Viraj Hemangkumar Pathak

AI/ML Engineer

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Professional Summary

AI/ML Engineer with 3 years of experience designing, developing, and deploying large-scale machine learning solutions for healthcare and insurance domains. Strong expertise in building end-to-end ML pipelines using Python, TensorFlow, PyTorch, and scikit-learn, with deep hands-on experience in data engineering, feature engineering, model optimization, and production deployment on cloud platforms. Proven ability to deliver measurable business outcomes by improving prediction accuracy, automating decision workflows, reducing operational costs, and enabling real-time insights. Experienced in MLOps, cloud-native architectures, CI/CD automation, and cross-functional collaboration in Agile environments.

Professional Experience

AI/ML Engineer | Humana | USA **July 2025 – Present**

- Designed and deployed end-to-end machine learning solutions for healthcare analytics using Python, TensorFlow, and scikit-learn, supporting risk stratification, member churn prediction, and care gap identification, which improved predictive accuracy by 29% and enabled proactive care interventions for over 2.5 million members.
- Built scalable data ingestion and preprocessing pipelines using PySpark, SQL, and AWS Glue to process structured and unstructured healthcare datasets including claims, EHR, and eligibility data, reducing data processing time by 41% while improving data quality and feature consistency across models.
- Developed advanced feature engineering frameworks leveraging domain-specific healthcare indicators, temporal aggregation, and behavioral signals, resulting in a 22% improvement in model recall for high-risk patient identification and reduced false positives in downstream workflows.
- Implemented and optimized supervised and ensemble models including XGBoost, Random Forest, and Gradient Boosting for cost prediction and utilization forecasting, directly contributing to an estimated $6.8M annual cost savings through improved resource allocation.
- Designed and deployed deep learning models using TensorFlow and PyTorch for NLP-based clinical text analysis, enabling automated extraction of insights from physician notes and medical documentation with a 34% increase in text classification precision.
- Operationalized machine learning models using AWS SageMaker, Docker, and REST APIs, enabling real-time inference and batch scoring pipelines with 99.7% production uptime and automated retraining schedules.
- Established robust MLOps practices using MLflow and CI/CD pipelines to manage model versioning, experiment tracking, and deployment automation, reducing model release cycles by 38% and improving reproducibility across teams.
- Built real-time monitoring and model performance dashboards using Power BI and Python, tracking drift, accuracy, latency, and data anomalies, which reduced post-deployment incidents by 46%.
- Collaborated closely with data engineers, clinicians, product managers, and compliance teams in Agile Scrum environments to translate business requirements into scalable ML solutions while ensuring HIPAA compliance and data governance standards.

Machine Learning Engineer | CitiusTech | India **July 2021 – Nov 2023**

- Developed and deployed machine learning models using Python, scikit-learn, and Spark MLlib to support healthcare analytics use cases such as patient outcome prediction, readmission risk scoring, and provider performance analysis, improving overall model accuracy by 26%.
- Built large-scale ETL and data transformation pipelines using PySpark, SQL, and Hadoop to process multi-terabyte healthcare datasets, enabling faster model training cycles and reducing data latency by 35%.
- Implemented feature selection, dimensionality reduction, and statistical validation techniques to enhance model robustness, resulting in a 21% reduction in overfitting and improved generalization across diverse patient populations.
- Designed NLP pipelines using spaCy, NLTK, and transformer-based architectures to extract insights from clinical narratives, claims notes, and unstructured medical text, increasing automated insight extraction efficiency by 31%.
- Deployed ML models into cloud environments using Docker and Kubernetes, supporting scalable inference workloads and reducing infrastructure costs by 24% through optimized resource utilization.
- Created automated model evaluation frameworks to track precision, recall, ROC-AUC, and F1 scores across production datasets, improving model transparency and accelerating approval cycles with stakeholders.
- Integrated ML solutions with enterprise applications using REST APIs and microservices architecture, enabling seamless consumption of predictive insights across downstream healthcare platforms.
- Partnered with cross-functional teams including data engineering, QA, and client stakeholders to deliver production-ready ML solutions under strict SLAs, achieving 98% on-time delivery across multiple healthcare programs.
- Authored comprehensive technical documentation and model explainability reports to support audits, regulatory reviews, and client presentations, improving stakeholder confidence and adoption of ML-driven solutions.

Technical Skills

- **Programming Languages:** Python, SQL, Scala, Bash
- **Machine Learning Algorithms:** Linear & Logistic Regression, Random Forest, XGBoost, LightGBM, SVM, KNN
- **Deep Learning Frameworks:** TensorFlow, Keras, PyTorch
- **NLP & GenAI:** Transformers, BERT, GPT-based models, spaCy, NLTK, Hugging Face
- **Data Processing & Feature Engineering:** Pandas, NumPy, PySpark, Feature Stores
- **Big Data Technologies:** Apache Spark, Spark MLlib, Kafka, Hadoop
- **Cloud Platforms:** AWS (S3, EC2, SageMaker, Lambda, Glue), Azure ML, GCP
- **MLOps & Model Lifecycle:** MLflow, Kubeflow, Model Monitoring, Drift Detection
- **Databases:** PostgreSQL, MySQL, MongoDB, Snowflake
- **Data Visualization:** Power BI, Tableau, Matplotlib, Seaborn
- **DevOps & Deployment:** Docker, Kubernetes, CI/CD, GitHub Actions, Jenkins
- **Methodologies & Tools:** Agile Scrum, Jira, Confluence, REST APIs, FastAPI

Education

Master | University of Texas at Arlington, USA **Jan 2024 – Dec 2025**

Bachelor | Charotar University of Science and Technology, India **July 2019 – May 2023**