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 FastAPI 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.
- Published an IEEE paper on deep learning–based encryption for securing medical images and EHRs in IoMT systems.
- Built Transformer from scratch using PyTorch for character-level text generation with attention, masking, and embeddings.
- Built a SparkML pipeline on FIFA data (18K+ rows, 100+ features) for rating prediction and clustering; containerized with Docker.
- Integrated Whisper, Stable Diffusion, and ControlNet to generate real-time speech-to-image outputs using GANs and Streamlit.

WORK EXPERIENCE

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

- Engineered medicine prescription ontology using TensorFlow and RDFLib with graph-based knowledge representation.
- Implemented email phishing detection model using ensemble of Logistic Regression classifiers with TF-IDF vectorization for feature extraction, achieving 96% accuracy with focus on minimizing false negatives.
- Created Speech-to-Text interview system with SpeechRecognition and natural language processing pipeline, incorporating probabilistic model for recruitment likelihood prediction with Streamlit deployment.
- Designed emotion detection system using transfer learning in TensorFlow with K-NN for psychological indicators.

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

- Implemented generative multimodal system using Stable Diffusion with ControlNet for conditional image generation, integrating OpenAI Whisper for speech-to-text and custom prompt engineering for domain-specific outputs.
- Engineered multilingual text classification system using bidirectional LSTM networks with attention mechanisms.
- Built RASA conversational AI with 30+ intents, custom NER pipeline, and database integration for enterprise deployment.
- Designed computer vision system for QR code artistic integration using conditional GAN architecture with ControlNet, implementing perceptual loss functions to maintain QR functionality while maximizing aesthetic quality.

Data Science Intern, Zummit Infolabs **Nov 2022 – Mar 2023** | **Bengaluru, India**

- Led development of driver drowsiness detection using CNN-LSTM with Keras and OpenCV (94% accuracy, 2800 images).
- Designed Squeeze-Excitation Network for image quality classification with channel attention mechanisms (92% accuracy).
- Developed toxic content classifier using PyTorch with BERT embeddings and adversarial training (96% accuracy).
- Engineered NLP chatbot with hierarchical attention networks, contextual memory, and entity recognition.

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.

Emation-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.

Multilingual RAG Pipeline for Research Paper Recommendation using Mistral AI - Carnegie Mellon University (Github)

- Developed a multilingual RAG pipeline with ChromaDB for semantic search across research papers. Integrated Mistral LLM with LangChain, compared embedding models and deployed a Streamlit application for paper recommendations.

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