Anuj Patel

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EDUCATION

New York University **Sep 2023 – May 2025**
Master of Science in Electrical Engineering (GPA: 3.9/4.0) New York, NY

- Coursework: ML, DL, High Performance Machine Learning, Probability & Stochastic Processes, CV, Big Data
- Graduate Teaching Assistant: Fundamentals of Communication Theory

Vellore Institute of Technology **Jul 2019 – May 2023**
Bachelor of Technology in Electronics and Communication Engineering (GPA: 9.16/10) Vellore, India

WORK EXPERIENCE

Data Science Intern **Jun 2024 – Aug 2024**
Johnson & Johnson New Brunswick, NJ

- Built and deployed **Random Forest** and **XGBoost** models on **AWS SageMaker** (achieving an R^2 **of 0.92** and **17% lift**), while engineering an **MLOps pipeline** with **Kubernetes, Docker**, and **CI/CD automation**.
- Enhanced model accuracy by **40%** on a multimodal surgical dataset via strategic **hyperparameter tuning** and **ensemble learning**.

Machine Learning Researcher – Quantum Communications **Dec 2022 – May 2023**
Indian Space Research Organization (SAC) Ahmedabad, India

- Engineered ML models in Python and C++ to optimize polarization characterization for a QKD testbed, **cutting manual intervention by 85%**.
- Deployed signal processing algorithms for a free-space BB84 QKD system via NI USRP, **achieving a BER of 10E-10** and **0.8 correlation**.

Network Intern **May 2022 – Jul 2022**
Indian Oil Corporation Ltd. Vadodara, India

- **Reduced routing speeds by 20%** for MPLS and SD-WAN networks by identifying bottlenecks, conducting A/B testing, and exploring alternate paths.

SKILLS

Programming	Python, R, SQL, Pandas, NumPy, MATLAB, C/C++, CUDA, Java, Bash, Verilog, VHDL
AI/ML	TensorFlow, PyTorch, Scikit-Learn, NLP, LLM (Hugging Face, LangChain, Transformers)
Data Analytics	Tableau, PowerBI, D3.js, matplotlib, seaborn, plotly, ggplot, Hadoop, PySpark, Hive
Cloud	AWS (Sagemaker, EC2, ELB, S3, Redshift), GCP (Vertex AI, BigQuery, AutoML)
DevOps	Kubeflow, Airflow, Kafka, Spark, Git, CI/CD, Kubernetes, Docker, ETL
Databases	PostgreSQL, CosmosDB, MongoDB, ChromaDB

PROJECTS

Efficient Federated Learning using Gradient Pruning and Adaptive Methods | *PyTorch* **Sep 2024 - Dec 2024**

- Pioneered an efficient FL framework with gradient pruning and adaptive federated optimization, **reducing training time by 22%** and boosting model generalization.
- Increased **bandwidth efficiency by 143%** via gradient compression and mix-precision training, validating ResNet accuracy with PyTorch DDP and DeepSpeed and Hugging Face Accelerate.

Medical Chatbot with RAG Architecture | *Llama-3, Hugging Face, LangChain, HPC* **Sep 2024 - Dec 2024**

- **Developed a RAG pipeline** integrating finetuned LLMs (Llama-3, Llama-2, Gemma 1.1, Mistral-7B, DistilGPT2) with LangChain and leveraging **Weaviate** to index/retrieve data from PubMedQA.
- Achieved a **precision of 88.3%** and **BERT score of 0.87**, with memory efficiency at **4.1GB** for low-cost compute.

Movie Recommendation System with NCF | *Python, PyTorch, PySpark, SQL* **Sep 2024 - Dec 2024**

- Built a scalable movie recommender using NCF, **achieving 50% Hit Ratio** on MovieLens 1M with distributed Spark processing and SQL data warehousing.
- Optimized a 1M-record pipeline with preprocessing, negative sampling, SQL backend, and a Streamlit frontend, **reducing retrieval time by 33%**.