KIRANKUMAR ASHOK PATIL

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PROFILE

Production-focused **Quantitative Analyst** specialising in Battery Energy Storage Systems (BESS). Experienced in building **MILP optimisers, probabilistic market forecasts** (DC/DM/DR, FR tenders), **automated trading solutions**, and P&L attribution for UK energy markets. Strong track record integrating telemetry and physical battery models (SoC/SoH, degradation, round-trip efficiency) with market-facing **bidding strategies** (day-ahead, EPEX M7 intraday, NIV-chasing). Production-grade **Python developer** comfortable delivering decision-support tools for 24/7 trading desks and leading vendor selection/onboarding of third-party optimisers and data providers.

CORE COPETENCIES

- **Market & Trading:** Probabilistic forecasting (DC/DM/DR, FR) · Day-ahead & intraday (EPEX M7) · NIV-chasing · Balancing Mechanism & cash-out mitigation
- **Optimisation & Testing:** MILP & stochastic optimisation · Back-testing · Strategy development for bidding engines
- **Asset Modelling:** SoC/SoH, degradation and round-trip efficiency modelling · Telemetry reconciliation
- **Commercial & Reporting:** P&L attribution · KPI reporting · Peer benchmarking · GB market codes & compliance
- **Systems & Delivery:** Automated trading systems · Decision-support tools · Third-party optimiser evaluation & onboarding
- **Tech & Data:** Python (production: pandas, NumPy, scikit-learn, Pyomo) · Gurobi/CPLEX · Julia · MATLAB/Simulink · SQL · Git · Docker · Tableau · Power BI

TECHNICAL SKILLS

- **Languages & Tools:** Python (pandas, NumPy, scikit-learn, Pyomo) · Julia · MATLAB/Simulink · SQL · Git · Docker
- **Solvers & ML:** Gurobi · CPLEX · Forecasting libraries · PyTorch/TensorFlow (basic)
- **Visualisation & Office:** Tableau · Power BI · Advanced Excel

PROFESSIONAL EXPERIENCE

Natpower UK, London, United Kingdom, Software Development Engineer   **July 2024 - Present**

NatPower Group, a global energy transition developer

- Developed a MILP-based BESS optimisation engine for UK markets (multi-GW portfolio), integrating price & availability forecasts to produce day-ahead and intraday schedules.
- Designed and back-tested automated bidding strategies for day-ahead auctions and intraday (EPEX M7) markets; implemented NIV-chasing logic and cash-out hedging rules.
- Built probabilistic forecasting pipelines (DC/DM/DR and FR tender scenarios) and integrated uncertainty into optimisation constraints to improve realised revenue vs deterministic baselines by 10%.
- Implemented telemetry reconciliation routines to align physical battery models (SoC/SoH, degradation, round-trip efficiency) with SCADA data for runtime decision support.
- Led vendor evaluation and onboarding for third-party optimisers and data providers: created performance metrics, SLA KPIs and monitoring dashboards.

Adani Electricity Mumbai Limited, Mumbai, India, Senior Executive   **Dec 2020 – Jul2022**

India's Largest Private Power Company

- **Coordinated technical planning** and system integration using SAP, ensuring seamless incorporation of new network demands with existing infrastructure.
- **Collaborated with cross-functional teams** and regulatory bodies (MMRDA, MCGM, CSMIA) to optimize system performance, achieving a **15% increase in operational efficiency** and a **20% reduction in downtime**.

YogTech Batteries, Miraj, Maharashtra, Internship Trainee   **July 2020 - Oct 2020**

A truly technology driven company, manufacturing flexible, scalable lithium batteries as a prime source of power

- **Tested and validated** new battery cell technology, achieving **15% higher energy density**, which contributed to process optimization and improved hardware performance.
- **Managed supply chain processes** to support uninterrupted production, gaining practical insights into **hardware/software integration** and effective stakeholder communication.

PROJECTS

MILP BESS Optimiser – Natpower Uk
- Full-stack development of a MILP scheduler for multi-GW BESS deployment: data ingestion → probabilistic forecasting → optimisation → post-processing for trading desk. Integrated market rules (EPEX, BM) and telemetry reconciliation.

Marine BESS Optimiser – Natpower Marine
- Developed a scheduling algorithm to optimise charging for 100+ MW vessel chargers at UK ports, ensuring compliance with port power limits and improving utilisation.

EDUCATION

MSc in Applied Artificial Intelligence, Cranfield University, Cranfield, UK   **Sept 2023 – Sept 2024**
- **Modules:** Deep Learning, Intelligent Cyber-Physical Systems, Statistical Learning, Optimization, Automated Reasoning
- **Individual Research Project:** Developed an **AI solution** for "Airborne Vision-Based Navigation and UAS Positioning" using **optimized SLAM** and **vision transformers** to deliver real-time performance.
- **Group Project:** Designed **multi-agent reinforcement learning** algorithms for dynamic airspace pricing, balancing drones and manned aircraft operations.
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B.Tech in Electrical Engineering, Walchand College Of Engineering, India   **June 2016 - October 2020**

- Modules: **Power Electronics, Analogue and Digital Electronics, Micro Processor, Digital Signal Processing**, **Power Systems**
- Led "**Underground Cable Fault Distance Locator**" project, guided team to the on-time completion of both the **MATLAB Simulink** Model and prototype, by delegating tasks among team members and overseeing progress, ensuring efficient workflow and collaboration.
- Deployed HC-05 BT module with **Arduino for home automation** during pre-final year of degree

CERTIFICATIONS

- **Machine Learning and AI Foundations**: Causal Inference and Modelling
- **Data Analytics** Bootcamp completion certification from TATA Neuskills using python, SQL and other tools
- **Neural Networks** and Convolutional Neural Networks Essential Training
- **Git** Essential Training
- **Mi – Power**, Power System Network Analysis
- **Lean Six Sigma Green Belt**, Operational risk reduction and resilience enhancement

EXTRACURRICULAR ACTIVITIES

Leadership & Community:

- Career Representative at Cranfield University, facilitating job placements and networking.
- Active member of the IEEE Computer Society.
- Toastmasters International – Developing strong communication and leadership skills.

Volunteer Work:
- Engaged with the London Borough of Newham on community well-being initiatives.
- Organized cultural, environmental, and inter-college events, driving community engagement