Enming Liang

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RESEARCH INTERESTS

Machine Learning for Constrained Optimization, with Applications in Mobility, Energy, and Climate.

EDUCATION

City University of Hong Kong — Hong Kong
Ph.D. | Department of Data Science — 2021/09 − 2024/10
Supervisor: Prof. Minghua Chen

Sun Yat-sen University — Guangzhou
B.Eng. | School of Intelligent Systems Engineering — 2016/09 − 2020/07
GPA: 91/100, **Rank**: 1/47

INTERN & VISITING EXPERIENCE

Cambridge University — Cambridge
Visiting Student | Advisor: Prof. Srinivasan Keshav — 2024/05 − 2024/06
- Resilience of European Transimission Grid under Extreme Weather

Microsoft Research Asia — Beijing
Research Intern | Advisor: Dr. Li Zhao & Dr. Lei Song — 2022/05 − 2022/09
- Data-Driven Optimization for Vehicle Routing Problem
- Multi-Agent Resource Optimization (MARO) platform

Huawei Noah's Ark Lab — Shenzhen
Research Intern | Advisor: Dr. Zhitang Chen — 2020/10 − 2021/04
- Collaborative Optimization for Large-scale 4G LTE Cell Networks
- Scenario-based Optimization for High-Dimension 5G RF Parameters

Didi Chuxing & SYSU Research Cooperation Program — Guangzhou
Research Assistant | Advisor: Prof. Renxin Zhong — 2018/11 − 2020/05
- A Multi-Agent Reinforcement Learning Approach for Online Vehicle Dispatching
- Dynamic Spatial-Temporal Pricing for Supply-demand Regulations of Ride-sourcing Market

Guangdong Key Laboratory of Intelligent Transportation Systems — Guangzhou
Research Assistant | Advisor: Prof. Renxin Zhong — 2018/04 − 2018/10
- The Calibration of First-Order Macroscopic Traffic Models Using MF-CEM

GRANTS & FUNDS

CCF-DiDi GAIA Collaborative Research Funds 2024 — Beijing
Co-PI | working with Dr. Zicheng Su — 2024/07 − 2025/07
- Optimal Subsidy Design for Ride-Sourcing Platform

CCF-DiDi GAIA Collaborative Research Funds 2023 — Beijing
Co-PI | working with Dr. Zicheng Su — 2023/07 − 2024/07
- Decision-Focused Learning for Ride-Sourcing Platform

Conference Publications

Chenghao Liu, **Enming Liang**, Minghua Chen. Characterizing ResNet's Universal Approximation Capability. In Proceedings of the Forty-first International Conference on Machine Learning (ICML). PMLR. 2024

Enming Liang, Minghua Chen. Generative Learning for Solving Non-Convex Problem with Multi-Valued Input-Solution Mapping. In Proceedings of the Twelfth International Conference on Learning Representations (ICLR). 2024

Yunping Huang, Nan Zheng, **Enming Liang**, Shu-Chien Hsu, Renxin Zhong. An Approximate Dynamic Programming Approach to Vehicle Dispatching and Relocation using Time-Dependent Travel Times. In 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC). IEEE. 2023

Enming Liang, Minghua Chen, Steven H. Low. Low Complexity Homeomorphic Projection to Ensure Neural-Network Solution Feasibility for Optimization over (Non-)Convex Set. In Proceedings of the Fortieth International Conference on Machine Learning (ICML). PMLR. 2023

Enming Liang, Zicheng Su, Chilin Fang, Renxin Zhong. OAM: an Option-Action Reinforcement Learning Framework for Universal Multi-Intersection Control. In Proceedings of the AAAI Conference on Artificial Intelligence (AAAI). 2022

Renxin Zhong, Kexin Wen, Chilin Fang, **Enming Liang**. Real-time Multi-Resource Jointed Scheduling of Container Terminals with Uncertainties using a Reinforcement Learning Approach. In 2022 13th Asian Control Conference (ASCC) (pp. 110-115). IEEE. 2022

Journal Publications

Enming Liang, Minghua Chen, Steven H. Low. Homeomorphic Projection to Ensure Neural-Network Solution Feasibility for Constrained Optimization. Journal of Machine Learning Research. 2024

Zicheng Su, Andy H.F. Chow, Chilin Fang, **Enming Liang**, Renxin Zhong. Hierarchical Control for Stochastic Network Traffic with Reinforcement Learning. Transportation Research Part B: Methodological, 167, 196-216. 2023.

Enming Liang, Kexin Wen, William H.K. Lam, Agachai Sumalee, Renxin Zhong. An Integrated Reinforcement Learning and Centralized Programming Approach for Online Taxi Dispatching. IEEE Transactions on Neural Networks and Learning Systems, 33(9), 4742-4756. 2021.

Andy H.F. Chow, Zicheng Su, **Enming Liang**, Renxin Zhong. Adaptive Signal Control for Bus Service Reliability with Connected Vehicle Technology via Reinforcement Learning. Transportation Research Part C: Emerging Technologies, 129, 103264. 2021.

Zicheng Su, Andy H.F. Chow, Nan Zheng, Yunping Huang, **Enming Liang**, Renxin Zhong. Neuro-Dynamic Programming for Optimal Control of Macroscopic Fundamental Diagram Systems. Transportation Research Part C: Emerging Technologies, 116, 102628. 2020.

Working Papers

Enming Liang and Minghua Chen. Efficient Bisection Projection to Ensure Neural-Network Solution Feasibility for Constrained Optimization over General Set. 2024.

Enming Liang, Minghua Chen, and Srinivasan Keshav. European Electricity Grids May Exhibit Heatwave-induced Capacity Bottlenecks. 2024.

Min Zhou, **Enming Liang**, Minghua Chen, and Steven Low. Partially Permutation-Invariant Neural Network for Solving Two-Stage Stochastic AC-OPF Problem. 2024.

TUTORIALS & ACTIVITIES

AI for Optimal Power Flow Tutorial Climate Change AI Summer School 2024

<u>Enming Liang</u>, Priya L. Donti, and Minghua Chen 2024/07 − 2024/08

COMPETITIONS

MeiTuan 1st Low-Altitude Economy Flight Management Challenge 2024
Silver Prize (1%)

ICAPS Dynamic Pickup and Delivery Problem Competition 2021
Silver Prize (0.2%)

KDD CUP: Learning to Dispatch and Reposition on a Mobility-on-Demand Platform 2020
Solo winner | Top 2 (0.1%) in Task 1 | Top 5 (0.2%) in Task 2

AWARDS & HONORS

Top Reviewer Award in NeurIPS 2024 2024

Excellence Award in *Star of Tomorrow Internship Program*, MSRA 2022

Research Tuition Scholarship at CityU 2022 & 2023

Outstanding Undergraduate Thesis at SYSU 2020

National Scholarship in China 2020