RUSHABH PATEL

Atlanta, GA 30188 | +15159818460 | rushabh.patel5@gmail.com | LinkedIn | Portfolio

Summary

Seasoned Machine Learning Engineer with expertise in designing and deploying machine learning algorithms, statistical analysis, and predictive modeling. Proven track record in leading generative AI initiatives, optimizing ML architectures, and improving system performance through innovative methods. Proficient in NLP, deep learning, Bayesian methods, and large-scale data processing.

Work Experience

Senior Machine Learning Engineer **12/2022 to Current**
VNS Health **New York, NY**

- **Generative AI Implementation:** Spearheaded deployment of generative AI to transcribe, parse, and structure call center audio calls, leveraging advanced open-source algorithms.
- Achieved significant improvements in healthcare outcomes and customer service experiences through advanced AI utilization.
- **ML Architecture Overhaul:** Led collaborative effort to revamp ML architecture, employing AWS SageMaker, Apache Airflow, and Feast feature store, ensuring scalable, reliable, and efficient infrastructure.
- **Rapid ML Development:** Introduced CI/CD-based architecture for ML, facilitating swift model development and deployment, significantly reducing time to production.
- **Cross-Functional Leadership:** Coordinated cross-functional teams to establish ML best practices, fostering innovation and excellence in AI applications within healthcare.
- **LLM Integration:** Enhanced AI-driven solutions by integrating state-of-the-art Language Model (LLM) techniques.

Techniques: LoRA, QLoRA, AWQ, GPTQ, SGLang, DeepSpeed, vLLM, FP6-LLM, LangChain, Guidance, LMQL, RAG, LamaIndex.
Technology Stack: Python, R, AWS SageMaker, Apache Airflow, Snowflake, Node.js, JavaScript, SQL, AWS.

Senior Machine Learning Engineer **10/2022 to 12/2022**
EvolutionIQ **New York, NY**

- Developed and deployed machine learning models for production, enhancing predictive accuracy.
- Conducted exploratory data analysis to identify ML opportunities, diagnose data issues, and establish model design, training, and evaluation frameworks.
- Proposed and implemented innovative features, resulting in improved model performance and refined business logic.
- Authored and peer-reviewed high-quality production code, ensuring robust and maintainable ML solutions.
- Engineered scalable machine learning models for claim time series forecasting and NLP text analysis, increasing processing efficiency.

Techniques: Time Series Forecasting, Gradient Boosting Machines (XGBoost, LightGBM), Deep Neural Networks.
Technology Stack: Python, TensorFlow, PyTorch, Dagster, BigQuery, Vertex AI, GCP, Terraform, Spark, and Kubernetes.

Senior Data Scientist **06/2022 to 10/2022**
AT&T **New York, NY**

- Partnered with industry leaders to pioneer advancements at the intersection of databases, knowledge graphs, and artificial intelligence.
- Developed innovative products leveraging knowledge graph technology to solve large-scale real-world problems.
- Designed and built AI and machine learning applications utilizing knowledge graph technology, driving cutting-edge advancements.

Techniques: Distributed computing frameworks for big data (Apache Spark).
Technology Stack: Graph Neural Networks, Gradient Boosting Machines (XGBoost, LightGBM), Deep Neural Networks, Python, Azure Databricks, H2O, PySpark, Palantir, REL, Julia, SQL.

Applied Data Scientist II **06/2020 to 06/2022**
Children's Hospital of Philadelphia **Philadelphia, PA**

- Utilized natural language processing techniques to transform clinical text into structured information.
- Employed deep learning methods to classify imaging studies with high accuracy.
- Applied Bayesian statistical models to analyze incomplete or missing patient data.
- Implemented machine learning models and cloud-based data processing pipelines, interpreting data to measure algorithm performance.
- Developed approaches to apply published machine learning models to imperfect clinical data, including creation of training datasets.
- Wrote high-quality, secure code to implement models and algorithms as APIs or service-oriented software solutions.
- Managed and scaled applications using container technology and cloud-hosted managed services.

Techniques: Named Entity Recognition (NER), Part-of-Speech Tagging, Dependency Parsing, Tokenization, Text Classification, Topic Modeling, Transfer Learning (VGG, ResNet, Inception), Data Augmentation, GANs, Ensemble Learning, Attention Mechanisms.
Technology Stack: Python, Apache Spark, BigQuery, Kubernetes, Argo Workflows, Dataflow, Apache Beam, Terraform, Docker, R.

Data Scientist **02/2019 to 06/2020**
VNS Health **New York, NY**

- Developed, built, tested, and deployed machine learning algorithms to support development of business processes for healthcare organization and subsidiary health plan provider, improving business outcomes and quality of care.
- Created and maintained framework for deploying machine learning algorithms using APIs.
- Utilized applications to implement, track, and monitor predictive models guiding business decisions.
- Engineered computational solutions and developed algorithms to meet predictive needs of clinical and business units.
- Identified clusters of patient sub-populations benefiting from targeted care management strategies, improving positive predicted value for patient outcomes based on sub-modeling for each cluster.
- Monitored accuracy of deployed algorithms; alerted management when performance declined and identified causes.
- Ensured data quality throughout all stages of acquisition and processing, including sourcing, collection, ground truth generation, normalization, and transformation.

Techniques: RESTful API Design, Random Forests, Gradient Boosting Machines (XGBoost), AutoML Tools (H2O.ai), Cross-Validation, Hyperparameter Tuning.
Technology Stack: R, SQL, Python, Apache Spark, Tableau, H2O.

Data Scientist **06/2017 to 01/2019**
Jvion **Atlanta, GA**

- Improved patient outcomes by developing statistical models in R and Python for healthcare research.
- Designed algorithms for recommended actions and interventions to prevent adverse events and deterioration.
- Performed cluster analysis to identify sub-populations of complex patients benefiting from targeted care management strategies, improving positive predicted value for patient outcomes through sub-modeling on each cluster.
- Analyzed targets including hospital readmission among AMI patients, inpatient visits, ER visits, MRSA among diabetes patients, congestive heart failure, C. diff, pressure injury, sepsis, and fall injury.
- Wrote complex SQL queries for data investigation and extraction for analysis.
- Built algorithms to drive population-level insights and expected ROI from predictive health analytics.

Techniques: Random Forests, Gradient Boosting Machines (XGBoost), Bayesian Inference, MCMC Methods, EM Algorithm, Imputation Techniques (Multiple Imputation), Hierarchical Models.
Technology Stack: R, SQL, Python, Apache Spark, Tableau, H2O.

Education

Doctor of Philosophy (PhD).: **Computer Science** **08/2020 to 05/2025 (Expected)**
Auburn University Auburn, AL

- Completing Ph.D. while working full time.
- Ph.D. student at Temple University from August 2020 - May 2022.

Master of Science: **Computer Science** **01/2016 to 05/2017**
University of Illinois at Springfield Springfield, IL

- Graduated with Honors award by College of Liberal Arts & Science for Excellent Academic Performance.
- Awarded Excellence award for research on healthcare analytics with SIU School of Medicine.
- GPA: 4

Bachelor of Science: **Computer Science** **06/2011 to 06/2015**
Symbiosis International University Pune, India

Publications

- **Patel, R.**, Guo, Y., Alhudhaif, A., Alenezi, F., Althubiti, S. A., & Polat, K. (2022). **Graph-based Link Prediction between Human Phenotypes and Genes**. *Mathematical Problems in Engineering*.
- Buxton, E. K., **Patel, R.**, Toumaian, M. R., & Raeeszadeh-Sarmazdeh, M. (2021). **Application of Protein Language Models to Low-N Engineering of Metalloproteinase Inhibitors**. In *Proceedings of the International Conference on Computational Science and Computational Intelligence (CSCI)*.
- Buxton, E. K., Vohra, S., Guo, Y., Fogleman, A., & **Patel, R.** (2019). **Pediatric Population Health Analysis of Southern and Central Illinois Region: A Cross-sectional Retrospective Study Using Association Rule Mining and Multiple Logistic Regression**. *Computer Methods and Programs in Biomedicine*.
- Vespa, L. J., Guo, Y., Der, M., **Patel, R.**, & Pan, X. (2017). **A Novel Reinforcement Sample Learning Strategy for Convolution Neural Network in Computer-Aided Diagnosis System for Breast Cancer**. Presented at the *Society for Imaging Informatics in Medicine (SIIM)* conference.