

Umar Qureshi

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Professional Summary

Machine Learning Engineer with 7+ years of experience building and leading end-to-end ML solutions from concept to production, including model development and training, deployment, and scalable infrastructure development. Proven expertise in building ML systems from the bottom up, collaborating across functions, and driving impactful AI solutions in dynamic startup environments. Passionate about bridging the gap between cutting-edge AI research and real-world applications to create scalable, measurable outcomes.

Skills

Machine Learning & Data Science:

- Deep Learning Architectures: Encoder-Decoder models, CNNs, Transformers, LLMs
- Time Series Analysis and Segmentation
- Anomaly Detection
- Feature Engineering and Tree based Models
- Statistical Analysis & Data Wrangling
- Model Evaluation, Validation & Monitoring
- 3D Geometry & Motion Analysis: Quaternion-based Adaptive Kalman Filters, sensor fusion

Leadership & Collaboration:

- Project Roadmapping & Requirements Definition.
- Team Leadership: Leading ML teams and guiding projects from concept to completion.
- Cross-Functional Collaboration: Partnering with product managers, biomechanists, and software engineers to ensure cohesive project execution.
- Mentorship & Coaching.

- Problem Solving & Analytical Thinking: Tackling complex ML challenges with a data-driven approach.

Infrastructure & MLOPs:

- Tensorflow, Numpy, Pandas, Numba
- Cloud Platforms: Google Cloud Platform (GCP)
- Microservices
- MLOps Tools: Vertex AI, Dataflow - Apache Beam, Airflow, Kubeflow
- Version Control & Collaboration: Git, GitHub
- Containerization & Orchestration: Docker, Kubernetes, Cloud Run
- Infrastructure as Code: Terraform
- Continuous Integration and Deployment (CI/CD)

Agile Development

- Agile Methodologies: Sprint Planning, Iterative Development
- Product Ownership: Requirements definition and stakeholder alignment

Key Projects

Retrieval-Augmented Chatbot for Product Support

2025

- *Built a conversational RAG system using Gemini, Google Cloud Run, Firestore, and Vector Search to help users troubleshoot and learn the product.*
- *Designed a fully serverless, scalable architecture with custom document indexing and semantic search for fast, relevant retrieval.*
- *Expected to reduce manual support hours by 30% in Phase 1; Phase 2 will extend capabilities to internal enterprise search across meetings, projects, and company data.*

Gait Understanding Engine

2021

- *Built a deep learning encoder-decoder model to segment time-series gait data into gait phases with 20 ms accuracy.*
- *Devised data collection, labeling, and training pipelines; deployed as a microservice using Google Cloud Run with Docker.*
- *The backbone model for 80% of downstream applications, uniquely enabling metrics like ground contact times, flight times, jump heights etc.*
- *Addressed data shifts with a human-in-the-loop feedback retraining mechanism, saving time and improving accuracy.*

Fine Grained Activity Recognition

2024

- *Developed a deep model with 5M+ parameters for nuanced athletic activities like jumps and runs.*
- *Achieved 99% accuracy for jump detection, meeting key business needs for athlete performance analysis.*
- *Innovatively used isolated activity data and the Gait Understanding Engine to generate training data, overcoming the practical limits of data collection.*

Metric Ranking

2023

- *Created and trained a neural network to prioritize metrics based on activity significance, enhancing personalized user feedback.*
- *Trained periodically with user data via Airflow, deployed as a microservice on Google Cloud Run.*
- *Improved user satisfaction by highlighting the most relevant metrics first, enabling feed generation and improved analysis.*

Automatic Sensor Orientation Prediction

2024

- *Built a model to infer sensor orientation from real world movement data, eliminating setup complexity and reducing user errors from 5% to 0.5%.*
- *Deployed as a microservice on Google Cloud; enhanced user experience and reduced operational overhead.*

Quaternion Adaptive Kalman Filter for Movement Speed & Distance Estimation

2022

- *Designed a quaternion-based adaptive Kalman filter to estimate speed and distance without GPS.*
- *Helped coaches tailor training by tracking time spent at various speed bands, leading to two major client acquisitions.*

Kalman Filter Fusion Phase Prediction

2023

- *Developed a model to predict optimal times for correcting sensor drift during gait cycles. Feeding directly into the Adaptive Kalman filter.*
- *Integrated with the Gait Understanding Engine, improving speed estimation accuracy and reducing manual calibration.*

Metrics Simplified

Inprogress

- *Leveraging the solution from the product RAG chatbot, and enhancing it to act as an agent to simplify technical metrics, providing users with clear, accessible insights into their performance.*
- *Expected to reduce user confusion and increase engagement by delivering information in a layered, user-friendly format.*

Professional Experience

Lead Machine Learning Engineer

Oct 2022 – Present

Plantiga Technologies, Vancouver, BC, Canada

- *Led the development of machine learning solutions from concept to production, driving alignment with business needs and ensuring impactful, deployable outcomes.*

- Built scalable infrastructure for model training and deployment, leveraging cloud computing to ensure reliability, scalability, and efficiency.
- Defined project goals, technical requirements, and timelines, translating business requirements into actionable projects and delivering tangible results.
- Collaborated closely with cross-functional teams—including product managers and domain experts—to integrate ML capabilities that directly enhanced user engagement and overall product quality.

Machine Learning Engineer

May 2018 – Sep 2022

Plantiga Technologies, Vancouver, BC, Canada

- *Developed and deployed machine learning models for time-series data analysis, focusing on model training, evaluation, and optimization.*
- *Built and optimized data pipelines using Apache Beam and Airflow, reducing processing time by 30%.*
- *Supported cross-functional team efforts to iterate on data collection, processing, and product features, helping to translate data-driven insights into product enhancements.*
- *Contributed significantly to core ML architecture and production-ready model integration, supporting data-driven business strategies.*

Research Assistant

Jan 2016 – Sep 2019

Simon Fraser University, Vancouver, BC, Canada

- *Conducted research on wearable sensor technologies to analyze head impacts and concussions in sports, developing a working head-worn prototype device to track impact kinematics.*
- *Designed a novel, low-cost calibration algorithm to improve sensor accuracy.*
- *Published findings in IEEE journal, detailing the proposed calibration methods and the impact on wearable technology accuracy.*

Education

MASc Mechatronic Systems Engineering

2016 – 2019

Simon Fraser University, Vancouver, BC, Canada

- *Research Focus: Wearable technology, Sensor Calibration, Motion algorithm development, Pattern Recognition.*
- *CGPA 4.02*

Bachelor of Engineering in Electronics

2008 – 2012

Dawood College of Engineering & Technology, Karachi, Pakistan

- *CGPA 4.0*

Publications

- *Umar Qureshi and Farid Golnaraghi, "An Algorithm for the in-field calibration of a MEMS IMU," IEEE Sensor Journal* 2017
- *Umar Qureshi and Farid Golnaraghi, "An Algorithm for Kinematics and Location Detection in Head Impacts", Masters Thesis* 2019

Interests

- *Traveling*
- *Skiing*
- *AGI*
- *Technology's Impact on Society*