Ariharasudhan

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Education

Einstein College of Engineering Tirunelveli, India
B.E., Computer Science and Engineering (CGPA: 8.97) *2019 - 2023*

Government Hr. Sec. School Tenkasi, India
Higher Secondary School Examination (Score: 87%) *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 Chennai, India
AI/ML Engineer *June 2025 - Present*

- Built a HIPAA-compliant end-to-end automation pipeline for revenue cycle management using UiPath that identifies claims requiring status updates, automates portal navigation to retrieve claim status, leverages LLMs to generate concise summaries, and securely updates the system, processing 2,500+ claims uninterruptedly and reducing a one-month manual process to two days.
- Integrated ElevenLabs conversational AI with an MCP server to enable natural interactions for water services such as consumption tracking, usage analytics, and outage reporting.
- Developed a full-stack AI-powered system to detect and manage account overlaps between our company and partners, helping sales and partnership teams identify, score, escalate, and resolve high-value opportunities. Built with Python, FastAPI, SQLAlchemy, and a modern vanilla JS web interface, the platform enables customizable overlap scoring, team hierarchy-based Slack escalations, and LLM-powered (e.g., Gemini) generation of professional emails and Slack messages using prompt engineering. I designed a responsive UI for configuring scoring weights, managing internal teams, and tracking resolution status. The system includes database-backed state management and escalation fallback automation (e.g., personalized partner emails) to ensure no opportunity goes unattended—transforming latent overlaps into revenue-driving actions.
- 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.

Ariharasudhan - Resume

Zoho Corporation   Tenkasi, India

Member Technical Staff, Zoho Desk   *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   Trichy, India

Member Technical Staff, ZLabs Speech Profiling   *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   Tripur, India

Member Technical Staff, ZLabs Intelligent Document Processing   *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   Coimbatore, India

Project Trainee, ZLabs Intelligent Document Processing   *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

CRISPR In Silico: LLM

- Addresses the major safety concern in CRISPR-Cas9 gene editing: unintended off-target cuts across the genome.
- Uses an LLM-based system to analyze DNA sequence similarity and proactively flag risky regions.
- Simulates Cas9 cutting activity in silico to predict biological outcomes of potential off-target edits.
- Helps prevent harmful mutations that could affect essential genes or regulatory elements.
- Improves on existing tools by modeling both the likelihood of a cut and its biological impact.
- Establishes a foundation for integrating synthetic simulations into real-time gene editing workflows for safer designs.

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

- Deep Learning with TensorFlow | Sri Sairam Engineering College, Chennai *Conducted a hands-on session on tensors, neural networks, CNNs, and backpropagation, inspiring students through interactive learning and exploring AI/AR/VR innovations at the Startup Incubation Centre.* (March 2025)

- Prompt Engineering and Generative AI | Sri Sairam Engineering College, Chennai *Led a session on Neural Networks, RAG, and Agentic AI, sharing knowledge with enthusiasm, engaging students in practical AI concepts, and fostering curiosity and excitement for AI applications.* (May 2025)

- Deep Learning and LLM AI Workshop | Kongu Engineering College *Conducted a full-day session exploring deep learning in the morning and LLM/AI APIs with RAG in the afternoon, engaging students through interactive learning, deep concept exploration, and practical demonstrations. Thanks to the enthusiastic students for their feedback and curiosity, making the day memorable despite my seasonal fever!* (November 2025)

- Educated Peers at Zoho Desk on Client Technology *I mentored 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 "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)

- 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, and Technical Quiz *Rohini College of Engineering, Kanyakumari (MAR 2022); PSN College of Engineering, Tirunelveli (APR 2022); Thamirabarani Engineering College, Tirunelveli (MAY 2022) - National Level Technical Symposia.*

- Best Project Presentation in Mini Project Expo for III-year students *Developed an AI-Based Student Service System at Einstein College of Engineering.*