RUSHABH PATEL

Senior Machine Learning Engineer

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Summary

Innovative Senior Machine Learning Engineer with 7+ years experience in deploying cutting-edge AI and machine learning solutions across healthcare and technology sectors. Proven track record in leading generative AI initiatives, optimizing ML architectures, and ensuring adherence to SDLC standards. Expertise in NLP, deep learning, Bayesian methods, and large-scale data processing. Skilled in developing scalable solutions and enhancing business outcomes through advanced AI techniques.

Experience

VNS Health
Remote

Senior Machine Learning Engineer
12/2022 - Present

- **Generative AI Implementation:** Spearheaded the deployment of generative AI to transcribe, parse, and structure call center audio calls, leveraging advanced open-source algorithms. This initiative marks a significant leap forward in utilizing AI to improve healthcare outcomes and customer service experiences.
- **ML Architecture Overhaul:** Led a collaborative effort to revamp our ML architecture, employing AWS SageMaker, Apache Airflow, and Feast feature store, ensuring a scalable, reliable, and efficient infrastructure.
- **Rapid ML Development:** Introduced a CI/CD-based architecture for ML, facilitating swift model development and deployment, significantly reducing the time to production.
- **Cross-Disciplinary Leadership:** Coordinated with cross-functional teams to establish ML best practices, fostering an environment of innovation and excellence in AI application within healthcare.
- In addition to leading generative AI initiatives, I am deeply involved in integrating state-of-the-art Language Model (LLM) techniques to further enhance our AI-driven solutions.
  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.*

EvolutionIQ
New York

Senior Machine Learning Engineer
10/2022 - 12/2022

- Developed and deployed machine learning models for production, enhancing predictive accuracy.
- Conducted comprehensive 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 an improvement in 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 (e.g., XGBoost, LightGBM), Deep Neural Networks.*
  Technology Stack: *Python, TensorFlow, PyTorch, Dagster, BigQuery, Vertex AI, GCP, Terraform, Spark, Kubernetes.*

AT&T
Remote

Senior Data Scientist
06/2022 - 10/2022

- 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 in the field.
  Techniques: *Graph Neural Networks, Gradient Boosting Machines (XGBoost, LightGBM, etc), Deep Neural Networks,* Distributed Computing Frameworks for Big Data (Apache Spark).
  Technology Stack: *Python, Azure Databricks, H2O, PySpark, Palantir, REL, Julia, SQL.*

Experience

Children's Hospital of Philadelphia
Philadelphia
Applied Data Scientist II
06/2020 - 06/2022

- Utilized natural language processing techniques to transform clinical text into structured information.
- Employed cutting-edge deep learning methods to classify imaging studies with high accuracy.
- Applied statistical models, focusing on Bayesian methods, to help researchers analyze incomplete, erroneous, or missing patient data.
- Implemented statistical and machine learning models, large-scale cloud-based data processing pipelines, and off-the-shelf solutions for testing and evaluation, interpreting data to measure algorithm performance.
- Developed innovative approaches to apply published machine learning models to imperfect clinical data, including the creation of training datasets.
- Wrote high-quality, secure code to implement models and algorithms as APIs or other service-oriented software solutions.
- Managed and scaled applications using container technology and cloud-hosted managed service.
  Techniques: *Named Entity Recognition (NER), Part-of-Speech Tagging, Dependency Parsing, Tokenization, Text Classification, Topic Modeling, Transfer Learning (e.g., VGG, ResNet, Inception), Data Augmentation, Generative Adversarial Networks (GANs), Ensemble Learning, Attention Mechanisms.*
  Technology Stack: Python, Apache Spark, BigQuery, Kubernetes, Argo Workflows, Dataflow, Apache Beam, Terraform, Docker, R.

VNS Health
New York
Data Scientist
02/2019 - 06/2020

- Develop, build, test and deploy machine learning algorithms to support development of business processes for healthcare organization and subsidiary health plan provider, to improve business outcomes and quality of care.
- Create and maintain framework for deploying machine learning algorithms using APIs.
- Utilize resulting applications to implement, track and monitor predictive models used to guide business decisions.
- Engineer computational solutions and develop algorithms and applications to meet the predictive needs of clinical and business units across the Visiting Nurse Service of New York.
- Identify clusters of sub-populations of patients who may benefit from targeted care-management strategies: improves positive predicted value for patient outcomes based on sub-modeling for each cluster.
- Ensure accuracy of deployed algorithms is monitored on an ongoing basis; alert management when algorithm performance declines, identify causes.
- Ensure data quality throughout all stages of acquisition and processing, including sourcing, collection, ground truth generation, normalization & 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.*

Jvion
Atlanta
Data Scientist
06/2017 - 01/2019

- Improved patient outcomes by developing statistical models in R/Python for healthcare research.
- Design algorithms for the recommended actions/interventions that will best prevent adverse events and deterioration.
- Cluster analysis for identifying sub-populations of complex patients who may benefit from targeted care management strategies and improvising positive predicted value for patient outcome by sub-modelling on each cluster.
- Perform analysis on the targets including hospital readmission among Acute Myocardial Infarction.
- (AMI) patients, IP visits, ER visits, MRSA among diabetes patients, congestive heart failure, Clostridium difficile (C. Diff.), pressure injury, sepsis and fall-injury.
- Writing complex SQL queries for data investigation and mapping to extract data for analysis.
- Build algorithms to reduce predictive analytics in driving population-level insights and the expected ROI from predictive population health analytic solutions.
  Techniques: *Random Forests, Gradient Boosting Machines (XGBoost),Bayesian Inference, Markov Chain Monte Carlo (MCMC) Methods, Expectation-Maximization (EM) Algorithm, Imputation Techniques (Multiple Imputation), Hierarchical Models.*
  Technology Stack: *R, SQL, Python, Apache Spark, Tableau, H2O.*

PayTooth Software Solutions Limited
Pune
Co-Founder
07/2015 - 04/2016

- Innovated a solution for seamless money transfers in areas with limited or no cellular network coverage.
- Led the analysis of survey data on mobile payment gateways in India to shape a strategic product launch.
- Ensured compliance with SDLC standards across project implementation.

Education

Auburn University
Auburn, AL

Doctor of Philosophy PhD, Computer Science

08/2020 - Present

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

University of Illinois Springfield
Springfield

Master of Science (MS) in Computer Science

01/2016 - 01/2017

- 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.

Symbiosis international university
Pune, India

Bachelor of Technology (B.Tech.), Computer Science

01/2011 - 01/2015

Publications

Mathematical Problems in Engineering
2022

Graph-based link prediction between human phenotypes and genes

R Patel, Y Guo, A Alhudhaif, F Alenezi, SA Althubiti, K Polat

International Conference on Computational Science and Computational Intelligence (CSCI)
2021

Application of Protein Language Models to low-N Engineering of metalloproteinase inhibitors

Elham Khorasani Buxton, Rushabh Patel, Mari R Toumaian, Maryam Raeeszadeh-Sarmazdeh

Computer methods and programs in biomedicine
2019

Pediatric population health analysis of southern and central Illinois region: A cross-sectional retrospective study using association rule mining and multiple logistic regression

Elham Khorasani Buxton, Sameer Vohra, Yanhui Guo, Amanda Fogleman, Rushabh Patel

Society for Imaging Informatics in Medicine (SIIM)
2017

A Novel Reinforcement Sample Learning Strategy for Convolution Neural Network in Computer Aided Diagnosis System for Breast Cancer

Lucas J. Vespa, Yanhui Guo, Marakhi Der, Rushabh Patel, Xingyang Pan