Jahan Ravi

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Education

Anna University, Chennai, India
B.E in Computer Science Engineering | 2022 – 2026
Indian Institute of Technology, Chennai, India
B.S in Data Science (hybrid Degree Program) | 2024 – 2028

Experience

Nanyang Technological University (NTU), Singapore | Research Intern | Dec 2024 – April 2025
Tech Stack: ColonSegNet ,Efficientnet ,Vision Transformer (ViT), Unet 3+ , Densenet, Resunet,Deeplabv3, UTransformer , VGG16, InceptionV3, PyTorch , gemini-1.5-flash , OpenCV, pycocotools

- Conducted research on nanoparticle analysis using SEM (Scanning Electron Microscope) images.
- Built and fine-tuned deep learning models to classify and segment nanoparticles and measure their diameters, including calculating both mean and standard deviation of particle diameter per image.
- Utilized SOTA architecture such as Vision Transformers, U-Net, and Deeplabv3 , UTransformer , Unet 3+ for precise analysis and image segmentation, achieving **97% accuracy on validation dataset**.

IIT Guwahati - Multimedia Lab | Research Intern | Nov 2024 – Present
Tech Stack: Latent Diffusion Model (LDM), Variational Autoencoder (VAE) , U-Shape Transformer, PyTorch, Swin Transformer, Structure-aware Lightweight Transformer (Star)

- Enhanced underwater images by improving **image resolution**, sharpness, and overall visual fidelity.
- Developed and trained deep learning models using PyTorch; utilized **diffusion models** and **transformer-based architectures** to restore fine details and improve perceptual clarity.

Savyai.io | Research Intern | Oct 2023 – Aug 2024 | Referee Letter
Tech Stack: RLHF, LoRA, QLoRA, LangChain, Langgraph, Word2Vec, LLaMA 3.1, Claude 3.5 Sonnet, Gemini 1.5 Pro, RAG, Transformers

- Conducted research on various AI frameworks and models for enhancing conversational systems in tourism-focused LLM RAG and agents.
- Fine-tuned large language models using LoRA and QLoRA for domain-specific dialogue optimization and investigated frameworks' potential to improve user experience.
- Worked extensively with **word embeddings** using Word2Vec and fine-tuned embedding models to capture semantic relationships, improve context handling, and enhance response quality.

Projects

LLM-Based Agents Equipped with Networking and Penetration Testing Tools
Role: Researcher / Developer | Tech Stack: Scapy, Nmap, Paramiko, ftplib, snmpy, pycurl, Metasploit, PyShark, GPT-4o Mini, Langgraph

- Developed LLM-based agents integrated with networking and penetration testing tools for automated security assessments.
- Leveraged tools like Scapy, Nmap, and Metasploit to enhance network analysis and vulnerability exploitation through prompts.
- Developed streamlit interface for the application and published it as a open source software

Air Quality Monitoring and Prediction System
Role: Developer / Researcher | Tech Stack:Intel-extension-for-tensorflow , OpenAPI-oneDNN, Transformer, Llama 3.1, Pandas, Matplotlib ,modin,React, FastAPI,

- Developed a time-series based AQI prediction by building BiLSTM and Transformer architecture to predict AQI values and identify pollution , reduced the training time by efficient GPU optimization
- Utilized GAN for Data generation . Integrated real-time monitoring, pollutant-level analysis,and a rag-llm for industry regulation and pollution mitigation strategies.

Adapt-Agent Using Liquid Neural Networks and Reinforcement Learning Algorithms
Role: Researcher / Developer | Tech Stack: Keras, OpenAI Gym, StableBaselines3, PyTorch, OpenCV

- Developed an adaptive agent using liquid neural networks and Proximal Policy Optimization and Soft Actor-Critic, for dynamic decision-making on simulated environments.
- Later tried to integrate computer vision tools for interactive training and environment exploration.

Achievements

- **TurboRL** (NIT Warangal-National Level): Reinforcement Learning Event Winner (1st Place)-Leader
- **Ethos'24** (IITG - National Level) : Hackathon Runner-up (2nd Place) - Leader
- **Neuramatrix** (National Level) : CNN Event Winner (1st Place) - Leader

Tech Stack and Skills

- **Programming Languages:** Python, JavaScript, Bash, Java, C++, C, Rust, Go, Assembly, Flutter, Dart.
- **Machine Learning Libraries:** PyTorch, TensorFlow, Keras, SciPy, NumPy, Jax, Scikit-learn, Polars, Pandas, Matplotlib, Seaborn, LangChain, LangGraph, Transformers, OpenAI Gym, Stable-Baselines3, Keras-rl2, PyTesseract, OpenCV, YoloV8, Arima.
- **DevOps:** Git, GitHub, Docker, Kubernetes, Splunk, Hadoop.
- **Web Development:** HTML5, CSS, TailwindCSS, React.js, FastAPI, Django.
- **Databases:** MongoDB, SQLite.
- **Technical Skills:** Image Processing, Time Series Prediction, Regression, Classification, Signal Processing, Transfer Learning, Financial/Quant Data Analysis, PEFT, RLHF, LLM Agent Tools, Computer Vision, Reinforcement Learning Agent, Bash Scripting, Web Development, Network Analysis, CAD ,Penetration Testing, Web Scraping, Low-Level Programming, FPGA.
- **General Skills:** Emotional Intelligence, Communication Skills, Leadership, Networking.

Volunteering

Codesapeins
Delivered deep learning lectures, organized technical events, and contributed to open-source projects as part of an alumni-led student community.

R.M.K Engineering College – E-Research Paper Platform Contribution | Referee Letter
Tech Stack: React, FastAPI, Llama3.1, Tailwind CSS, SQLite, Docker
Developed a website for accessing e-research papers published by the college's professors, streamlining research discovery.

FOSS United – Open Source Contributor
Tech Stack: LangChain, FAISS, LLaMA 3.1, React, FastAPI, Firebase
Contributed to the development of an LLM-based MCQ generator to enhance personalized assessment in education. Each quiz question was generated uniquely per student using LLaMA 3.1.