

AKASH K VENUGOPALAN

Engineering intelligence for machines that don't forgive errors.

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// Profile Summary

AI and Data Science professional with advanced degrees in Artificial Intelligence (M.Tech) and Electrical & Electronics Engineering (B.Tech). Specializing in computer vision, predictive maintenance, anomaly detection, and time-series analysis for industrial applications. Currently driving global R&D initiatives at Hitachi Energy by architecting end-to-end AI/ML systems for complex mechanical and electrical platforms to optimize enterprise operational performance, reliability, and precision engineering.

// Core Technical Stack

AI & Machine Learning	Artificial Intelligence (AI), Data Science, Large Language Models (LLM), Natural Language Processing (NLP), Computer Vision (CV), Time Series Analysis, Statistical Modelling
Frameworks & Tools	Python, R, TensorFlow, Keras, Scikit-learn, SciPy, Hugging Face, ONNX, Flask App, Streamlit
Cloud & MLOps Dev	Data Analysis, Data Visualization (Matplotlib, Seaborn), Azure, CI/CD and Automation, Spark, Databricks
Languages	English, Hindi, Malayalam, Tamil

// Professional Deployments

R&D Engineer – Artificial Intelligence and Automation

Dec 2024 – Present

Hitachi Energy | Supporting Sweden R&D

- **Feasibility & Concept Engineering:** Spearheading deep technical studies and developing computer vision / AI frameworks from scoping through to validation and live PoC delivery.
- **Industry 4.0 Integration:** Accelerating modern manufacturing environments by integrating robust deep learning pipelines directly into Power Transformer production flows.
- **Algorithmic Optimization:** Overseeing software prototyping and high-throughput optimization of AI algorithms to guarantee deterministic runtime reliability in heavy machinery environments.
- **MLOps Architecture:** Crafting secure automated CI/CD configurations to enable fluid containerized AI deployments and microservice clustering.
- **Global Research Synergy:** Actively partnering with worldwide R&D hubs, premier universities, and external ventures to map incoming disruptive tech spaces.

Artificial Intelligence Research Engineer

July 2022 – Nov 2024

Toshiba R&D | Bengaluru, India

- **Industrial Deep Learning:** Formulated cutting-edge neural models inside the central R&D corporate group to intercept complex production automation challenges.
- **Computer Vision Excellence:** Designed and deployed custom Siamese Network structures within processing lines to optimize structural anomaly tracking out of live high-speed stream inputs.
- **Time-Series Forecasting:** Engineered predictive safety systems utilizing mathematical sequence frameworks (ARIMAX, VARMA, FB-Prophet) to forecast operational failures across Hot Strip Mills (HSM).
- **Explainable AI (XAI):** Integrated diagnostic explanation models to identify true root causes of failure paths over process signal timelines generated at Steel Rolling Mills.
- **Hybrid Modeling:** Crafted bespoke sequential anomaly detectors leveraging combined layers of CNN, LSTM, GRU, and Attention structures.
- **Applied LLM Scoping:** Conducted fine-tuning and structural prompt validation on Hugging Face T5 models to auto-generate context comments from deep application codebases.

Artificial Intelligence Research Intern

Sep 2021 – June 2022

Toshiba R&D | Bengaluru, India

- **Diagnostic Pipelines:** Conducted exploratory engineering tracks focusing on unsupervised anomaly detection architectures for massive stream streams.
- **Unsupervised Models:** Deployed deep CNN-LSTM Autoencoders layered with algorithmic clustering models (DBSCAN, K-Means) to monitor equipment stress signatures.

// Shipped Systems & Products

Power Transformer Vision System

Dec 2024 – Present

Architected custom deep segmentation models geared specifically toward real-time quality verification, dimensional alignment checking, and instant flaw detection on active transformer asset panels.

Equipment Quality Diagnosis System (EQDS) – Analytics Dashboard

July 2023 – Dec 2023

Created an interactive diagnostics dashboard application using Streamlit to present live predictive outcomes, interactive parameter tuning options, and threshold anomalies produced by underlying FB-Prophet models.

// Academic Profile

Master of Technology (M.Tech) in Artificial Intelligence

2020 – 2022

Amrita Vishwa Vidyapeetham | Kerala, India

Bachelor of Technology (B.Tech) in Electrical & Electronics Engineering

2016 – 2020

Saintgits College of Engineering | Kerala, India

// Publications

1. Keypoint-Based Detection and Region Growing-Based Localization of Copy-Move Forgery in Digital Images

Published in *Springer Conference (CVMI)*, 2023. (Derived from M.Tech Dissertation).

2. Copy-move forgery detection - A Survey

Published in *IEEE International Conference (ICICICT)*, 2022.

3. Study of Quantum Annealing and the type of related applications

Published in *IEEE Conference (PuneCon)*, 2022.

4. AI Based Audio Recognition System For Visually And Audibly Challenged

Published in *IEEE International Conference (ICOSEC)*, 2020. (Derived from B.Tech Capstone Project).

// Certifications

International Academic Qualifications Verification – Evaluated and issued by World Education Services (WES), Canada (Credential Issued: May 2023).