Haotian MA

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EDUCATION

University College London	London, United Kingdom
Ph.D. in Systems Modelling and Optimisation	*2023 – 2026*
University of Warwick	United Kingdom
M.Res. in Control Engineering — Distinction (GPA: 4.0/4.0)	*2021 – 2023*
University of Nottingham	United Kingdom
M.Sc. in Electrical and Electronic Engineering	*2019 – 2021*
Southeast University	China
B.Eng. in Energy and Power Engineering — Outstanding Graduate (Top 5%)	*2015 – 2019*

PROFESSIONAL EXPERIENCE

Huawei European Research Institute — May 2023 – May 2025
Research Engineer — Uncertainty Modelling and Optimisation — *Munich, Germany*

- Developed **scenario-based optimisation models** for **20-year capacity sizing and investment planning** of **data-centre energy infrastructure**, explicitly targeting **resilience and decarbonisation under uncertainty**.
- Designed **uncertainty-aware scenario-generation pipelines** (10^4+ scenarios) capturing **load volatility**, renewable intermittency, and market shocks to evaluate **robustness under adverse operating regimes**.
- Formulated and solved **large-scale MILP and nonlinear optimisation problems** (**100+ decision variables**) with coupled operational constraints to quantify **cost–emission–reliability trade-offs** across alternative **data-centre energy system designs**.
- Implemented **time-resolved stochastic simulations** (**1-minute resolution**) to identify **worst-case constraint violations and tail-risk exposure** in **data-centre operations** under extreme demand–supply scenarios.
- Improved optimisation **numerical stability and convergence efficiency by 12.5%**, enabling scalable **sensitivity and robustness analysis** for **data-centre-scale scenario sets [3]**.

Global Energy Interconnection Research Institute (GEIRI Europe) — Oct 2021 – Apr 2023
Research Engineer — Systems Modelling and Optimisation — *Birmingham, United Kingdom*

- Developed and validated **physics-informed nonlinear models** for **electrolysers and lithium-ion battery subsystems**, supporting **data-centre-relevant technology assessment and capacity planning**.
- Constructed **multi-scale simulation frameworks** linking electrochemical component dynamics (electrolysers, batteries) to **system-level efficiency, cost, and reliability metrics** in integrated energy systems.
- Integrated **MILP-based planning models** with dynamic MATLAB/Simulink simulations to analyse **capacity allocation, power-sharing, and operational feasibility** for **large-scale, reliability-critical data-centre loads**.
- Performed **large-scale parameter estimation and uncertainty analysis** ($> 10^4$ samples) using nonlinear least squares and Bayesian filtering, improving **robustness and credibility of performance projections [1] [2]**.

PUBLICATIONS(SELECTED)

[1] Technical and Economic Performance Assessment of Blue Hydrogen Production Using a New Configuration
International Journal of Greenhouse Gas Control, 2024. Method: **Techno-economic optimisation**, Sensitivity Analysis.

[2] Multiscale Modeling and Electrochemical Validation of PEM Electrolyzer-Coupled Hybrid Systems *IEEE GPECOM*, 2025. Method: Multiscale Dynamic Modeling.

[3] System Modeling and Sizing Optimisation of PEM-Integrated Hybrid Energy Storage for Data Centre Resilience *IET Energy Systems (ESPE)*, 2025. Method: **Constrained optimisation**, Resilience Analysis.

SKILLS

Quantitative Systems Modelling: Python (NumPy, Pandas, SciPy, Numba), C++, SQL; large-scale numerical modelling, stability-aware simulation design, performance profiling, and reproducible analytical pipelines.
Uncertainty, Risk & Scenario Analysis: Monte Carlo simulation, stochastic and convex optimisation, scenario generation, global sensitivity analysis, tail-risk and downside exposure assessment.
Valuation & Decision Analytics: discounted cash-flow modelling, multi-curve discounting frameworks, cash-flow sensitivity (DV01/PV01-equivalent), risk-adjusted performance attribution, and capital-allocation trade-off analysis.
Market & Stress-Test Analysis: volatility characterisation, liquidity and shock transmission metrics, stress-testing and adverse-scenario design for long-horizon investment and infrastructure resilience evaluation.