

Andrey Churkin

Quantitative Energy Markets Analyst with a PhD in Engineering and 9+ years of experience building optimisation, machine learning, and forecasting models. Develops data-driven solutions for market analysis, battery storage trading, power system planning, and operational decision support. Experienced with large energy, weather, and market datasets.

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Experience:

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- Mar 2024 present **Imperial College London**, Dyson School of Design Engineering, London, UK
Research Associate in AI and Analytics for Electricity Markets
- Built forecasting and anomaly detection tools for BESS trading in European intraday electricity markets, using 27.3M bid/ask price updates from 8,737 DK1 sessions ([ViPES2X](#) project). Demonstrated that anomalous trading patterns can be reliably detected after only 30% of the trading session.
 - Developed weather-driven analytics for real-time dynamic line rating in UK distribution networks, using multiple weather and climate datasets ([3DAR](#) project). Quantified thermal line limits and demonstrated potential average capacity uplifts of 12–47% across analysed circuits.
 - Designed forecast valuation mechanisms for electricity data markets, combining optimisation models, cooperative game theory, and Monte Carlo simulation.
- Mar 2021 **The University of Manchester**, Department of Electrical and Electronic Engineering, Manchester, UK
Mar 2024 *Research Associate*
- Built optimisation models for large-scale European power systems across the UK, Croatia, Spain, and Portugal (Horizon 2020 [ATTEST](#) project).
 - Implemented recursive optimisation workflows for system planning and operational analysis, demonstrating up to 57% reductions in investment costs and embodied carbon vs BaU planning.
 - Developed quantitative models of DER flexibility in distribution networks, identifying operational constraints and coordination challenges.
- May 2017 **United Nations ESCAP**, Energy Division, Bangkok, Thailand
Sep 2017 *Intern*
- Built optimisation models for cross-border power trading and transmission investment in Northeast Asia, showing potential generation cost savings of \$7.84bn per year from regional cooperation.
- May 2016 **CROC Inc.**, IT department, Moscow, Russia
Oct 2016 *Engineer in Industrial Solutions for Energy*
- Prepared network data and validated state estimation results for the integration of PSControl SCADA across 6 regional distribution networks.
- Feb 2015 **Moscow Power Engineering Institute**, Electrical Power Systems Department, Moscow, Russia
May 2016 *Engineer*
- Developed training simulator software for electrical substation operations. Co-inventor on a patent for the training interface system and simulator design.

Education:

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- Oct 2016 **PhD in Engineering Systems**
Nov 2020 Skolkovo Institute of Science and Technology (Skoltech), Moscow, Russia
Thesis title: Stability analysis in coalitional games for cross-border power interconnection planning
- Sep 2014 **MSc in Electrical Engineering**, graduated with honours (average score 4.94 / 5.00)
Jun 2016 Moscow Power Engineering Institute, Electrical Power Systems Department, Moscow, Russia
- Sep 2010 **BSc in Electrical Engineering**, graduated with honours (average score 4.79 / 5.00)
Jun 2014 Moscow Power Engineering Institute, Electrical Power Systems Department, Moscow, Russia

Skills:

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- Core:** European power markets, power system fundamentals, energy economics, time series forecasting, machine learning, feature engineering, anomaly detection, data visualisation & communication, mathematical optimisation (linear, nonlinear, mixed-integer, stochastic), statistical modelling.
- Programming:** Python (NumPy, Pandas, Scikit-learn, LightGBM, Pyomo, Xarray, GeoPandas, PandaPower), Julia (JuMP, PowerModels, PowerModelsDistribution, DataFrames, Flux), Gurobi, Ipopt.
- Other tools:** Git, AWS SageMaker, LLM-assisted coding and information extraction, deep learning methods, data visualisation libraries, graph analytics (Gephi, NetworkX), LaTeX.

Interests: Chess ([FIDE rating](#) 1619), classical piano, Brazilian jiu-jitsu

Languages: English (fluent), Russian (native), Mandarin Chinese (intermediate), Spanish (intermediate)