PRAJWAL KUMAR

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EDUCATION

Carnegie Mellon University M.S. in Artificial Intelligence Engineering – Information Security GPA: 3.6 / 4.0 — Dec 2025

Maharshi Dayanand University Bachelor of Technology in Computer Science & Engineering GPA: 8.27 / 10 — Jun 2024

MACHINE LEARNING & AI EXPERIENCE

- Built a multimodal AI agent using CNN (speech), BERT (text), and LLMs; achieved 0.73 confidence, 0.8 semantic coherence.
- Developed a LangChain + RAG supplement advisor with Fast API and AWS; integrated explainable ML for transparency.
- Created a multilingual RAG assistant using Mistral AI + ChromaDB; supported 5 languages with cosine-based search.
- Built a malware classifier (ResNeXt CNN + XGBoost + GPT); achieved 99.68% accuracy with GUI and LLM explanations.
- Implemented a decoder-only Transformer (GPT) from scratch in PyTorch, engineering key components including causal multi-head self-attention and advanced Rotary Positional Embeddings (RoPE).
- Built a SparkML pipeline on FIFA data (18K+ rows, 100+ features) for rating prediction and clustering; containerized with Docker.

WORK EXPERIENCE

AI/ML Summer Intern | Infinite Computer Solutions **May 2025 – Present | Irving, Texas**

- Engineered an agentic AI system using LangChain and Playwright to fully automate the customer phone purchase workflow on telecom websites, enabling robust, end-to-end anomaly detection.
- Deployed LLM-powered agents to autonomously navigate complex user flows, including product selection, form completion, and checkout, reducing the need for manual testing by over 90%.
- Modeled user interaction data collected by the agentic system into a knowledge graph using Neo4j, providing a structured framework for analyzing customer journey patterns and identifying friction points.

Machine Learning Developer Intern | Qriocity **Jan 2024 – Feb 2024 | Chennai, India**

- Engineered medicine prescription ontology using TensorFlow and RDFLib with graph-based knowledge representation.
- Developed an email phishing detection model using an ensemble of Logistic Regression classifiers and TF-IDF vectorization, achieving 96% accuracy with a focus on minimizing false negatives to enhance security.
- Architected a Speech-to-Text interview analysis system using NLP to predict recruitment likelihood, streamlining the initial screening process and deploying the tool on Streamlit for interactive use by the hiring team.

Machine Learning Intern | ScriptEdge Pvt. Ltd. **Jul 2022 – Aug 2023 | Akola, India**

- Built a Bidirectional LSTM model for language identification on 1,000+ sentences (10 languages), achieving 98% accuracy.
- Built RASA conversational AI with 30+ intents, custom NER pipeline, and database integration for enterprise deployment.
- Developed a multimodal, speech-to-image generative system by integrating OpenAI's Whisper with a ControlNet-guided Stable Diffusion model, enabling the creation of complex visuals directly from voice commands.
- Engineered a privacy-preserving synthetic data pipeline using a PATE-GAN to generate high-fidelity fingerprint images, enabling robust training of biometric authentication systems while eliminating the need to use sensitive, real-world user data.

ACADEMIC RESEARCH & PROJECTS

Malware Classification using Multi-Modal Approaches – Carnegie Mellon University (GitHub)

- Designed a multi-modal malware detection pipeline using CNN (ResNeXt), XGBoost (n-grams), and LLaMA-based LLMs, achieving 99.68% image classification accuracy and building a real-time GUI with JSON-based LLM explainability.

Emotion-Aware Multimodal AI Companion - Carnegie Mellon University (GitHub)

- Built a multimodal AI companion with speech-to-text (Google API), CNN-based SER (71.2%), and Transformer models; improved LLM empathy by 30% via psychoanalysis modules and deployed a Streamlit app for real-time emotion feedback.

End-to-End Movie Recommender with Kafka, Kubernetes, and A/B Testing - Carnegie Mellon University (GitHub)

- Built a scalable KNN-based movie recommender (NDCG@10 = 0.9983, 65K+ QPS) with Dockerized microservices, Kubernetes, CI/CD (Jenkins), and CRON-based retraining; integrated A/B testing and real-time monitoring with Prometheus + Grafana.

Advancing Image Security through Deep Learning and Cryptography in Healthcare and Industry - IEEE (Paper)

- Authored an IEEE conference paper on a novel deep learning-based cryptographic framework using chaotic systems and weight analysis to generate robust, undetectable encryption patterns for securing medical images in IoMT environments.

SKILLS

Languages & Libraries: Python, SQL, Pandas, NumPy, Scikit-learn, TensorFlow, PyTorch, Keras, OpenCV, NLTK, PySpark
ML & GenAI Tools: Hugging Face Transformers, LangChain, Mistral AI, ChromaDB, MLflow, Prompt Engineering, Vector Databases
Cloud & MLOps: AWS, Google Cloud (Vertex AI, Gemini, BigQuery), Docker, Kubernetes, Jenkins, Prometheus, Grafana, CI/CD
Infrastructure & Databases: Git, Linux, Flask, PostgreSQL, Neo4j, Kafka, Knowledge-graph, RAG Pipelines