SANJAY. R

Generative AI Engineer | Applied Research Engineer

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Generative AI / Applied Research Engineer with hands-on experience designing and deploying multimodal AI systems spanning computer vision, speech, and large language models. Proven ability to translate research concepts into production-ready pipelines, including real-time perception, voice-based AI assistants, and RAG systems under hardware and latency constraints. Strong background in experimentation, model optimization, and cross-functional collaboration within automotive and applied AI R&D environments.

Education

B.Tech (Artificial Intelligence and Machine Learning) **(2020-2024)**
HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY **CGPA – 8.0/10.0**
Related course work: Machine Learning, Deep Learning Neural Networks, Supervised Learning, Satellite Image Processing, Data Analytics, and Computer vision, NLP

AWS (AI & ML Scholarship) - Nanodegree
AI Programming with Python **(Jun 2024 – Oct 2024)**
Project 1: Used Pre-trained Image Classifier to identify Dog Breeds.
Project 2: Image Classifier model to predict new image using the trained model in flower dataset.

Technical Skills

- **Generative AI & LLMs:** Prompt engineering, Retrieval-Augmented Generation (RAG), multimodal LLM integration, LLM orchestration (LangChain), local & cloud LLM deployment (Ollama, Hugging Face).
- **Machine Learning & Data Science:** Supervised & unsupervised learning, model evaluation, feature engineering, statistical analysis.
- **Computer Vision & AI Systems:** Object detection (YOLO-Family), image & video processing, OpenCV-based pipelines, real-time inference
- **Libraries & Frameworks:** PyTorch, TensorFlow, Keras, Scikit-learn, Pandas, NumPy, Polars, Hugging Face Transformers
- **GPU & Acceleration:** CUDA, cuBLAS, cuDNN (training & inference optimization)
- **Cloud & Platforms:** Google Cloud Platform (GCP), IBM Watson, SPSS
- **Backend , APIs & Tooling:** Flask (REST APIs), WebSocket, API testing & validation (Postman), Streamlit, Taipy Designer, PyQt
- **MLOps & Deployment:** Docker (containerization of ML/LLM services)
- **Operating Systems:** Linux, Windows, macOS

Experience

- **Renault Nissan Technology Business Centre - R&D (NISSAN)** **(Jun 2024 - Present)**
  (AI Research Engineer)
  - Contributed to confidential R&D initiatives focused on Generative AI and applied machine learning systems
  - Evaluated and collaborated with external startups on AI technologies aligned with internal research objectives
  - Integrated GenAI components into internal systems, including LLM-based workflows and retrieval-augmented generation (RAG) pipelines

  - Designed and maintained technical documentation to support research prototypes and internal knowledge transfer
  - Supported project coordination and technical leadership within cross-functional R&D teams
- **DRDO – Centre for Artificial Intelligence and Robotics (July 2023 – Jan 2024)**
  (Project Trainee) Government of India, Bengaluru, Karnataka
  - Worked closely with AI scientists on applied research in computer vision for remote sensing and defence-oriented use cases
  - Designed and implemented an advanced object detection algorithm for SAR satellite imagery, achieving **~15% improvement in detection accuracy** and **~20% reduction in false positives** through model and pipeline optimization
  - Performed large-scale data annotation and labelling to support supervised training and evaluation workflows
  - Developed custom plugins for **QGIS** to support visualization and analysis of geospatial AI outputs
  - Integrated developed algorithms with internal analysis and visualization tools (HITACHI platform) for end-to-end validation
- **Machine Learning Engineer | Technocolabs Software Inc. (May 2022 – Oct 2022)**
  Indore, Madhya Pradesh
  - Collaborated with cross-functional teams to design and deliver an end-to-end ML solution for acquisition likelihood prediction.
  - Built and evaluated supervised ML models achieving **~91.5% accuracy** through feature engineering and model optimization
- **Community Volunteer | Climate Change AI (Jan 2022 – Present)**
  - Contributing to a collaborative research initiative focused on **hurricane prediction using machine learning and AI-based forecasting techniques.**
  - Collaborating with researchers and practitioners to apply AI techniques for climate and social impact use cases.

Patents (Filed)

- **Driver Cognitive Load Based Explainable AI Engine For Vehicle Safety System**
- **Leveraging Satellite Imagery And Machine Learning For Vegetation Management In Power Transmission Lines.**

Awards / Hackathon

- **Amazon ML Challenge (2024)**
  - Ranked 205th out of 5,000+ participants in a competitive machine learning challenge.
  - Built an ML-based solution for extracting structured entity information from images (document & product understanding use cases)
- **NIRAL THIRUVIZHA- HACKATHON (2024)**
  - Awarded ₹10,000 grant for a project on satellite imagery–based vegetation management for power transmission line monitoring.

Specialization / Certification

- **Supervised Machine Learning: Regression and Classification** by DeepLearning.AI and Stanford University, offered through Coursera. Certificate Link
- **Foundation Course on Generative AI – Microsoft** Certificate Link
- **Social Networks – NPTEL Certification** Certificate Link

Projects

- **Object Detection In Sar Satellite Images Using Deep Learning**
  - YOLOv5-based detection system achieving 87% mAP on custom SAR dataset (PyTorch, OpenCV, QGIS)
- **Hurricane Prediction Using AI & ML**

- **ATS Tracking LLM Project with Google Gemini Pro**
  - RAG-based resume analyzer using LangChain and vector embeddings for ATS compatibility scoring
- **Predicting Startup's Acquisition Status**
- **Sound Bite Hearing System for Blind and Deaf People**

Publications

- **Traditional Database vs. Vector Database: Key Differences and Which One to Choose for Your Application (@Medium)**

Languages

- **ENGLISH**
- **MALAYALAM**
- **TAMIL**
- **HINDI**