Manqi Xu

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EDUCATION

Tsinghua University Sep 2022 – Present

Master of Science in Electrical Engineering/ Data Science and Information Technology (GPA: 3.95/4.0) *Beijing, China*

- Supervised by: Prof. Ye Guo
- Relevant Courses: Optimization Theory and Machine Learning, Machine Learning, Learning from Data, Power Systems and Market Operations, Large Network Steady-State Analysis

North China Electric Power University Sep 2018 – Jun 2022

Bachelor of Science in Management Science and Technology (Overall Grade: 88.84/100) *Beijing, China*

- Supervised by: Prof. Cheng Lu
- Relevant Courses: Operational Research, Probability and Statistics, Game Theory, Microeconomics, Power System Analysis, Production and Operation Management, Engineering Statistics
- Thesis: Object Detection of Concrete Disease based on YOLOV3 (Best Thesis Award)

TECHNICAL SKILLS

Programming: Python, MATLAB, SQL and C/C++

Languages: Mandarin (Native), English (Fluent), German (Rudimentary)

PUBLICATIONS

Journal

- **Manqi Xu**, Ye Guo and Hongbin Sun, "Bidding and Dispatch Strategies with Flexibility Quantification and Pricing for Electric Vehicle Aggregator in Joint Energy-Regulation Market," ArXiv: 2411.02089, submitted to IEEE Transactions on Smart Grid, **under review**. [pdf]

Conference

- **Manqi Xu**, Ye Guo and Qiuwei Wu, "Real-time Bidding and Dispatch Strategies for Electric Vehicle Aggregator in Joint Energy and Reserve Markets Considering EV User's Preference," 2024 IEEE 8th Conference on Energy Internet and Energy System Integration (EI2), Shenyang, China, **accepted**.
- Manling Hu, **Manqi Xu** and Dunnan Liu, "Two-Stage Stochastic Optimization for Low-Carbon Scheduling in a Combined Energy System," 2024 IEEE 8th Conference on Energy Internet and Energy System Integration (EI2), Shenyang, China, **accepted**.
- Wenjun Tang, Shan He, Yuming Zhao, **Manqi Xu** and Ye Guo "Optimal Bidding Strategies of Electric Vehicles Aggregators Participate in Energy, Frequency Regulation and Demand Response Market," 2023 IEEE 7th Conference on Energy Internet and Energy System Integration (EI2), Hangzhou, China. [pdf]
- Hanyang Lin, Jianguo Zhou, **Manqi Xu**, Wenli Wu, Ye Guo and Hongbin Sun, "A Review on Virtual Power Plants: Development Progress and Market Participation Mechanisms," 2023 IEEE 7th Conference on Energy Internet and Energy System Integration (EI2), Hangzhou, China. [pdf]

RESEARCH & PROJECTS

EVA online bidding and dispatch strategy in joint energy and regulation markets March 2024 – Present

- Introduced an EVA bidding model in joint markets aimed at minimizing the EVA's total operational cost embedded with EV flexibility quantification and pricing;
- Proposed a flexibility preference and price-based power dispatch protocol, which ensures the fairness and feasibility of power dispatch given the regulation signals issued every few seconds;
- Developed an online bidding problem using stochastic MPC technique, and online indexing of optimal decisions solved by power allocation problem offline using the parametric programming technique.

Participation of Virtual Power Plant in Various Electricity Markets Jun 2022 – Present

- Developed internal interest balancing and benefit allocation mechanism for VPP based on cooperative game theory;
- Modeled bidding strategy of VPP in various markets based on multi-parameter programming technique;
- Wrote a review of the existing Virtual Power Plants, market mechanisms and development path suggestions at home and abroad, which was accepted by IEEE EI2 2023.

Market Mechanisms, Planning and Dispatch Methods for Flexible Vehicles-to-Grid Apr 2022 – June 2024

- Wrote an in-depth review about market mechanism and pricing strategies for Electric Vehicle aggregators (EVA);
- Proposes an flexibility quantification embeded EVA-DSO distributed coordination strategy, and an ADMM-based algorithm is used to solve the coordination problem in a distributed manner and also protect the EV users' privacy;
- Designed an EV aggregator bidding and coordination framework to follow the regulation signals issued by the ISO, the paper was accepted by IEEE EI2 2023.

An interactive dispatching strategy for MEGs based on the three-level optimization Nov 2019 – Jun 2020

- Designed a framework of micro energy grid participating in multi-level bidding game with a utility energy grid;
- Proposed an improved ant colony optimization algorithm based on the adaptive adjustment of pheromone volatile factor and transfer probability.

PROFESSIONAL EXPERIENCE

Power System Transformation Analyst Intern Jun 2024 – Oct 2024

International Energy Agency (IEA), Renewable Integration and Secure Electricity team *Pairs, France*

- Wrote a report on the contribution of EV Aggregators and Virtual Power Plants to China's power system flexibility in 2030, including the system services, barriers, qualitative and quantitative contribution for each service;
- Evaluated the contribution of the recommendations and measures in the IEA's "market-based policy toolkit" and gaps to meet the flexibility needs;
- Collaborated on the report titled "Roles of markets in enabling power system flexibility". [pdf]

Research Intern Jan 2023 – Mar 2023

Microsoft Research Asia (MSRA), Visual Computing Group *Shanghai, China*

- Evaluated the ability of LLM to invoke graph mining algorithms within graph databases;
- Trained Machine Learning models (GNN/Transformer/ALSTM) to find related videos with similar embeddings;
- Optimized baseline encoder with BERT model with HNSW algorithm to match cold-start videos having similar titles.

Data Analysis Intern Apr 2022 – Dec 2022

China Southern Power Grid *Guangdong, China*

- Conducted comprehensive literature reviews of the electricity market, with a particular focus on demand response markets both domestically and internationally;
- Developed a DAN-NFN-based model for the prediction of the opening interval (with probability) and clearing price of the Guangdong Province Demand Response market;
- Collaborated on crafting the report titled " White Paper on the Large Scale Application and Development of Vehicle-to-grid " jointly published by CSG and the China Electricity Council.

VOLUNTEER & LEADERSHIP EXPERIENCE

THU Faculty-Student Cup Badminton Tournament Group Champion, Nov 2023

THU Freshman Cup Badminton Tournament Group Champion, Oct 2022

"Goldwind Cup" Energy Innovation Competition Leader | National Third Prize, Apr 2021

National College Students Competition in Energy Economics Leader | National Third Prize, Jun 2020

World Horticultural Exposition, 2019 Volunteer Leader, Aug 2019 – Oct 2019

NCEPU Young Volunteer Association Publicity Department Leader, Jun 2019 – Sep 2020