Tianxiao Dong

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Education

Sun Yat-sen University **Guangzhou, China**
Bachelor of Engineering in Intelligent Science and Technology *Sep. 2020–Jun. 2024*
GPA: 3.8/4.0
Relevant Courses:
- Probability and Statistics (90/100), Data Structure and Algorithm (90/100), Optimization Theory and Method (93/100), Operations Research (87/100)

Columbia University **New York, USA**
Master of Science in Operations Research *Sep. 2024–Present*
Program Status: First semester completed, ongoing.
First Semester GPA: 3.96
Relevant Courses:
- IEOR6613 Optimization I (A-), IEOR4004 Optimization Models and Methods (A)
- CSOR4231 Analysis of Algorithms I (A), IEOR4106 Stochastic Models (A+)

Publication

Dong, T., Effects of Different Generative Adversarial Networks on the Face Generation Task. *2023 IEEE International Conference on Image Processing and Computer Applications (ICIPCA)*. Aug. 2023. DOI: 10.1109/ICIPCA59209.2023.10257729

[Under Review] Optimal Social Welfare Allocations with Binary Valuations: Consistency of Strongly Pigou-Dalton Criteria. *The 34th International Joint Conference on Artificial Intelligence (IJCAI-25)*. Fourth Author.

Projects

Research on Algorithms in a Centralized Fair Allocation Problem **Guangzhou, China**
Supervised by Professor Kai Jin from Sun Yat-sen University *Nov. 2023–Jun. 2024*
Overview: The problem involves allocating m homogeneous items to n individuals. I modeled the envy in the group after allocation and defined the fairness as minimizing the total envy value within the group. The research explores efficient algorithms to solve this centralized fair allocation problem in detail.
Contributions:
- Developed a dynamic programming algorithm with a time complexity of $O(n^2m)$, and optimized it using the convex hull trick to achieve $O(nm)$ complexity, further reduced to $O(n^3)$ through specific problem properties.
- Proposed a greedy algorithm with $O(n)$ complexity, yielding correct results in large-scale random tests, also find a few counterexamples that caused the greedy algorithm to fail.
- Explored extensions of this centralized fair allocation model under other envy modeling variants, providing additional solutions and insights.
- Won the Outstanding Undergraduate Thesis Award of Sun Yat-sen University, 2024, which is awarded to the top 1% of undergraduate theses.

Field of Research: Algorithm Design, Operations Research

Skills & Interests

Programming Languages: C (4 yrs), C++ (4 yrs), Python (3 yrs), MATLAB (3 yrs)

Tools: LaTeX, Gurobi

Languages: English (Academic), Chinese (Native),

Research Interests: Combinatorics, Graph Theory, Discrete Mathematics, Mathematical Optimization, Algorithmic Game Theory, Computational Geometry, Theoretical Computer Science.

Other Interests: Pure Mathematics, Theoretical Physics.

Chinese Physics Olympiad Achievements:

- 123rd place (Second Prize) in the 36th Chinese Physics Olympiad, Beijing Division (2019).
- First Prize in the 31st Beijing High School Mechanics Competition Final (2018).
- First Prize in the 14th Beijing High School Applied Physics Competition Final (2019).