Aravinth K

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Education

Madras Institute of Technology, Anna University — Chennai, India
B.E. Computer Science and Engineering (CGPA: 8.86, 5th Semester) — *Aug 2024 – Present*

Indian Institute of Technology Madras — Chennai, India
B.S. Data Science and Applications (CGPA: 8.53) — *May 2024 – Present*

Experience

University of Illinois Urbana-Champaign — Remote
Software Summer Research Intern — *Jun 2026 – Aug 2026*

- Worked under Saikat Dutta, Assistant Professor of Computer Science, Cornell University.
- Conducted research on Physics Induced Neural Networks and other Scientific Machine Learning (SciML) Frameworks.
- Developing Python-based experimentation pipelines for RL-driven test generation and defect analysis in scientific software.

Projects

AI Redaction System | *Python, YOLO, OpenCV, PaddleOCR, Whisper, Llama, Azure*

- Developed a multimodal AI pipeline to automatically detect and redact sensitive information across documents, images, videos, audio, and text using computer vision and large language models.
- Integrated YOLO for object detection, PaddleOCR for OCR, Whisper for speech transcription, and LLM-based reasoning to perform context-aware redaction beyond rule-based approaches.
- Implemented synchronized frame-level video processing with timestamp-aligned audio transcription for consistent multimodal inference.
- Containerized and deployed the application on Azure, optimizing backend inference for scalable production workloads.

AI Virtual Teaching Assistant | *Python, FastAPI, FAISS, OpenAI Embeddings*

- Designed and developed a Retrieval-Augmented Generation (RAG) system using OpenAI embeddings, FAISS vector search, and FastAPI for real-time academic question answering.
- Built automated preprocessing pipelines to scrape, clean, normalize, and convert Discourse forum discussions into structured Markdown enriched with contextual metadata.
- Engineered semantic indexing, document chunking, and metadata-aware retrieval strategies to improve retrieval accuracy and reduce hallucinations.
- Exposed the retrieval engine through REST APIs optimized for low-latency embedding generation and vector search.

Medical Centre Automation System | *MongoDB, Express.js, React, Node.js*

- Developed a production-ready MERN healthcare management platform supporting patient registration, appointments, prescriptions, pharmacy, and clinical workflows for 1,000+ students.
- Designed secure RESTful backend services with authentication, role-based authorization, validation, and persistent storage for medical record management.
- Implemented normalized database schemas and workflow automation for doctors, receptionists, nurses, pharmacists, and administrators.
- Self-hosted the application on a Linux server using Nginx, enabling secure reverse proxying and scalable deployment.

Technical Skills

Languages: Java, Python, C++, JavaScript, SQL
Frameworks: React, Node.js, Express.js, Spring Boot, FastAPI, Flask
Machine Learning: PyTorch, OpenCV, Transformers, YOLOv8, PaddleOCR, Whisper, FAISS, OpenAI Embeddings
Databases: MongoDB, SQLite, Firebase
Cloud & DevOps: Azure, Docker, Linux, Git, Nginx, Postman