SAM ROBIN SINGH E

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SUMMARY

AI & Machine Learning Engineer with strong expertise in Deep Learning, Computer Vision, NLP, and Data Analytics, skilled in building end-to-end AI solutions from data preprocessing and model training to deployment and monitoring. Experienced in developing scalable enterprise applications using Java, Groovy, FastAPI, and integrating LLMs/SLMs with Retrieval-Augmented Generation (RAG) for intelligent automation. Proven ability in deploying optimized models on edge devices (Jetson Nano, Raspberry Pi) using TensorFlow Lite, OpenCV, and OCR, and building real-time dashboards using Grafana, Power BI, and SQL. Passionate about delivering high-impact AI-driven products that improve decision-making, automation, and user experience.

EDUCATION

Francis Xavier Engineering College, Tirunelveli **Nov 2022 - May 2026**

- B.Tech in Artificial Intelligence and Data Science (with Minor in Business Analytics)

SKILL AND TOOLS

- **Programming Languages & Tools**: Python, R, Julia, SQL, C, Git, Flask, FastAPI, Java, HTML, CSS, Groovy.
- **Machine Learning & AI:** Scikit-learn, TensorFlow, PyTorch, OpenCV, Hugging Face Transformers, NLTK, SpaCy, Deep Learning, Computer Vision, Natural Language Processing, Time Series Analysis, Predictive Modeling.
- **Data & Big Data:** Pandas, NumPy, SQL, Apache Spark, Apache Kafka, PostgreSQL, MongoDB.
- **Cloud, Deployment, MLOps & Automation:** AWS, Google Cloud Platform (GCP), Docker,MLflow, DVC, CI/CD (GitHub), Model Monitoring.
- **Data Analysis & Visualization:** Exploratory Data Analysis, Google Analytics, Microsoft Power BI, Google Data Studio, Grafana, Tableau.

WORK EXPERIENCE

- **Pangun Technologies – Programming Intern (Remote)** **June 2025 – Present**
  - Architected modular frontend and backend components for a web-based Enterprise Resource Planning (ERP) application.
  - Engineered core business logic utilizing Java and Groovy, while designing dynamic user interfaces with Freemarker templates.
  - Implemented scalable ERP architecture following enterprise-grade modular practices to ensure system maintainability.
  - Integrated Large Language Models (LLMs) and Small Language Models (SLMs) with query storage to automate intelligent workflows.
  - Developed specialized AI-driven modules for LCM, FEMA, and RAMS by leveraging Retrieval-Augmented Generation (RAG) for context-aware accuracy. Enhanced decision-support systems by deploying recommendation-based features that improved overall user experience and efficiency
- **Edge Matrix Corporation – Artificial Intelligence Intern (Hybrid)** **Jan 2024 – Mar 2024**
  - Developed real-time object detection solutions using TensorFlow for edge AI applications.
  - Integrated mobile camera streams via OpenCV for efficient object recognition.
  - Deployed deep learning models on Raspberry Pi and Jetson Nano, optimizing for low-latency inference.
  - Leveraged TensorFlow Lite, OpenCV, and OCR for real-time object detection, text recognition, and video streaming solutions. Created streaming solutions using Flask and Socket for seamless live data transmission.
- **Quantanics TechServ Pvt Ltd – Artificial Intelligence and IoT Intern (Hybrid)** **Nov 2023 – Mar 2024**
  - Developed IoT data visualization dashboards using Grafana with MQTT protocol for real-time device monitoring.
  - Integrated real-time SQL databases for efficient storage and retrieval of IoT sensor data.
  - Simulated Denial-of-Service (DoS) attacks using sample bots to assess and improve system resilience.

PROJECTS

- **Railway Grievance Management System |** Python, Javascript, HTML, CSS, Grafana and Gemini AI LINK
  - Built an AI-powered grievance classification platform to automatically categorize railway complaints in real time.
  - Integrated a Gemini AI chatbot for instant user support and automated feedback handling.
  - Developed backend APIs using FastAPI and implemented interactive dashboards using Power BI and Grafana for complaint trend monitoring and analytics.
- **Speech Synthesis AI Framework |** Whisper (OpenAI), LLaMA 3.2, Kokoro TTS, Python LINK
  - Designed a real-time conversational AI framework enabling voice-based interaction and response generation.
  - Implemented Speech-to-Text using Whisper, context-aware text generation using LLaMA 3.2, and speech synthesis using Kokoro TTS.
  - Developed an end-to-end speech-in to speech-out pipeline for virtual assistants, accessibility tools, and customer support automation.

- **FinCortex |** Python, XGBoost, Scikit-learn, Pandas, NumPy LINK
  - Developed an XGBoost fraud detection model using a 6.3M-transaction Kaggle dataset to identify TRANSFER and CASH_OUT fraud patterns.
  - Performed comprehensive feature engineering and handled class imbalance using scale_pos_weight to optimize prediction accuracy.
  - Achieved 96% precision, 80% recall, and an 87% F1-score, significantly reducing false fraud alerts and improving detection reliability
- **AgriSense |** Python, TensorFlow, PyTorch, Keras, NumPy, Pandas LINK
  - Built a CNN-based plant disease classification system to detect leaf diseases and recommend solutions.
  - Trained a custom PyTorch CNN model and deployed prediction workflow using TensorFlow/Keras.
  - Implemented preprocessing pipelines with NumPy and Pandas for efficient dataset handling and real-time inference.

PATENT

- **AI Driven Autonomous Wheelchair**
  - Inventors: Sam Robin Singh E, Dr. A. Anitha, Mari Selvam K, Sai Maharajan G, Kathirkamavel S
  - Application No.: 202541066899 A | Filed: 14/07/2025 | Published: 25/07/2025
  - Published in The Patent Office Journal, Issue No. 30/2025, Government of India.
  - Proposed an AI-enabled autonomous wheelchair system using machine learning, sensor fusion, and computer vision for intelligent navigation, obstacle avoidance, and real-time decision-making.

PUBLICATIONS

- **Financial Forecasting using Time Series Analysis, ARIMA and GARCH**
  - 12/2024 - MI-IRICT 2024 | e-ISSN: 2811-3888
  - Explores the application of ARIMA, GARCH, and machine learning techniques for financial time series forecasting, focusing on market pattern detection, price prediction, and volatility estimation to support informed investment decisions.
- **XR Education**
  - 08/2024 -TIJER – International Research Journal | Published in Volume 11, Issue 8 | Impact Factor: 8.57 (Google Scholar) Reg. ID: 107322

  Paper ID: TIJER2408038 | ISSN: 2349-9249 ,this paper explores advancements in Extended Reality (XR) for education, highlighting immersive learning environments and their role in enhancing engagement and knowledge retention.

AWARDS

- DataVista YUKTI '25 - Third Position | Issued by Thiagarajar School of Management - Quantrix Club . **Feb 2025**
- Best Research Paper Award - MI-IRICT 2024 | Issued by MAHSA University, Malaysia . **Nov 2024**
- HONORABLE MENTION – IEEE International Innovation Challenge (Grand Finale) | Issued by IEEE - YESIST'12 ,Tunis Science City, Tunisia . **Sep 2024**
- 30-Hours Hackathon - First Position | Issued by Hack The Mountain 5.0 . **Sep 2024**
- AI/ML Project Presentation - III Prize | Issued by APOGEE 2024 - BITS Pilani . **Apr 2024**
- Project Presentation - First Position | Issued by SKIT - YESIST'12 . **Mar 2024**

VOLUNTEERING

- **Curriculum Writing ,Team Everest NGO** **Jul 2023 - Aug 2023**
  - Developed engaging educational games and learning activities for rural children.
  - Contributed to curriculum design and creative content development to improve learning outcomes.
- **Student Ambassador – SkillForge** **Jul 2024 – Sep 2024**
  - Represented SkillForge at Francis Xavier Engineering College for campus outreach and brand promotion.
  - Coordinated student engagement activities and events to increase visibility and participation.
  - Enhanced leadership, communication, and teamwork through active collaboration.

ACHIEVEMENTS

- Solved 750+ problems on a variety of platforms, including Codechef, HackerRank and Leetcode .

CERTIFICATIONS & LICENSES

- Linear Algebra for Machine Learning & Data Science – DeepLearning.AI (Coursera)
- Supervised Machine Learning: Classification – IBM (Coursera)
- Supervised Machine Learning: Regression (with Honors) – IBM (Coursera)
- Exploratory Data Analysis for Machine Learning (with Honors) – IBM (Coursera)
- Unsupervised Learning & Its Applications in Marketing – O.P. Jindal Global University (Coursera)
- Tech Recruitment Certified Professional – DevSkiller
- Google Analytics for Beginners – Google
- Introduction to Data Studio – Google
- Deep Learning Workshop – SIAS Research Forum