

# Yunhao LIANG

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<https://yunhaoliang.github.io/>

## EDUCATION

**University of California, Berkeley (UCB) (College of Engineering)** CA, US

*M.E. in Industrial Engineering and Operations Research | GPA: 3.97/4.0* Aug 2024 - May 2025

- Relevant coursework: Machine Learning(A), Deep Learning(A), Applied Optimization(A), Stochastic Processes(A+), Supply Chains and Logistics Management(A)

**University of Pittsburgh (Swanson School of Engineering)** PA, US

*B.S. in Industrial Engineering, minor in Computer Science | GPA: 3.70/4.0* Aug 2022 - May 2024

- Relevant coursework: Supply Chain Analysis, Engineering Economics(A), Game Theory(A+), Probabilistic Method in Operation Research(A), Differential Equations(A-)

**Sichuan University (Sichuan University-Pittsburgh Institute)** Chengdu, China

*B.S. in Industrial Engineering | GPA: 3.43/4.0* Aug 2020 - May 2022

- Relevant Courses: Linear Algebra(A-), Human Factors Engineering(A-), Probability and Statistics

## PUBLICATIONS

- **Liang, Y.**, Zhang, P., Qu, Y., Lin, S., Shen, M. (2025). Graph Foundation Models: Bridging Language Model Paradigms and Graph Optimization. (Under review). <https://arxiv.org/abs/2509.24256>
- **Liang, Y.**, Qu, Y., Yang, J., Lin, S., Shen, M. Everyone Contributes! Incentivizing Strategic Cooperation in Multi-LLM Systems via Sequential Public Goods Games. Accepted at *AAMAS 2026*. Also accepted for presentation at *NeurIPS 2025 Workshop MLxOR* (non-archival). <http://arxiv.org/abs/2508.02076>
- Chen, S., Zhang, X., Wang, W., **Liang, Y.**, He, W., & Tan, Z. (2024). The Effect of Smart City Policies on City Innovation: A Quasi-natural Experiment from the Smart City Pilot Cities in China. *Sustainability*, 16(8007). <https://doi.org/10.3390/su16188007>
- **Liang, Y.** (2025). Research on Route Planning System of Logistics UAV Based on Supply Chain Technology. In Proceedings of Fourth International Conference on Computing and Communication Networks (ICCCN 2024). [https://doi.org/10.1007/978-981-96-6124-4\\_53](https://doi.org/10.1007/978-981-96-6124-4_53)
- Liu, Q., Guo, W., **Liang, Y.**, Yang, T., Mueller, M. Optimizing UAV path planning and wireless data transfer under battery and communication constraints. (Working Paper).

## RESEARCH EXPERIENCE

**Graph Foundation Models: Bridging Language Model Paradigms and Graph Optimization** HK, China

*Research Assistant, Supervisors: Prof. Max Shen & Prof. Shaochong Lin, HKU* Aug 2025 - Present

- Proposed the first graph foundation model (GFM) that transfers the pretrain-transfer paradigm of LLMs to graph optimization tasks.
- Designed a self-supervised random walk curriculum with hierarchical masked reconstruction to learn transferable structural priors from real road networks.
- Demonstrated that GFM can adapt to diverse optimization problems (shortest path, TSP variants, tour planning) without task-specific architectures, achieving competitive quality with significantly faster inference than classical solvers.

**Sequential Public Goods Game (SPGG) with Multi-LLM Agents Cooperation** HK, China

*Research Assistant, Supervisors: Prof. Max Shen & Prof. Shaochong Lin, HKU* May 2025 - Present

- Developed a multi-agent framework based on the Sequential Public Goods Game (SPGG) to study cooperation among LLM-based agents.
- Incorporated game-theoretic concepts (Subgame Perfect Nash Equilibrium, Belief Updating, Conditional Cooperation) to model and interpret emergent behaviors across different information regimes (full v.s. partial observability).

**Path Planning and Data Transmission for UAVs in Precision Agriculture** CA, US

*Research Assistant, Supervisor: Prof. Mark W. Mueller, UCB* Sep 2024 - May 2025

- Designed a two-level UAV path planning framework: for single-UAV scenarios, applied Christofides heuristic to efficiently approximate optimal sensor coverage; for multi-UAV scenarios, developed an agent-

- based swarm intelligence model with attraction–repulsion dynamics.
- Explored human-AI interaction frameworks by simulating UAV operators and intelligent autonomous systems, which is capable of handling both single- and multi-drone missions.
- Automated UAV operations and enhanced overall sensor-based framework efficiency.

### Image-to-Text AI System Based on Large Language Models | [Link](#)

CA, US

Independent Project

Feb 2025 - Mar 2025

- Built an AI pipeline that processes visual data (e.g., forms, handwritten notes) into structured text using multi-modal large language models.
- Explored prompt engineering and model fine-tuning for Pix2Text and Pix2Struct to improve accuracy and generalizability.
- Developed a Mini Program interface for real-world deployment (backend in progress).

### Smart City Policies and Urban Innovation

Chongqing, China

Research Assistant, Supervisor: Prof. Zhixiong Tan, Chongqing University

Aug 2023 - Aug 2024

- Investigated the impacts of China's Smart City Pilot Plan on urban innovation using a multi-period difference-in-differences (DID) model.
- Developed robust empirical models to analyze the effects of smart city policies on industrial upgrading and informatization in 296 prefecture-level cities from 2001 to 2021.
- Conducted extensive data curation and analysis of urban innovation indicators.

### Blood Donation Willingness Math Model and Supply Chain Optimization

PA, US

Research Assistant, Supervisor: Prof. Bo Zeng, University of Pittsburgh

Oct 2023 - Feb 2024

- Analyzed supplier-demand dynamics in blood transfusion systems within Kenyan hospitals.
- Created Discrete-Event Simulation (DES) models to prioritize blood transfusion allocation for high-urgency patients while maintaining balanced inventory levels.
- Coordinated with doctors from the University of Pittsburgh Medical Center (UPMC) to assess the real-world practicability of the proposed plan.

## PROFESSIONAL EXPERIENCE

### Improving Efficiency: Alstom's Subassembly Layout Overhaul

PA, US

Supply Chain Analyst Intern, Alstom Company

Jan 2024 - Apr 2024

- Partnered with Alstom to address inefficiencies in their West Mifflin facility's sub-assembly process for airport rail systems.
- Integrated Lean Six Sigma, 5S methodologies, and facility layout theory to improve workflow and space utilization, achieving a potential 49% improvement in layout efficiency.
- Employed systematic layout planning and visual management tools to enhance process efficiency and team communication.

### Sichuan Dazhou Iron & Steel Group Co., Ltd.

Dazhou, China

Data Analyst Intern, Technology Center

Jul 2022 - Aug 2022

- Participated in production data analysis, monitored key production indicators (e.g., steel output, energy consumption), assisted in optimizing production plans, and improved material flow efficiency.
- Analyzed 15 sets of data from the production workshop (including blast furnace operation, cold-rolled steel production, inventory turnover, etc.), data cleaning, feature extraction, and providing data support for production scheduling optimization.

## SKILLS

**Languages:** Chinese - native; English - fluent

**Technical Skills:** Java, Python, R, Gurobi, PyTorch, SolidWorks, Simio, MATLAB, SPSS, Stata 16, MySQL, LaTeX

## HONORS & COMMUNITY ENGAGEMENT

Fung Excellence Scholarship (USD \$15,000) | UCB

Aug 2024 - May 2025

Team Honors List and Dean's List | University of Pittsburgh

Aug 2022 - Apr 2024

Second Place | Swanson School of Engineering - Senior Project | University of Pittsburgh

Jan 2024 - Apr 2024

Engineering Student Association | Team member | University of Pittsburgh

Sept 2022 - Jul 2023

Student Association | Photographer | Sichuan University - Pittsburgh Institute

Sept 2020 - Jul 2021