

## Education

**Einstein College of Engineering***B.E., Computer Science and Engineering (CGPA: 8.83)*

Tirunelveli, India

2019 - 2023

**Government Hr. Sec. School***Higher Secondary School Examination (Score: 87%)*

Tenkasi, India

2019

## Programming Skills

*Deep Learning Frameworks: PyTorch, NumPy**Languages: Python, Java, JavaScript, C**Databases: MySQL, MongoDB**Web Development Frameworks: FastAPI, ReactJS, NodeJS, Express.js**Operating Systems: Windows, macOS, Linux (mainly Ubuntu)**Version Control Systems: Git*

## Work Experience

**Moative***AI/ML Engineer*

Chennai, India

June 2025 - Present

- Developing Full Stack AI Systems, encompassing everything from model prototyping to scalable cloud deployment
- I developed a web-based AI platform that automates CEQA permitting by integrating OCR, advanced NLP, and vector-based document analysis. Leveraging Google's Gemini API, the system classifies uploaded PDFs into CEQA categories (Exempt, ND, MND, EIR), generates justification reports, and flags environmental concerns. I built a FastAPI backend with Gemini-powered classification, real-time caching, and PDF generation, alongside an interactive frontend with traffic-light status indicators, map-based location analysis, and a chatbot assistant. The platform significantly accelerates environmental compliance review for consultants, agencies, and developers.
- I engineered a graph-based clinical trial analysis platform focused on Antibody-Drug Conjugates (ADC), integrating Neo4j, FastAPI, and Google Gemini AI to enable natural language querying over pharmacokinetic and safety datasets. The system dynamically generates Cypher queries from plain-English questions, visualizes clinical parameters (AUC, Cmax, AE grades) via interactive dashboards, and provides AI-generated insights. I deployed it into AWS.

**Zoho Corporation***Member Technical Staff, Zoho Desk*

Tenkasi, India

April 2024 - May 2025

- Developing UI and AI systems for Zoho Desk.
- Worked on a Retrieval-Augmented Generation (RAG) system using FAISS for document retrieval and a HuggingFace LLM for improved responses. Also developing production-grade JavaScript and ReactJS features.

**Zoho Corporation***Member Technical Staff, ZLabs Speech Profiling*

Trichy, India

Jan 2024 - April 2024

- Learned about Audio Feature Extraction
- I conducted audio classification using CNNs, achieving peak accuracy. I addressed challenges with varying sampling rates and gained valuable insights into audio engineering and feature extraction.

**Zoho Corporation**

Member Technical Staff, ZLabs Intelligent Document Processing

Tripur, India

Jun 2023 - Dec 2023

- Developed A Fewshot Doc2Vec Model
- *I began my research with ResNet-50 and then transitioned to DiT, a vision transformer pretrained on a document dataset. We extracted document embeddings and performed few-shot training using Triplet Loss. With well-labeled data, we achieved a similarity search accuracy of 100%. Later, in my research, I discovered interesting insights, such as classification models sometimes performing like few-shot models and vice versa. Finally, I conducted multimodal training by combining visual features from ResNet and textual features from BERT, resulting in strong generalization.*

**Zoho Corporation**

Project Trainee, ZLabs Intelligent Document Processing

Coimbatore, India

Jan 2023 - Jun 2023

- Learned Deep Learning Computer Hardwares, Backend Frameworks and Revised Python
- *I meticulously learned deep learning, which sparked my interest in creating small books (<https://arihara-sudhan.github.io/books>). I successfully trained small neural networks and tackled a few-shot classification task, which I resolved using contrastive loss.*

**Projects****AI Powered MediKit**

- Revolutionizes healthcare diagnostics by leveraging Vision Transformers (ViTs) for precise medical image analysis.
- Overcomes CNN limitations by capturing fine-grained medical features with superior accuracy.
- Features Heartbeat Analysis using Mel-Frequency Cepstral Coefficients (MFCC) to classify heartbeats and detect abnormalities.
- Supports few-shot classification for tablet identification, minimizing retraining needs and improving adaptability.
- Includes a Herbal Solution feature that bridges modern AI with traditional medicine by suggesting natural remedies.
- Combines precision, innovation, and accessibility to set a new benchmark in AI-driven medical solutions.

**MindKural - RAG System**

- Developed a conversational AI bot using LangChain to answer queries based on Thirukkural, the timeless Tamil literary masterpiece.
- Utilized FAISS for vector embeddings and similarity search to enable efficient retrieval.
- Enhanced responses using Retrieval-Augmented Generation (RAG) with Falcon LLM.
- Transformed Thirukkural's wisdom into a knowledge framework that informs and heals.

**Grouped Detection of Objects**

- Utilized the YOLO algorithm to detect objects in images accurately.
- Cropped regions of interest and applied a Swin Transformer-based few-shot network for classification.
- Implemented K-means clustering with the Elbow Method to optimize object grouping.
- Deployed a scalable real-time prediction microservice using FastAPI.

### **Fewshot Classify Anything Model**

- Performs similarity searches on stored embeddings of images.
- Uses a Swin Transformer as the backbone and employs triplet loss for training embeddings.
- Efficiently classifies new inputs by referencing a few saved embeddings in an index.

### **Next-Word Prediction using Bigram Model**

- Implemented a probabilistic language model that predicts the next word based on the previous word using a bigram approach.
- Utilized joint probability and conditional probability to compute word sequences.
- Demonstrated real-world text generation applications by starting with seed words and generating coherent sentences.

### **Dialect Classification using Naïve Bayes**

- Built a text classification model for dialect detection using the Naive Bayes algorithm.
- Employed the Bag of Words approach to store word frequencies for classification.
- Used Laplace Smoothing to handle zero probabilities and prevent model breakdown.
- Optimized for efficiency by working in log-space to prevent underflow when multiplying small probabilities.

## **Achievements/Activities**

- Educating Peers at Zoho Desk on Client Technology *I mentor my team on JavaScript internals, the functional programming paradigm, ReactJS, and TypeScript.* (SEP 2024)
- Learning NLP and Speech Processing nightly at a study group meet (DAILY)
- Taught Basic Machine Learning to Students *Guided expert students from Coimbatore, Tirunelveli, and Madurai on Multi-Layer Perceptron and CNN via Google Meet.* (OCT 2024)
- Taught MERN Stack Development to Students *Conducted weekend sessions at Einstein College of Engineering on MERN Stack Development.* (DEC 2024)
- Session on "Basics of AI" at Sri Sairam College of Engineering, Chennai *Taught of Neural Networks, Activation and left with a induced interest on AI among the students.* (FEB 2025)
- Session on "Meet AI" at Kamaraj College of Engineering and Technology, Virudhunagar *Taught AI fundamentals, fostering curiosity and learning to inspire an AI-powered South.* (JAN 2025)
- Session on "On Technology and Rural Development" at AKY Polytechnic College, Nellai *Discussed technology's role in rural development, education, societal changes, and self-improvement.* (SEP 2024)
- Qualified for the final round of Medecro.ai's Hackathon *Developed AI-powered MediKit, a bundle of AI solutions for medical problems such as heartbeat analysis, tumor detection, and cell classification.* (AUG 2024)
- Qualified for the final round of the Atheneum Hackathon, IGDTUW, New Delhi *Proposed Smart Education System with OCR-based test evaluation, virtual pen, virtual quiz, and face recognition-based attendance.* (AUG 2022)
- Talent Search Examination, JP College of Engineering, Tenkasi *Secured 1st Prize for excellence in Mathematics and Science.* (FEB 2017)
- Yuva Shri Kala Bharathi Award, Bharathi Yuva Kenthra, Madurai *Recognized for outstanding performance in proficiency and arts.* (JAN 2018)
- Thirukkural Literature Explanations *Dedicating my evenings to writing detailed explanations for each Thirukkural.* (OCT 2024)
- Aladi Aruna Merit Scholarship, Einstein College of Engineering, Tirunelveli *Awarded a scholarship for securing a top rank in academics.* (FEB 2017)

- 1st Prizes in Paper Presentation, Web Designing, Code Debugging *Rohini College of Engineering, Kanyakumari - National Level Technical Symposium. (MAR 2022)*
- 1st Prizes in Paper Presentation and Web Designing Competitions *PSN College of Engineering, Tirunelveli - National Level Technical Symposium. (APR 2022)*
- 1st Prizes in Paper Presentation, Web Designing, and Technical Quiz *Thamirabarani Engineering College, Tirunelveli - National Level Technical Symposium. (MAY 2022)*
- Best Project Presentation in Mini Project Expo for III-year students *Developed an AI-Based Student Service System at Einstein College of Engineering.*