Akhileshwar Sanathana

AI Engineer | LLMs, RAG Architectures & Computer Vision
London, United Kingdom | akhileshwar008@gmail.com | LinkedIn | Github

Summary

Master's graduate in Artificial Intelligence specializing in Production-Grade RAG Systems, Computer Vision, and Cloud Infrastructure. Proven experience at BGC Partners engineering automated financial workflows and optimizing cloud pipelines. Technical expertise includes building authoritative AI agents with Redis & LangChain, fine-tuning ResNet/ViT architectures for medical imaging, and deploying scalable solutions on Azure & Kubernetes.

Experience

BGC - Cantor Fitzgerald
01/2024 - 07/2024
I.T. Intern
London, UK

- Engineered an automated VM approval workflow using PowerShell and JSON configurations, eliminating a 4-5 hour manual review process and optimizing deployment efficiency by 40%.
- Optimized Python financial data pipelines by implementing a revenue decrement flagging system; this automated alert mechanism reduced the analyst team's incident review time by 30%.
- Managed Azure Cloud infrastructure and Kubernetes clusters, streamlining server-side administration and advancing deployment workflow tools.

Peoplelink Pvt Ltd
06/2022 - 07/2022
Digital Marketing & Data Mining Intern
Hyderabad, India

- Drove a 25% increase in departmental sales by utilizing Excel for B2B market segmentation and data analysis to identify and secure high-potential investors.
- Executed targeted product presentations at client headquarters, resulting in an additional 15% sales growth through direct corporate outreach and client acquisition.

Education

University of Southampton
09/2024 - 09/2025
Artificial Intelligence
Master's Degree

- Dissertation: Developed a deep learning framework combining a 1D-CNN with Conformal Prediction to provide robust heart rate estimates and calibrated uncertainty intervals from wearable PPG sensors, effectively mitigating motion artifacts.

ICFAI University
07/2020 - 07/2024
Computer Science and Engineering
B.Tech
GPA: 7.8/10

Projects

Authoritative RAG with Semantic Caching
Python, Streamlit, Redis, OpenRouter API
https://github.com/Akhil-0412/RAG-Semantic-Cacheing

- Engineered a production-grade Retrieval-Augmented Generation (RAG) system using Redis for vector search and L1/L2 semantic caching, reducing query latency by 98% (from ~2500ms to ~30ms).
- Implemented a strict verification pipeline that validates LLM claims against curated datasets (CDC/SEC), automatically enforcing safety disclaimers for medical and financial queries.

RAG, Redis, Semantic Caching, LLM

Automated Brain Tumor Classification
Python, PyTorch, ResNet-50, Vision Transformers

- Achieved 99% test accuracy in classifying MRI scans by fine-tuning a ResNet-50 architecture with transfer learning.
- Implemented and benchmarked a Vision Transformer (ViT) (patch size 16x16) which reached 98% accuracy, identifying that patch-based attention effectively models global context.

Computer Vision, PyTorch, Healthcare AI

Spider-Inspired Autonomous Robotic Weaver
Raspberry Pi, OpenCV, MQTT, Python

- Built a multi-axis robot capable of autonomously weaving web structures by integrating computer vision (HSV color space) to detect anchor points with 92% accuracy.
- Developed a distributed control architecture where a Raspberry Pi Zero 2W handles vision processing and transmits trajectory data via MQTT/TCP to a Pico 2W motion controller.

Robotics, OpenCV, IoT, MQTT

Music Genre Classification
PyTorch, Librosa, CNNs, GANs

- Architected a CNN with Batch Normalization and RMSProp optimizer that achieved 75.25% accuracy on the GTZAN dataset, outperforming standard Fully Connected baselines by over 20%.
- Explored data augmentation using Generative Adversarial Networks (GANs) to synthesize Mel-spectrograms, improving training stability.

Deep Learning, Audio Processing, GANs

Intelligent Agent for Maritime Cargo
Python, Graph Theory, Vickrey Auctions

- Designed a bidding agent for a reverse Vickrey auction simulation, implementing a 'True Valuation' strategy that secured profitability against competing agents.
- Optimized vessel routing using an exhaustive search algorithm with heuristics, reducing computational complexity to $O(N(g\log(g)+i^2))$ by sorting fleet capabilities.

Algorithms, Game Theory, Optimization

Discovery of Themes via Unsupervised Clustering
Python, NLTK, Scikit-learn, K-Means

- Processed the text8 corpus using NLTK and applied Truncated SVD (LSA) to reduce dimensionality to 1000 features.
- Determined optimal clusters (k=4) using Elbow Method and Calinski-Harabasz scores to extract thematic insights.

NLP, Unsupervised Learning, Data Science

Skills

Languages

Python, SQL, C++, C, JavaScript (React.js)

Machine Learning

PyTorch, TensorFlow, Scikit-Learn, OpenCV, Hugging Face, LLMs

Cloud & DevOps

Azure, AWS, Docker, Kubernetes, Redis, GitHub Actions

Data & Analytics

Pandas, NumPy, Matplotlib, Excel (Advanced), Power BI

Certifications

Google AI Essentials
Google

Scored 90%

GitHub Copilot Certification
GitHub

AWS Certified
Amazon Web Services

Artificial Intelligence Fundamentals
IBM

Publications

Metaverse and Blockchain Use Cases
Taylor and Francis Group
https://doi.org/10.1201/9781003559269

Authored a chapter on digital asset security and decentralized systems (DOI: 10.1201/9781003559269).