

Akash A

7624894376 | 062akash062@gmail.com | www.linkedin.com/in/akash0620 | github.com/AkashXII

EDUCATION

St Jospeh's Engineering College

Bachelors Of Engineering In Computer Science And Data Science

Mangalore

2023-2027

EXPERIENCE

Member – Sceptix Technical Club

St Joseph's Engineering College

November 2025– Present

- Participated in internal coding events such as **Rain of Code** and club-organized hackathons, working and building with fellow peers.
- Observed and explored different approaches to solving programming challenges during club events.

PROJECTS

DeepReef - Multimodal Coral Bleaching Detection System [GitHub] | OpenCV, FastAPI, React, XGBoost

- Built an **end-to-end multimodal coral bleaching detection system** combining **CNN-based image classification** with **XGBoost environmental modeling**, fused via **weighted late fusion**.
- Fine-tuned a **NOAA marine science foundation model (YOLO11n-cls)** on **922 coral images** using a custom **underwater DIP preprocessing pipeline** (blue-shift correction, bilateral denoising, CLAHE contrast enhancement).
- Engineered **10 domain-specific environmental features** and trained a **XGBoost model**, incorporating a **physics-based NOAA bleaching threshold prior** to improve prediction stability.
- Integrated **Groq LLM (LLaMA-3.1-8B)** for real-time **plain-language explanations** and deployed the system via a **React frontend** with a **FastAPI backend**, including live pipeline stage visualization.

DocXBud - AI-Powered Study Assistant [GitHub] | React, FastAPI, LangGraph, LangChain, FAISS, Groq

- Architected an **agentic RAG pipeline** using **LangGraph** with conditional routing across four study modes (Q&A, Flashcards, Quiz, Summary), implementing LLM-based multi-query expansion with deduplicated FAISS retrieval to improve cross-topic answer accuracy.
- Engineered a **semantic search pipeline** using sentence-transformers embeddings and a FAISS vector store with recursive text chunking, grounding all LLM responses strictly in uploaded lecture material via LangChain retrieval.
- Developed a **production-ready REST API** using FastAPI with JWT authentication, bcrypt encryption, rate limiting, and MongoDB Atlas persistence for user sessions, document metadata, and resumable chat history.

InferMesh - Distributed GPU Compute Network [GitHub] | TypeScript, Python, TCP/IP, Distributed Systems

- Developed **InferMesh**, a **distributed AI inference platform** in **TypeScript** and **Python**, enabling **peer discovery**, **GPU resource advertisement**, and **remote job execution** across networked nodes.
- Designed a custom **TCP communication protocol** with **length-prefixed message framing**, supporting **peer handshakes**, **heartbeats**, **job routing**, and **fault detection**.
- Implemented **resource-aware scheduling** and **heartbeat-based failure monitoring**, automatically selecting the highest-capacity peer and removing unreachable nodes from the network.

ACHIEVEMENTS

- Selected among the **Top 40 teams** in the **Winter Hackathon** organized by Google Developer Club and Sceptix Technical Club.
- Participated and selected among the **Top 20 teams** in the **Udbhava Hackathon** hosted by Nitte University.
- Earned the **50 Days LeetCode Badge** for maintaining a consistent coding practice streak.

TECHNICAL SKILLS

Languages: Python, TypeScript

Frameworks & Libraries: React, Node.js, FastAPI, Express, LangChain, LangGraph, TensorFlow, Next.js

Databases: MySQL, MongoDB

Developer Tools: Git, GitHub, Visual Studio Code, Jupyter Notebook