

Ashwath Vaithinathan Aravindan

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EDUCATION

University of Southern California | **GPA: 4/4**

Aug 2024-May 2026

Master of Science in Computer Science

Amrita Vishwa Vidyapeetham | **GPA: 9.57/10**

Oct 2020-Jun 2024

Bachelor of Technology in Computer Science and Engineering

Gold Medalist (Rank 1st/421)

EXPERIENCE

Research Scientist Intern

May 2025-Aug 2025

IBM Research

Yorktown Heights, NY

- Optimized the [Responsible Prompting API](#), achieving 6x faster recommendation performance; Built a multi-turn chat demo, which was published as a demo paper at IHC 2025. Reflection paper on opensource community outreach in review at CHI 2026.
- Fine-tuned Granite 2B and Llama 8B LLMs using SFT and RLVR to provide reliable confidence scores along with generated outputs. Improved Expected Calibration Error and AUROC scores by 50% on HotPotQA w.r.t SoTA baseline techniques.

Research Intern

Oct 2024-Present

Information Sciences Institute, USC (guided by [Dr. Mayank Kejriwal](#))

Los Angeles, CA

- Proposed an [Iterative Programmatic Planning \(IPP\)](#) framework for refining LLM planning, achieving upto 116% performance gains over direct prompting with significant cost savings, establishing new SoTA results on [GRASP](#) and [MiniGrid](#) tasks.
- Investigating LLM reliability through entropy-based uncertainty estimation, focussed on token entropy and answer confidence.

Research Intern

Jan 2024-Jul 2024

CREB, Universitat Politècnica de Catalunya | [Project](#)

Remote

- Implemented a synthetic data generator and conducted a comparative study of CNNs vs. Vision Transformers with attention mechanisms for Retinopathy of Prematurity (RoP) detection and localization, under the guidance of [Dr. Raul Benitez](#).

Research Intern

Aug 2023-Jun 2024

Amrita x Sony - SSUP

Coimbatore, India

- Designed a low-cost control system for solar food drying in small-scale agriculture and cottage industries, integrating machine learning, embedded programming, and psychrometric modeling; achieved 10-15% improvement in drying efficiency.

Software Engineering Intern | (*Spotlight Recognition for exemplary performance*)

May 2023-Jul 2023

Intuit

Bangalore, India

- Contributed to the revamp of ItsDeductible - a product of Intuit for tracking charitable donations with over 200k users.

PUBLICATIONS (*Selected*)

[1] Do VLMs Have Bad Eyes? Diagnosing Compositional Failures via Mech. Interp. | [eXCV workshop ICCV'25](#) | [Paper](#) | [Code](#)

[2] Code-Driven Planning in Grid Worlds with Large Language Models | [arXiv](#) | [Paper](#) | [Code](#)

[3] Sealing The Backdoor: Unlearning Adversarial Text Triggers In Diffusion Models | [arXiv](#) | [Paper](#) | [Code](#)

[4] TS-CNN: a three-tier self-interpretable CNN for multi-region medical image classification | [IEEE Access](#) | [Paper](#) | [Code](#)

[5] Building of Computationally Effective DL Models using Attention-Guided KD. | [IEEE ICoAC](#) | [Paper](#) | [Code](#)

OPEN-SOURCE CONTRIBUTIONS

Helmholtz Analytics Toolkit (Heat) | [Project](#)

Jun 2022-Jun 2024

- Developed the new sparse module for Heat - a distributed tensor framework for HPC systems with 50k+ downloads.
- DCSR_matrix and DCSC_matrix display about 76% improvement in performance in place of dense matrices.

MuseScore - Google Summer of Code'21 | [Project](#)

May 2021-Aug 2021

- Designed the Chord Symbol Style Editor, reducing custom XML file usage by 80% and enhancing accessibility.

PROJECTS

NeoMorpheus | [Project](#) | *Challenge Winner in Cerebral Beach Hackathon*

Oct 2024-Nov 2024

- Developed an AI-powered cybersecurity education platform that generates personalized courses for both general public and professionals, leveraging multiple LLM models (WhiteRabbitNeo, OpenAI GPT-4o) and RAG technology.

SmartVidIndex | [Project](#)

Jul 2024-Aug 2024

- Built an intelligent video index that can answer user queries and retrieve relevant snippets from a video collection.

SKILLS

Deep Learning: PyTorch, transformers, trl, peft, DeepSpeed, datasets, Tensorflow & Keras, pandas, numpy, matplotlib, Python

Web/App Development: React.js, Next.js, Redux, GraphQL, Flask, Langchain, Qdrant, Firebase, SQL, TypeScript, JavaScript