Sakhinala Sanjay Bhargav

AI/ML Engineer

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sanjay-sakhinala | DNSdecoded | Portfolio

Summary

AI/ML Engineer transforming research into production-ready solutions. Delivered **65% cost reduction** in EM simulation through reinforcement learning innovation. Built and deployed multilingual NLP systems, computer vision pipelines, and secure communication platforms. Published research combining deep learning expertise with practical MLOps skills to create scalable, high-impact AI applications.

Skills

AI & Machine Learning	Deep Learning, Computer Vision, Reinforcement Learning (SAC, PPO), Transformers, Retrieval-Augmented Generation (RAG), Multilingual NLP, Prompt Engineering
ML Frameworks	PyTorch, TensorFlow, Scikit-Learn, Stable-Baselines3, HuggingFace Transformers, TorchVision, OpenCV
MLOps & Deployment	Docker, FastAPI, Model Serving & CI/CD Pipelines, Vertex AI, REST APIs, On-Prem Deployment, GPU Optimization
Data Engineering & Analytics	Pandas, NumPy, SQL, BigQuery, Data Wrangling, Feature Engineering, Visualization (Matplotlib, Seaborn, Tableau, Power BI)
Security & Systems	Python, Linux (CLI), Cryptography (RSA, AES), Networking (TCP/IP, DNS), Shell Scripting

Key Projects

Uncertainty-Aware RL System for EM Structure Optimization Private Repository

Architected reinforcement learning framework automating antenna geometry design, **reducing CST simulation calls by 65%**. Implemented uncertainty-aware Soft Actor-Critic agent with LightGBM + MLP surrogate models, custom Gymnasium environment, and fabrication-feasible reward shaping. Achieved convergence in 40% fewer episodes through hybrid surrogate approach with iterative CST validation pipeline.

Tech: PyTorch, CUDA, Stable-Baselines3, LightGBM, Optuna, CST API

IndicRAG — Multilingual Indic Document QA System GitHub: IndicRAG

Built production-ready RAG pipeline supporting **12+ Indian languages** with multilingual dense embeddings and cross-encoder reranking. Integrated OCR for scanned PDFs (Tesseract + LayoutParser), semantic chunking for long documents, and deployed FastAPI service. Achieved accurate contextual answers using mT5/mBERT models with FAISS vector retrieval.

Tech: HuggingFace Transformers, FAISS, PyTesseract, FastAPI, RAG Architecture

CipherChat — Secure End-to-End Encrypted Messenger GitHub: CipherChat

Engineered CLI-based encrypted messaging system using **AES-256 + RSA-2048 hybrid cryptography**. Implemented secure key exchange protocol, encrypted TCP sockets with SHA-256 integrity verification, and multi-user real-time messaging. Ensured zero-knowledge architecture with identity authentication and forward secrecy.

Tech: Python, Socket Programming, Cryptography, TCP/IP, Multi-threading

EuroSAT Land Use Classification GitHub: landuse-cnn-eurosat

Developed CNN achieving **89% test accuracy** across 10 land-use classes on satellite imagery. Integrated Grad-CAM explainability for feature attribution and model interpretability.
Tech: PyTorch, TorchVision, OpenCV, Grad-CAM

DNS Resolver Performance Benchmark GitHub: dns_analyzer

Built multithreaded DNS benchmarking tool measuring latency across **15+ global providers**. Automated CSV analytics and visualization for resolver performance comparison and optimization insights.
Tech: Python, dnspython, Pandas, Matplotlib, Concurrent Processing

Industry Experience & Applied Training

AI/ML Internship — Google (via EduSkills) Jan 2025 – Mar 2025

- Developed computer vision modules using Python and OpenCV to automate image detection tasks for mobile applications.
- Evaluated model performance and deployed ML pipelines using Google's Vertex AI and Model Deployment APIs.
- Integrated ML features into end-to-end app workflows, enabling real-time inference and improved automation efficiency.

Cybersecurity Internship — Palo Alto Networks (via EduSkills) Oct 2024 – Dec 2024

- Implemented firewall policy optimization to strengthen network access control and reduce alert false positives.
- Analyzed threat logs and worked with SIEM workflows to identify anomalies using intelligent log-correlation systems.
- Gained working knowledge of secure network design, intrusion detection fundamentals, and endpoint protection frameworks.

Data Science Applied Training — Altair (via EduSkills) Apr 2024 – Jun 2024

- Built no-code ML pipelines in RapidMiner for data preprocessing, feature engineering, and model evaluation.
- Applied supervised learning algorithms like SVM and Random Forest to tackle classification tasks and performance benchmarking.
- Performed exploratory data analysis (EDA) and interpreted results to derive actionable data insights.

Education

- **B.Tech in Electronics and Communication Engineering** **May 2025**
  Bapatla Engineering College, Bapatla, Andhra Pradesh
- **Diploma in Electronics and Communication Engineering** **Oct 2021**
  Aditya College of Engineering, Surampalem, Andhra Pradesh
- **Secondary School Certificate (SSC)** **Apr 2018**
  Ravindra Bharathi High School, Pithapuram, Andhra Pradesh

Certifications

Google Data Analytics Professional Certificate — Completed Mar 2025
Skills: SQL, R Programming, Data Cleaning, Data Visualization (Tableau), Business Communication, Spreadsheet Analytics

Google Cybersecurity Professional Certificate — Completed May 2024
Skills: Network Security, Python for Security, Linux Essentials, Cloud Security, Network Architecture

Google Prompting Essentials — Completed May 2025
Prompt engineering for GenAI workflows

AI For Everyone — DeepLearning.AI — Completed Feb 2025
AI strategy, ML fundamentals, business use-cases

Google Skill Badges (10+ Hands-on Badges)
TensorFlow, Image Classification, Product Search, Object Detection, ML Learning Paths, Cloud Innovator Program, Google I/O Participation

NPTEL Certifications
Cloud Computing — Engineering architecture and virtualization concepts
Computer Networks & Internet Protocols — TCP/IP, routing, DNS, network performance

Patents

Design of Hexagonal Patch Antenna at 28 GHz
Inventor: Sakhinala Sanjay Bhargav
Application No.: 202541014595 A — Published: Mar 7, 2025 (India)

Publications

- **Bandwidth Enhancement of Slotted Hexagonal Patch Antenna for 6G Ultra-Fast Data Transfer and Brain-Computer Interface**
  Presented at ICMOCE 2025, IIT Bhubaneswar
  DOI: 10.1109/ICMOCE64100.2025.11076991 — Publication Date: July 17, 2025

- **Bandwidth Optimization of Slotted Circular Patch Antenna for 6G Ultra-Fast Data Transfer and Brain-Computer Interface Application**
  Presented at 16th ICCCNT 2025, IIT Indore
  Proceedings submitted to IEEE Xplore — Publication Pending

- **Uncertainty-Aware Reinforcement Learning System with Blended Surrogate Models for Electromagnetic Structure Optimization**
  Status: Under Review