

PRAJWAL KUMAR

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SUMMARY

CMU MS in AI Engineering specializing in AI Agent development, Deep Learning, Generative AI, and scalable RAG pipelines. Published researcher experienced in fine-tuning LLMs and engineering robust, cloud-native solutions using PyTorch and AWS.

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

- Engineered end-to-end Machine Learning pipelines, secure OCR-powered Flask API on Microsoft Azure Computer Vision, processing real-time data streams with Kafka, evaluating models and synthetic data generation with PyTorch, Zeno, and LLMs.
- Trained a high-F1 PyTorch intrusion detection model on GCP Vertex AI Workbench, using PySpark for data engineering. Mitigated class imbalance with a weighted loss MLP and accelerated training with GPU (MPS) and Distributed Data Parallel (DDP).
- Implemented character-level GPT in PyTorch with RoPE; built tokenizer, training loop, and evaluation from scratch. Boosted sequence generation accuracy from <10% to >30% vs. vanilla Transformer using full pretraining + finetuning.
- Designed an end-to-end data system on GCP to predict player value; built PySpark ETL pipeline from GCS to Cloud SQL (PostgreSQL) and trained regression models (SparkML, PyTorch) using Optuna/CrossValidator, deployed via Cloud Run.

WORK EXPERIENCE

AI/ML Summer Intern | Infinite Computer Solutions

May 2025 – Aug 2025 | Irving, Texas

- Built an Agentic AI system with LangChain, crawl4ai, and Playwright to automate workflows and a Neo4j graph from logs, enabling anomaly detection, cutting testing by 90%, and enhancing Verizon's customer journey UX and conversions.
- Developed a Agentic AI RAG system with Neo4j, LangChain, and OpenAI for semantic search on customer journeys logs data on telecom websites, optimized PyTorch embeddings, and cut latency by 30% via Streamlit-based interface.

Machine Learning Developer Intern | Qriocity

Jan 2024 – Feb 2024 | Chennai, India

- Engineered a deep learning-driven ontology for precise medicine prescription, leveraging TensorFlow and rdflib. Integrated structured medical data to train a neural network, achieving 99% accuracy in predicting optimal medications for diseases.
- Engineered a multi-modal mental health chatbot (text/speech) with a hybrid TensorFlow DNN and KNN model. Predicted emotional VAD scores from TF-IDF vectors, then classified into discrete emotions to provide empathetic user support.

Data Science Intern | Zummit Infolabs

Nov 2022 – Mar 2023 | Bengaluru, India

- Trained a CNN model to classify the images into Sharp, Blurred, and Overexposed subcategories using Squeeze and Excitation Networks (SE Block). The dataset comprises 10GB of Sharp images, converted into Blurred and Overexposed counterparts.
- Trained an ML model using PyTorch which identifies and classifies toxic comments from celebs' social media accounts, getting an accuracy of 96%.

ACADEMIC RESEARCH & PROJECTS

Neural Robot Dynamics: Linear-Time Inference and Long-Horizon Stability via Selective State Space Models ([Report](#))

- Replaced Transformer dynamics with Mamba (SSM) and Jamba hybrid (SSM + attention) to enable linear-time inference and state-of-the-art sim-to-sim fidelity, limiting RL policy degradation to 1.37% over long-horizon rollouts.

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

- Built a multimodal AI companion with speech-to-text (Google API), BERT (text), CNN-based SER (71.2%), and Transformers; 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, PyTorch, TensorFlow, Apache Spark (PySpark), Streamlit

ML & GenAI Tools: Hugging Face Transformers, LangChain, Mistral AI, OpenAI, MLflow, Vector Databases, Playwright, Crawl4ai

Cloud & MLOps: AWS, GCP (Vertex AI, Gemini, BigQuery), Docker, Kubernetes, Jenkins, Prometheus, Grafana, CI/CD, REST

Infrastructure & Databases: Git, Linux, Flask, PostgreSQL, Neo4j, Kafka, Postman