MOLIN LIU

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EDUCATION

Shanghai Jiao Tong University (SJTU), Shanghai 2021.09 - Present

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

Centrale Supélec (CS), Paris 2019.08 - 2021.06

- Participated in the *Sino-French 4+4 Program* and went to CS as a **Double Diploma** student.
- Studied *Optimization* (**A+**), *Machine Learning* (**A**) and *Signal Processing* (**A**) .
- Successfully fulfilled the program requirements and anticipated graduation with an *engineering degree* in 2024.

Shanghai Jiao Tong University (SJTU), Shanghai 2016.09 - 2021.06

- Received a *bachelor's degree* in Industrial Engineering and Management.
- Member of *ZhiYuan Honors Program*, studied *Mathematical Analysis (Honor)* and *Physics (Honor)*.
- 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.

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, *under review*.
- 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, *under review*.

RESEARCH EXPERIENCES

Flexible Job Shop Scheduling Problem (FJSP) with Fixture-pallet Constraints 2022.06 - 2023.02

- 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** 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 2022.10 - 2023.01

- Participated in **Shanghai Metro Maintenance Scheduling Program**.
- 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.
- An optimal metro repair plan could be made within minutes, reducing the maintenance costs.

Intelligent Production Scheduling Program 2021.07 - 2023.06

- 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*.
- The algorithms 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.
- Workshop management efficiency was effectively improved and management costs were highly reduced.

Airline Crew Scheduling Problem 2021.09 - 2021.10

- 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* to perform modeling and optimization, and devised a heuristic algorithm based on **greedy and depth-first search**, whose efficiency and accuracy were validated through numerical experiments.
- Awarded the **Second Prize (Top 12.29%)** 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 12.29%**) in 18th China Graduate Mathematical Modeling Competition. 2021.
- **Scholarship of China Scholarship Council (CSC)**, Centrale Supélec. 2019-2021.
- **Zhiyuan Honors Scholarship** (**Top 5%**, Four times), Shanghai Jiao Tong University. 2017&2018&2019&2020.

Skills and Interests

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