Maithil Tandel

Machine Learning Engineer
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Professional Summary

Machine Learning and Data Scientist with **3+ years of experience** architecting end-to-end forecasting, anomaly detection, and analytics pipelines across the energy and manufacturing sectors. Proficient in **Python, time series modelling, statistical analysis, and production deployment** using XGBoost, LSTM, FastAPI, and AWS/GCP ecosystems. Delivered energy-focused solutions including **MAPE less than 6%** EU electricity price forecasts and **94% precision** anomaly detection. Passionate about solving complex problems, making real-world impact through data, and continuously learning.

Skills

- **Statistical Inference and Experimentation:** Causal Modelling (DoWhy, EconML), A/B Testing, Hypothesis Testing, Regression Analysis, Counterfactual Simulation, Uncertainty Quantification, Effect Size Estimation
- **Machine Learning and Predictive Modelling:** Supervised and Unsupervised Learning, Anomaly Detection, Recommendation and Similarity Models, Ranking and Prioritisation Algorithms, Clustering (K-means, DBSCAN), Time Series Forecasting (Prophet, XGBoost, LSTM)
- **Programming and Analytical Tools:** Python (Pandas, NumPy, Scikit-learn, PyTorch, TensorFlow, Statsmodels), SQL, PySpark, Jupyter, Git, Bash
- **Data Engineering and Automation:** FastAPI, Flask, Docker, AWS Lambda, Airflow, Celery, REST API Development, CI/CD Pipelines, Model Versioning, Automated Retraining and Monitoring Workflows
- **Data Infrastructure and Cloud Platforms:** AWS (EC2, S3, SageMaker), Google Cloud (BigQuery), Azure ML, MLflow, PostgreSQL, Redis, Data Pipeline Orchestration
- **Data Visualisation and Reporting:** Tableau, Power BI, Looker, Plotly, Seaborn, Matplotlib, Grafana, Streamlit Dashboards, KPI Tracking and Experiment Dashboards
- **Business and Product Analytics:** Marketplace Dynamics, Unit Economics Optimisation, Retention and Growth Analysis, Pricing Models, Strategic Decision Support, Experimentation Framework Design
- **Soft and Professional Skills:** Cross-Functional Collaboration, Strategic Thinking, Communication with Non-Technical Stakeholders, Agile Delivery, Mentoring and Knowledge Sharing

Work Experience

Data Scientist | **EXCELR8 Motorsport** | **Nottingham, UK (Hybrid)** ***May 2024 – Dec 2024***

- Partnered with Product and Operations teams to design **predictive models** for race efficiency, improving decision accuracy by 11%.
- Reduced telemetry data volume by 85% using **autoencoder compression**, enabling faster simulation cycles and saving over 2.5GB per session.
- Applied **causal inference** on sensor-level inputs to identify key drivers of lap time variance across 18 race events.
- Clustered driver behaviour via **K-means segmentation**, informing adaptive strategy design and improving consistency across 6 drivers.
- Built a modular data framework in Python and SQL for telemetry ingestion, powering real-time dashboards for cross-team review.

Machine Learning Engineer | **Kennametal Inc.** | **Bengaluru, India (On-Site)** ***Jan 2023 – Aug 2023***

- Conducted **statistical experimentation (DOE + regression)** to optimise 12 powder compositions, reducing defect rates by 18%.
- Designed **causal models** to quantify process improvements, guiding production planning across 40+ trials.
- Built anomaly detection pipelines on PySpark, cutting downtime by 22% and saving approximately £8,000 per month.
- Automated data collection across 5,000+ experiments using SQL and Python, accelerating analysis throughput by 40%.
- Created a centralised analytics dashboard using Power BI for process monitoring and KPI reporting across production lines.

Deep Learning Engineer | **ResoluteAI.in** | **Bengaluru, India (Remote)** ***Oct 2021 – Nov 2022***

- Developed **unsupervised anomaly detection systems** analysing 1.2M+ financial transactions to flag early risk signals.
- Applied **A/B testing and causal evaluation** to quantify fraud model improvements, reducing false negatives by 20%.
- Deployed scalable ML APIs using AWS Lambda and REST interfaces, achieving sub-300ms latency for real-time detection.
- Built NLP models using BERT to automate support ticket triage, cutting manual resolution time by 35 minutes per batch.
- Created CI/CD frameworks with automated retraining, ensuring reproducible and auditable model deployments.

Computer Vision Research Engineer | **Smaaash Entertainment** | **Mumbai, India (Remote)** ***Jun 2021 – Oct 2021***

- Designed real-time **vision-based behavioural models** running at 30 FPS with under 80ms latency on consumer GPUs.
- Prototyped similarity and recommendation modules to personalise gameplay based on player motion patterns.
- Collaborated with game developers and UX teams to translate analytics into actionable engagement insights.
- Evaluated algorithmic accuracy across 10 lighting and motion conditions, maintaining 92%+ detection reliability.
- Documented data pipelines and reproducibility workflows to ensure scalable experimentation across future AR/VR projects.

Projects

Causal Impact Analysis Dashboard for Marketing Campaigns | *Evaluating business impact of multi-channel marketing interventions*

- ***Tech Stack: Python (DoWhy, EconML, Pandas), Streamlit, PostgreSQL, Docker, AWS EC2***
- Built an **end-to-end causal inference pipeline** to estimate treatment effects of marketing campaigns across email, social, and ad spend data.
- Simulated 20K+ customer interaction records and applied **propensity score matching** to identify uplift from targeted offers.
- Developed a **Streamlit dashboard** for marketers to run counterfactual analyses and visualise campaign ROI in real-time.
- Containerised the application with **Docker** and deployed via **AWS EC2** for reproducible and scalable access.
- Achieved 6.4% mean absolute error in uplift estimation, supporting strategic ad budget optimisation.

Real-Time Marketplace Anomaly Detection API | *Detecting irregularities in key business metrics* **May 2025**

- ***Tech Stack: Python, Scikit-learn, PyCaret, FastAPI, Redis, Grafana, Docker, AWS Lambda***
- Built an **automated anomaly detection service** monitoring conversion rates, CTR, and churn across 30+ simulated metrics.
- Trained Isolation Forest and Autoencoder models, achieving 0.91 precision and 0.88 recall on validation datasets.
- Deployed the model as a RESTful API with average response latency under 250ms and connected to **Grafana dashboards** for visual monitoring.
- Automated ingestion of live metric streams using **Redis and AWS Lambda** to simulate real-time production data flow.
- Detected 4 to 6 anomalies daily in simulation runs, demonstrating early issue detection for business KPIs.

Customer Support Ticket Prioritisation Engine | *Automated triage and ranking of support queries using NLP* **March 2025**

- ***Tech Stack: Python, Transformers (BERT), Scikit-learn, FastAPI, Celery, PostgreSQL, Docker***
- Created a **BERT-powered prioritisation system** analysing 10K+ support tickets with metadata on sentiment, urgency, and customer tier.
- Engineered an **urgency scoring model** combining NLP features and SLA metrics to rank tickets for faster resolution.
- Achieved 17% faster response time for high-priority queries in benchmark simulations compared to FIFO baselines.
- Deployed via **FastAPI** with asynchronous task management through **Celery**, enabling scalable batch scoring.
- Built a lightweight triage dashboard with PostgreSQL backend to display real-time ticket rankings for support agents.

Education

University of Nottingham | **MSc Machine Learning in Sciences** | **Nottingham, UK** **Sep 2023 – Sep 2024**
Relevant Modules: Neural Computation, Data Analysis, Predictive Modelling, Machine Learning, Big Data, Computer Vision
Dissertation: *Optimizing Motorsport Performance: Predicting Ideal Lap Times and Extracting Feature Boundaries through Data-Driven Approaches Using Driving Style Patterns of the Racer*

Gujarat Technological University (GTU) | **B.E in Mechatronics, Robotics, and Automation** | **India** **Jul 2019 – Jul 2023**
Relevant Modules: Machine Learning, Statistics, Cloud Computing, Data Handling
Microsoft Learn Student Ambassador and Github Campus Expert
Dissertation: *Drone Photogrammetry – Built a drone-based 3D terrain mapping system integrating aerial image stitching, coordinate triangulation, and surface reconstruction for land survey applications.*

Publications

- **ONNX for Underwater Plastic Detection** | **Open Source For You** **Aug 2023**
- **Multistep Data Driven Short Term Electrical Load Forecasting using LSTM** | **IEEE Xplore** **Feb 2022**

Certifications

- **TensorFlow Developer Certificate** | TensorFlow / DeepLearning.AI **Apr 2024**
- **Natural Language Processing Specialisation** | DeepLearning.AI / Coursera **Feb 2024**
- **Responsible AI** | Microsoft / DataCamp **Dec 2023**
- **Generative AI with LLMs** | DeepLearning.AI / Coursera **Nov 2023**
- **Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning** | Coursera **Jun 2021**
- **IBM Data Science Professional Certificate** | IBM / Coursera **Mar 2021**
- **Unsupervised Learning: Clustering** | upGrad **Jan 2021**
- **Data Analytics Using MS Excel** | The Sparks Foundation **Nov 2020**