Lingjun Meng

Address: ACEX-3.23, Imperial College London, SW7 2AZ, London, United Kingdom
Email: l.meng23@imperial.ac.uk **Webpage:** https://lingjun-meng.github.io/

Education

Imperial College London (Business School) Sep. 2023 – Now
PhD in Operations Research (Fully funded by the Business School GTA Scholarship)
Advisors: *Prof. Wolfram Wiesemann*, *Prof. Ryan Cory-Wright*

Swiss Federal Institute of Technology in Lausanne (EPFL) Sep. 2021 – Aug. 2023
M. S. in Control Theory GPA: 5.51/6.0 (equivalent to UK distinction)
Award: EPFL Excellence Fellowship

Xi'an Jiaotong University (XJTU) Sep. 2016 – June 2020
B. E. in Energy Engineering GPA: 92.65/100 (Ranking: 2/18)

University of Minnesota (UMN) June 2018 – Aug. 2018
Summer Exchange GPA: 3.89/4.0

Research Interest

Methodologies: Machine learning, robust optimization, optimal transport, statistical learning, signal processing
Topics: Data-driven decision making under uncertainty, revenue management, production and operations management

Working Paper

L. Meng, R. Cory-Wright, and W. Wiesemann (2024). A Scalable Approximation Algorithm for Distributionally Robust Optimization.

Publication

L. Meng, J. Coldenhoff, P. Kendrick, T. Stojkovic, A. Harper, K. Ratmanski, M. Cernak. (2023). On real-time multi-stage speech enhancement systems". *ICASSP 2024* [website]

Teaching

Math and Statistics Foundation for Analytics (MSc Business Analytics) Imperial College London
Teaching Assistant 2024 Fall

Industrial Internship

Two-stage learning for real-time speech signal separation and enhancement Feb. 2023 – Aug. 2023
Research Intern, Full-time, Advisor: *Dr. Milos Cernak*
CTO office, Logitech Europe S.A., Switzerland

- Enhance the speech quality corrupted by additive noise and nonlinear distortions based on two-stage learning.
- Propose a lightweight two-stage network which consists of a Mel-scale magnitude masking model in the first stage and a complex spectrum mapping model in the second stage. The proposed two-stage network with optimal training scheme could achieve a similar performance to a four-times larger open-source model.

Patent & Copyright

[1] Performance analysis and design software for geothermal heat exchanger. Software Copyright. License: 2020SR0337174
[2] A Design Method of Non-disturbing Geothermal Heat Exchanger Considering Heat Exchange, Resistance and Economic Factors. Patent.

Skills

Theory: Optimization theory, applied probability, stochastic process, dynamic programming, numerical algorithms
Practical: Python, Julia, Matlab, C++, HPC, Tensorflow, Pytorch, Optimization Solvers, Machine Learning Packages

Research Project

Efficient approximation scheme for optimal-transport distributionally robust optimization Sep. 2023 – Now

Research Assistant, Advisor: *Prof. Wolfram Wiesemann, Prof. Ryan Cory-Wright*

Imperial College Business School, United Kingdom

- Design an efficient and tractable approximation scheme for optimal-transport DRO problems that leverages only two extreme solutions, the solution of nominal stochastic problem and high ambiguity problem.
- Provide a rigorous error bound for the approximation scheme and study the approach under various practical applications including portfolio selection, facility location and energy system operation.

Online bandit algorithms based on distributionally robust optimization Feb. 2022 – Oct. 2022

Research Assistant, Advisor: *Prof. Daniel Kuhn*

Risk Analytics and Optimization Chair, EPFL, Switzerland

- Develop bandit algorithms based on DRO for online decision-making under uncertainty. Reformulate the distributionally robust bandit algorithms to tractable convex program.
- Derive non-asymptotic regret upper bounds for the policies based on concentration theorems and mathematical analysis techniques, which give a theoretical convergence guarantee for the developed DRO bandit algorithms.

Bayesian active learning for robot learning July 2022 – Oct. 2022

Summer Research Intern, Contract, Advisor: *Prof. Aude Billard*

Learning Algorithms and Systems Laboratory, EPFL, Switzerland

- Learn a safety value function for robots from online user demonstrations using Gaussian process regression.
- Tackle the concept drift challenge through adaptive learning and uncertainty sampling, which significantly reduces the sample collection cost demonstrated through synthetic experiments.

Understanding test-time adaptation through synthetic simulation Sep. 2021 – Jan. 2022

Research Assistant, Advisor: *Prof. Alexandre Alahi*

Lab of Visual Intelligence for Transportation, EPFL, Switzerland [Project Repo]

- Implement several test-time adaptation methods (TTT, TTT++, TENT, SHOT) for improving the machine learning robustness to distribution shifts.
- Design synthetic experiments to control the domain shifts. Compare and analyze the mechanism of different methods under various domain shifts.

Simulation platform development for geothermal systems Nov. 2020 – June 2021

Research Assistant, Advisor: *Prof. Yaling He*

Lab of Energy Conversion and Storage, XJTU, China

- Propose a method that can predict the comprehensive performance of geothermal heat exchanger and thermal storage systems considering heat transfer, flow resistance, and economical cost.
- Develop a software platform to simulate the performance of geothermal systems.