coimbatore
  – Collaborating with INRAE, France, under the guidance of Dr. Amit Agarwal, Professor, TIFAC-CORE in Cybersecurity.
  – Engaged in research involving remote sensing, agriculture, and machine learning.
  – Leveraging advanced satellite data processing and machine learning techniques to address critical challenges in soil moisture prediction and plant life cycles.

- **Text-Prompted 4D Mesh Character Animation using GNNs and Diffusion Models** *November 2024 – August 2025*
  ***Tech**: PyTorch, PyTorch Geometric, Trimesh* Amrita Vishwa Vidyapeetham, Coimbatore
  – Contributed to research on 4D mesh generation using Graph Neural Networks (GNNs) and diffusion models as part of a professional research elective.
  – Developed a latent graph diffusion model to overcome limitations in handling meshes with varying topologies.
  – Designed a pipeline integrating GNN autoencoders with diffusion models for text-prompted 4D mesh generation.
  – Explored applications in animation and game development by creating a versatile, generalizable approach to dynamic mesh generation.

- **Label-Free Coconut Tree Counting** *June 2025 - August 2025*
  ***Tech**: PyTorch, OpenCV* Amrita Vishwa Vidyapeetham, Coimbatore
  – Built an image-processing + deep-learning pipeline to estimate coconut tree counts without per-tree annotations, avoiding costly dot/box labels.
  – Was able to successfully get the average count of trees given a very large area.

- **Final Year Project — Self-Driving Cars with Small Language Models** *September 2025 – Present*
  ***Tech**: Qwen-0.5B LLM, Multimodal Encoders (LiDAR + Multi-axis Camera), Edge AI* Amrita Vishwa Vidyapeetham, Coimbatore
  – Experimenting with **edge-focused autonomous driving** using a lightweight Qwen-0.5B decoder paired with encoders for multimodal inputs.
  – Designed pipelines for real-time **waypoint prediction**, **scene understanding**, and **object detection** (bounding box prediction) from LiDAR and camera data.
  – Exploring two architectures:
    * *Parallel multi-encoder design* — separate encoders for LiDAR and multi-axis camera, integrated via the decoder.
    * *Single fusion encoder* — fuse LiDAR and camera into a unified encoder trained on RGB–point cloud data, reducing compute overhead and improving inference speed.
  – Implementing a **safety system** to predict future states of surrounding objects so generated waypoints are safe to execute — addressing gaps in many current systems.
  – Optimizing the entire solution for **local, real-time inference** to enable closed-loop autonomous driving on resource-constrained edge hardware.

Experience

- **Research Intern** *May 2025 - June 2025*
  ***Tech**: Deepstream, NVIDIA Jetson Orin* DRDL, DRDO, Hyderabad
  – Worked on object detection models tailored for defense-specific applications using a custom military dataset.
  – Implemented and fine-tuned YOLOv11 and RT-DETR architectures for high-accuracy detection and real-time inference.
  – Deployed the trained models on NVIDIA Jetson Orin, focusing on low-latency, hardware-accelerated performance for real-world military use cases.

Projects

- **DEEP FAKE DETECTION** *Jan 2024 - Apr 2024*
  CSE(AI) / Tech: ***Pytorch*** *and* ***OpenCV*** **Github**
  – The application targeted video deepfakes, using multiple detectors with unique techniques. Results were intelligently combined by a model that assigned weights based on each detector's historical performance on a custom-prepared dataset.

- **DDPM Image Generation — Deep Learning Coursework** *2024*
  Tech: ***PyTorch, Denoising Diffusion Probabilistic Models (DDPMs)*** **Demo Repository**
  – Implemented a **DDPM-based generative model** for image synthesis as part of deep learning coursework.
  – Demonstrated the underlying techniques behind **deepfake generation**, enabling fine-tuning on a handful of images of a target person to produce new, realistic samples.
  – Showcased diffusion-based generative modeling and its applications in media synthesis and AI ethics demonstrations.

- **Adobe India Hackathon — Team Starks (Connecting the Dots)** *Jan 2025*
  Hackathon Project / Tech: ***Qwen2.5-0.5b (Int8, llama.cpp), YOLOv8n*** **GitHub**
  – Built an intelligent, lightweight, **CPU-only offline system** to transform static PDFs into dynamic, structured, persona-aware knowledge artifacts.
  – Designed a **layout-aware Small Language Model (SLM)** using **Qwen2.5-0.5b (Int8 quantized)** on **llama.cpp** for efficient low-resource inference.
  – Integrated **2× YOLOv8n models** (distilled with PP-DocLayout-L + a custom outline detector), **SentenceTransformers** for semantic search, and **K-means clustering** for hierarchical structuring (H1, H2, H3).
  – Enabled **semantic retrieval + summarization** by ranking the top 5 relevant sections in embedding space, then summarizing them via the SLM.
  – Optimized the pipeline to meet hackathon size limits (**200 MB in Round 1A**, **1 GB in Round 1B**), achieving high portability and efficiency. The system processed 10–15 documents of 50 pages each in under one minute.

Technical Skills

- **Programming Languages**: Python, Java, C++, C
- **DeepLearning Frameworks**: Pytorch, Pytorch3D, TensorFlow, Scikit-Learn,
- **Data Analytics Tools**: NumPy, Pandas, Matplotlib, Seaborn
- **Image processing Libraries**: MediaPipe, OpenCV
- **LLM Techniques**: Prompt Engineering, Model Fine-tuning, Quantization, Knowledge Distillation
- **Accelerated Computing**: CUDA programming for GPU-accelerated deep learning and high-performance computing

Certifications

- **Advanced Learning Algorithms by DeepLearning.AI** by DeepLearning.AI
- **Supervised Machine Learning: Regression and Classification** by DeepLearning.AI

Achievements

- **1st place in Nestria Jan Built Hackathon** ,Built a deep fake detection website, **Link** *April 2024*