MOLIN LIU

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EDUCATION

Shanghai Jiao Tong University (SJTU), Shanghai — Sept. 2021 - Mar. 2024

- Currently pursuing a *master's degree* in Industrial Engineering and Management.
- Studied *Production and Operations Analysis* (**A**), *Advanced Operations Research* (**A-**) and *Advanced Statistics* (**A-**).
- Total GPA of **3.82/4.00**, ranking **6/44 (Top 15%)**.

Centrale Supélec (CS) - Université Paris-Saclay, Paris — Aug. 2019 - June 2021

- Enrolled in the *Sino-French 4+4 Double Diploma Program* at CS.
- Studied *Optimization* (**A+**), *Machine Learning* (**A**) and *Economics of Innovation and Growth* (**A+**) .
- Fulfilled the program requirements and anticipated graduation with an *engineering degree* in 2024.

Shanghai Jiao Tong University (SJTU), Shanghai — Sept. 2016 - June 2021

- Member of *ZhiYuan Honors Program of Engineering*, received a *bachelor's degree* in Industrial Engineering.
- Studied *Mathematical Analysis (Honor, **A-**)*, *Physics (Honor, **A+**)* and *Linear Algebra* (**A**).
- Total GPA of **3.69/4.30**, ranking **71/469 (Top15%)**.

PUBLICATIONS

Accepted

- **Molin Liu**, Yulu Zhou, Siyang Wang, Chunming Zhang, Shichang Du, Lifeng Xi. Machine-fixture-pallet constrained flexible job shop intelligent scheduling (*in Chinese*). *Science China Technological Sciences*, 2023.
- Xiaoxiao Shen, Jun Lv, Shichang Du, Yafei Deng, **Molin Liu**, Yulu Zhou. Integrated optimization of electric vehicles charging location and allocation for valet charging service. *Flexible Services and Manufacturing Journal*, 2023.

In Process

- **Molin Liu**, Jun Lv, Shichang Du, Yafei Deng, Xiaoxiao Shen, Yulu Zhou. Multi-resource constrained flexible job shop scheduling problem with fixture-pallet combinatorial optimisation. *Computers & Industrial Engineering*, *minor revision*.

Working Paper

- Multi-objective optimization of flexible job shop scheduling problem with multi-AGV transportation constraints.

RESEARCH EXPERIENCES

Operations Research Internship at Alibaba Group — June 2023 - Sept. 2023

- Investigated classic and frontier research methods in the field of **price optimisation**, covering economic modelling, causal inference, integer programming and robust optimization.
- Proposed a novel methodology to handle with the **multi-threshold incentive allocation** problem targeting on take-away riders, in which an integer programming model with limited elasticity data was formulated and simplified.
- Attempted **robust optimization** with ellipsoidal uncertainty sets to address the uncertainty of predicted parameters.

Intelligent Production Scheduling Program — July 2021 - June 2023

- Cooperated with a leading domestic engine manufacturer to develop a set of **intelligent production scheduling algorithms** for the advanced planning and scheduling system in its *New Product Development Center*.
- Designed and realized: **pre-scheduling and order splitting** to meet resource constraints; **advanced static scheduling** suitable for highly flexible production scenarios; **dynamic scheduling** for various exceptional situations.
- Enhanced production efficiency through a 15% increase in machine utilization and a 10% reduction in order delay.

Flexible Job Shop Scheduling Problem (FJSP) with Fixture-pallet Constraints — June 2022 - Feb. 2023

- Formulated a mixed integer programming model to solve FJSP with multi-resource constraints, aiming to minimize makespan and find optimal fixture-pallet combination mode simultaneously.

- Proposed a **feasibility repair strategy** to address potential coupling conflicts between machines and fixtures and designed a **self-learning variable neighbourhood search policy** to further improve algorithm performance.
- Proved the effectiveness and efficiency of the proposed algorithms by cases derived from real production scenarios.

Operations Research Internship at Cardinal Operations Oct. 2022 - Jan. 2023

- Participated in **Shanghai Metro maintenance scheduling program** and analyzed existing algorithm framework.
- Developed a heuristic algorithm for **overhaul scheduling of entire metro network**, which incorporated factors such as contractor's maintenance capacity, minimum operational requirements for each line, and maintenance interval.
- Enabled rapid generation of optimal metro repair plans within minutes, replacing traditional manual planning modes.

Airline Crew Scheduling Problem Sept. 2021 - Oct. 2021

- Developed a mixed integer programming model, considering complex factors such as crew members' qualifications, crew member bases, flight assignments, flight duration, destinations, task dependencies, and other constraints.
- Utilized the *Gurobi solver* for modeling and optimization, and devised a heuristic algorithm based on **greedy and depth-first search**, demonstrating enhanced efficiency and accuracy through numerical experiments.
- Awarded the **Second Prize (Top 10%)** in the *18th "Huawei Cup" Graduate Mathematical Modeling Competition*.

Awards and Honors

- **Samsung Scholarship** (**14 award places**), Shanghai Jiao Tong University, 2022.
- **Postgraduate Academic Scholarship** (**First class**), Shanghai Jiao Tong University, 2022.
- **Second Prize** (**Top 10%**) in 18th China Graduate Mathematical Modeling Competition, 2021.
- **Scholarship of China Scholarship Council (CSC)**, Centrale Supélec, 2019-2021.
- **Zhiyuan Honors Scholarship** (**Top 10%**), Shanghai Jiao Tong University, Annually 2016-2020.

Skills and Interests

- **Programming**
  Skilled in *Python* and *Matlab*.
  Familiar with mathematical solvers such as *Gurobi*, *CPLEX* and *COPT*.
- **Language**
  English: IELTS 7.5.
  French: TFI B2.
  Chinese: Native language.
- **Interests**
  Calligraphy, Singing, Basketball.