

Obaid Malik

Data Scientist | ML Engineer | AI Systems | LLM/NLP + MLOps | Smart Energy + IoT
PhD Computer Science (2016) | MSc AI (2010) | MSc Eng. Mgmt (2009) | BIT (2005)
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[Portfolio](#)

SUMMARY

Experienced machine learning and data science specialist with a strong track record of delivering scalable, real-world solutions across energy, housing, and infrastructure domains. Combining deep expertise in predictive modeling, digital twins, and embedded sensing to build end-to-end systems that bridge data, simulation, and decision-making. Proven ability to lead complex technical projects and translate domain challenges into production-grade models, with strengths in time-series analytics, geospatial analysis, and cloud-native ML deployment.

EXPERIENCE

Data Scientist

Nov 2021 – Apr 2025

Switchce Ltd.

London, UK

- Applied ML and simulation to sensor data from 10K+ homes to improve mould risk prediction, detect fuel poverty, and support retrofit strategies.
- Built a **digital twin-driven mould model** using **condensation physics**, **biological growth stages**, and rolling humidity exposure windows. Deployed via **AWS Glue and Lambda**. Improved detection latency by over 90% while improving robustness and reducing prediction coverage gaps by 26%.
- Developed **fuel poverty classifiers** by detecting abnormal post-heating temperature drops (rebound patterns) and usage anomalies using lag features and calibrated thresholds. Enabled early identification of fuel-poor households to support targeted outreach and energy assistance programs
- Modeled **thermal comfort**, **heat loss**, and **time-to-heat performance** using digital twins and clustering of sensor patterns to assess heating system efficiency. Findings featured in [NEA Magazine \(Autumn 2023\)](#).
- Presented actionable insights through dashboards and webinars to PMs, partners, and local authorities, driving stronger stakeholder engagement and data-informed decision making.
- **Impact:** Operationalised ML workflows across 2,000+ homes. Contributed to increased customer trust and company growth, supporting a successful £5M funding round.

Research Fellow (AI, IoT, Data Science)

Nov 2016 – Nov 2021

University of Southampton

Southampton, UK

- Delivered applied ML, embedded systems, and simulation projects for energy, defence, and sustainability use cases. Supervised PhDs and led multi-disciplinary teams in both academic and industrial settings.
- *Shell Decarbonisation (2020–21)*: Simulated carbon tax policies for shipping using **agent-based models**, **fleet CO₂ predictors**, and **mixed-integer optimisation with CPLEX**. Influenced internal decision-making; published in [AAMAS 2022](#).
- *Zero Power Smart Meter (2019–20)*: Designed an **ultra-low-power IoT water meter** with onboard energy harvesting. Developed **Gaussian Process leak detection** for sparse time-series data. Reduced latency from days to hours; extended from PhD research.
- *BAE ML Consultant (2019)*: Built a secure voice analytics prototype using **Google Cloud Speech**, **speaker segmentation**, and **3D routing**. Used NLP to extract mission-critical data from audio. Delivered functional system under NDA.

- *Chariot Agile (2016–17)*: Created an open-source sensing and analytics platform for housing energy pilots. Built custom **firmware**, backend forecasting tools, and front-end dashboards. Published and deployed across multiple pilot homes.
- *ReFresh CO₂ (2016–17)*: Investigated cognitive impact of indoor air quality using **EEG signals**. Applied time-series feature extraction and modeling in Python. Findings published on [bioRxiv](#).

Research Programmer (IoT, Data Science, Energy Dashboards)

Nov 2010 – Dec 2012

University of Southampton

Southampton, UK

- *Building Banter (2010–12)*: Developed a gamified dashboard using **PHP, JavaScript, MySQL** and live sensor scoring to drive energy-saving behaviour in factories.
- Built firmware for **GPRS-enabled ATmega microcontrollers** with RTC scheduling and low-power design. Integrated with environmental and occupancy sensors.
- **Impact**: Demonstrated measurable energy reduction; informed [UCL-led research](#) on behavioural energy interventions.

PROJECTS

Urban Mobility Scenario Explorer (Skyrall Applied Scientist role demo)

In Progress

- Developing a scenario analysis tool to evaluate the impact of proposed **tramline extensions** on urban accessibility using real-world **OpenStreetMap (OSM)** data and **network graph modelling**.
- Implements **shortest-path algorithms**, geospatial queries, and user-defined tramline routing via dropdowns to assess accessibility changes across key hub locations.
- Tech stack: **Python, Streamlit, OSMnx, NetworkX**.
- **Links**: [GitHub Repo](#), [Live Demo](#)

Building Energy Simulation and Retrofit Advisor

In Progress

- Automating building model generation from public EPC records and floorplans to simulate energy performance using **EnergyPlus**.
- Integrates property data extraction, zone mapping, construction assignment, and HVAC configuration into an end-to-end pipeline.
- Provides actionable retrofit suggestions based on heating demand, system types, and cost-effectiveness of improvements.
- Tech stack: **AWS, Python, Flask, EnergyPlus, OpenStudio, PostgreSQL, BeautifulSoup**.

SKILLS

- **Programming**: Python, SQL, Bash, JavaScript
- **ML/AI Frameworks**: scikit-learn, XGBoost, MLflow
- **Data Stack**: Pandas, NumPy, Dask, PostgreSQL, InfluxDB, Spark
- **Visualization & UI**: Streamlit, Dash, Plotly, Matplotlib
- **Simulation & Geospatial**: EnergyPlus, OpenStudio, OSMnx, NetworkX, GeoPandas
- **Cloud Platforms**: AWS (SageMaker, Lambda, Glue, S3), Google Cloud Platform
- **DevOps & MLOps**: Docker, GitHub Actions, CI/CD, Grafana
- **Specialised Areas**: Agent-based modelling, Time-series forecasting, Digital twins, API development
- **Soft Skills**: Technical leadership, Stakeholder engagement, Research supervision, Cross-functional collaboration

CERTIFICATIONS

- IBM AI Engineering Professional Certificate – Coursera (in progress)
- SQL Masterclass – Udemy (2024)
- Generative AI: Introduction to LLMs – LinkedIn Learning
- Project Management: Stakeholder Management – Udemy
- AWS AI Practitioner – Amazon (planned)