Yufei Wang

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EDUCATION

Shanghai University of Finance and Economics, China *September 2021 - June 2025*
B.Eng. in **Data Science and Big Data Technology,** *Pilot Class of Interdisciplinary Sciences*

Overall GPA: **3.84/4.0** Average Score: **90.5/100** GPA of Core Courses: **3.91/4.0** Rank: **4/120**

- **CORE COURSES**

Mathematics:	Mathematical Analysis, Linear Algebra, Probability Theory, Mathematical Statistics, High Dimensional Data Analysis, Stochastic Processes
Optimization :	Dynamic Programming, Linear and Non-Linear Programming, Advanced Operations Research (Convex Optimization), Game Theory
Computer Science:	C++, Python, Data Structure, Machine Learning, Deep Learning, Algorithm Design and Analysis, Discrete Mathematics
Operations Management:	Operations Management

RESEARCH PROJECTS

Dynamic Spatial Matching with Delays (manuscript in preparation)
Advisor: ***Prof. Xingyu Bai*** (The Hong Kong Polytechnic University), ***Prof. Zihao Qu*** (The University of Massachusetts Amherst)
key words: heavy traffic, competitive analysis, online matching, spatial matching, car-pooling *July 2024 - present*
- In this research, we focus on dynamic spatial matching problems where requests arrive stochastically, such as in car-pooling platforms. The key issue explored is the trade-off between delaying matching decisions to increase market thickness and the associated increase in user waiting times. We propose four matching policies—Greedy, Radius, Batching, and Partition—which offer constant competitive ratios in comparison to the optimal offline solution. Our work provides insights into designing efficient matching policies that balance user satisfaction with market efficiency.
- Responsible for the proofs of the lower bound on optimal cost and upper bounds on matching policies and competitive analysis. Conduct numerical experiments on synthetic and real datasets for the proposed algorithms.

ML4MOC: A Benchmark for Optimizer Configuration using Machine Learning (working paper)
Advisor: ***Prof. Dongdong Ge*** (Shanghai Jiao Tong University), ***Prof. Qi Deng*** (Shanghai Jiao Tong University), ***Prof. Wenting Tu*** (Shanghai University of Finance and Economics), ***Dr. Qi Huangfu*** (Cardinal Operations)
key words: machine learning; mixed integer programming; configuration; benchmark *January 2024 - present*
- This paper presents a benchmark specifically designed for evaluating machine learning-based approaches to automatic configuration of MIP optimizers. Addressing limitations of existing methods, we provide diverse datasets and a dynamic feature set to enhance model predictive power. This benchmark aims to promote research and improve MIP solver performance for real-world applications.
- Responsible for the feature extraction procedure, including extraction and processing of static features from the original MILP problems and dynamic features from the COPT solving logs. Undertake part of the machine learning training tasks using Random Forest and Bayes optimization.

Optimal world design in video games | Research Assistant
Advisor: ***Prof. Christopher Thomas Ryan*** (University of British Columbia), ***Prof. Yifu Li*** (University of Science and Technology of China), ***Prof. Lifei Sheng*** (University of Houston-Clear Lake)
key words: video games; virtual worlds; decision fatigue; graph design; service design *Feb. 2024 - Apr. 2024*
- Spending time in virtual spaces is a growing part of modern life, especially in video games. This paper explores how to design virtual worlds that balance flexibility for different player time budgets with the need to avoid decision fatigue from complexity. We model this as a graph problem, propose a polynomial-time algorithm based on a "side-quest" tree structure for specific conditions. In general cases, our algorithm performs well compared to the optimal solution.
- Responsible for the integer programming modeling for optimal graph structure under general fatigue function scenarios, and comparing the gap between our algorithm and the optimal solution. Complete the code implementation of the proposed "side-quest" tree algorithm, summarize the experimental results, and propose conclusions.

COMPETITION EXPERIENCE

China Undergraduate Mathematical Contest in Modeling *September 2023 – September 2023*

Modelling and Coding, Shanghai First Prize

This competition's framework aims to optimize supermarket vegetable pricing, ordering, and assortment decisions. To address this, a multi-stage model is used, combining time series and correlation analysis with mixed-integer programming and MNL choice models. We begin by identifying product interdependencies, then simulate risk-cost benefits for ordering strategies using clustering and historical data, and finally integrate optimization techniques to maximize profitability through product selection.

Tsinghua "Jinjing Ledao" Economic Analysis Competition *October 2023 - December 2023*

Modelling and Coding, National Second Prize

The research framework explores AI's impact on the coal industry, focusing on supply, extraction, and utilization segments. It involves modeling and empirical analysis of these segments, a case study of the 'Huawei + Guoneng Shendong' partnership, and an assessment of policy effects on smart mining using a DID model. Industry-level impacts are evaluated with a multiple nonlinear regression model that incorporates LMDI decomposition and mediator variables to examine AI's influence on mortality rates, efficiency, and energy consumption.

WORK EXPERIENCE

RED, Shanghai Office *September 2024 - present*

Internship of Large Language Model Operations

- Responsible for Prompt Engineering for RED Company's large language model, establishing a multi-round critique mechanism to address challenges in self-awareness, casual chat, and creative scenarios during online multi-round conversations. Enhanced the model's capabilities while managing daily maintenance tasks, including extracting and annotating dialogue data, identifying anomalies, and resolving issues.
- Developed a tool platform with a user-friendly front-end interface, enabling automated data processing and online data management to streamline workflow and improve data processing efficiency.

Teaching Assistant of Shanghai University of Finance and Economics *September 2024 - present*

- Optimization Theory and Algorithms II
- High Dimensional Data Analysis

HONORS AND AWARDS

Scholarships

- Tai Long Star Scholarship *November 2024*
- Second Prize People's Scholarship from SUFE *September 2024*
- Third Prize People's Scholarship from SUFE *September 2022*

Contests

- China International College Students Innovation Competition, Shanghai Golden Prize *September 2024*
- Tsinghua Jinjing Ledao Economic Analysis Competition, National Second Prize *December 2023*
- China Undergraduate Mathematical Contest in Modeling, Shanghai First Prize *November 2023*
- China Undergraduate Mathematical Contest in Modeling, Shanghai Third Prize *November 2022*
- "Zhengda" Cup Market Research and Analysis Competition, Shanghai Second Prize *April 2022*

SKILLS

Languages & Software: Python, C++, MATLAB, R, Stata, SPSS
Others: Chinese zither, dance, vocal music, guitar