JINHAO LIANG

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RESEARCH INTERESTS

I am particularly interested in integrating generative modeling with optimization to address complex engineering and scientific challenges. I am currently developing algorithms to ensure that the outputs of diffusion and flow-based generative models satisfy constraints with provable guarantees, with the goal of enabling scalable and adaptive solutions in robotics, physical science, and power systems.

EDUCATION

University of Virginia (UVA) Sep. 2024 - Now
Ph.D. in Computer Science GPA: 3.77/4.00
Advisor: Prof. Ferdinando Fioretto

The Chinese University of Hong Kong, Shenzhen (CUHKSZ) Sep. 2022 - Jul. 2024
M.Phil in Computer and Information Engineering GPA: 3.90/4.00
Advisor: Prof. Chenye Wu

Xidian University (XDU) Sep. 2018 - Jun. 2022
B.E. in Software Engineering GPA: 3.70/4.00

PUBLICATIONS

Machine Learning Conference Publications

1. **Jinhao Liang**, Jacob K. Christopher, Sven Koenig and Ferdinando Fioretto, "Simultaneous Multi-Robot Motion Planning with Projected Diffusion Models." accepted by ***The 42nd International Conference on Machine Learning (ICML)***, 2025
2. **Jinhao Liang**, Jacob K. Christopher, Sven Koenig and Ferdinando Fioretto, "Multi-Agent Path Finding in Continuous Spaces with Projected Diffusion Models." accepted by ***The 6th International Workshop on Multi-Agent Path Finding, at AAAI***, 2025

Journal Articles

1. **Jinhao Liang**, Wenqian Jiang, Chenbei Lu and Chenye Wu, "Joint Chance-constrained Unit Commitment: Statistically Feasible Robust Optimization with Learning-to-Optimize Acceleration." accepted by ***IEEE Transactions on Power Systems***, 2024. (JCR Q1)
2. Chenbei Lu, **Jinhao Liang**, Nan Gu, Haoxiang Wang and Chenye Wu, "Manipulation-Proof Virtual Bidding Mechanism Design." accepted by ***IEEE Transactions on Energy Markets, Policy and Regulation***, 2023.
3. Chenbei Lu, **Jinhao Liang**, Wenqian Jiang, Jiaye Teng and Chenye Wu, "High-Resolution Probabilistic Load Forecasting: A Learning Ensemble Approach." accepted by ***Journal of the Franklin Institute***, 2023. (JCR Q1)

Power & Control Conference Publications

1. Chenbei Lu, **Jinhao Liang**, Hongyu Yi and Chenye Wu, "Cost-effective Closed-loop Bilevel Robust Optimization for Joint Chance-constrained Economic Dispatch." accepted by ***The 16th ACM International Conference on Future and Sustainable Energy Systems (e-Energy)***, 2025.

2. **Jinhao Liang**, Ferdinando Fioretto and Chenye Wu, "Robust Bidding Strategies in Local Energy Markets." accepted by ***2025 IEEE Power & Energy Society General Meeting (PESGM)***, 2025
3. **Jinhao Liang**, Chenbei Lu, Wenqian Jiang and Chenye Wu, "Few-shot Residential Load Forecasting Boosted by Learning to Ensemble." accepted by ***the 7th IEEE Conference on Energy Internet and Energy System Integration (EI^2)*** , 2023
4. Wenqian Jiang, **Jinhao Liang**, Chenbei Lu and Chenye Wu, "Robust Online EV Charging Scheduling with Statistical Feasibility." accepted by ***the 62nd IEEE Conference on Decision and Control (CDC)***, 2023
5. **Jinhao Liang**, Wenqian Jiang and Chenye Wu, "Effective Carbon Tax Learning via Cap and Trade." accepted by ***IEEE 5th International Electrical and Energy Conference (CIEEC)***, 2022

SELECTED RESEARCH EXPERIENCE

Multi-Robot Motion Planning with Projected Diffusion Models
Supervior: Prof. Ferdinando Fioretto Sep. 2024 - Dec. 2024

- Introduced a novel formulation of Multi-Robot Motion Planning (MRMP) in continuous spaces using diffusion models, enabling the simultaneous generation of trajectories for all agents in a single framework.
- Adapted projected diffusion models (PDM) for MAPF by embedding constraints directly into the diffusion process, ensuring that the generated solutions are feasible and collision-free.
- Developed an augmented Lagrangian approach to accelerate the projection process, making the method scalable and practical for real-world applications.

Joint Chance-constrained Unit Commitment with Statistical Feasibility
Supervior: Prof. Chenye Wu Oct. 2022 - Jun. 2023

- Extended the notion of statistical feasibility into unit commitment, a mixed-integer problem, and formulated the statistically feasible unit commitment.
- Developed sample-based uncertainty set construction algorithms, yielding less conservative solutions.
- Accelerated the solving process and designed the optimization kernel to boost its computational efficiency further.

An Ensemble Approach for Probabilistic Load Forecasting
Supervior: Prof. Chenye Wu Jun. 2022 - Jul. 2023

- Proposed the ensemble framework, which can capture the optimal nonlinear combination of different single models.
- Developed the clustering-based few-shot methods to augment the data if data is limited.
- Demonstrated the performance guarantee of ensemble framework and clustering-based few-shot methods.

ACADEMIC SERVICES

PC Member

- *IEEE Conference on Energy Internet and Energy System Integration (EI^2)*

Reviewer

- *IEEE Transactions on Power Systems*
- *Applied Energy*
- *IEEE Transactions on Energy Markets, Policy, and Regulation*
- *IET Generation, Transmission & Distribution*
- *Data Science and Management*
- *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*
- *AAAI Conference on Artificial Intelligence (AAAI)*
- *IEEE Power & Energy Society General Meeting (PESGM)*

SELECTED HONORS

WoMAPF student travel grants	Dec. 2024
AAAI Student Scholarship	Dec. 2024
Presidential Award for Outstanding Graduate Students (top 10 in CUHKSZ)	Nov. 2024
Provost Fellowship (top graduate students in UVA)	Sep. 2024
Modern Scientists Scholarship (top 12 in XDU)	Jan. 2022

SKILLS

Programming Languages and Frameworks
Python, Pytorch, MATLAB

Languages
Chinese: native; English: professional working proficiency