

HAO XIE

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I am a Ph.D. candidate specializing in algorithms, set to complete my program in August 2024 and receive my degree in November 2024. I am actively seeking a data science position, leveraging my extensive nine-year background in computer science. Throughout my studies, I have demonstrated a deep interest in data science, acquiring a strong knowledge base and proficient programming skills in this field. Additionally, my experience in programming competitions and research has honed my abilities as a collaborative team player. I am available for full-time employment starting in October 2024, with the flexibility to undertake internships from February to July 2024.

TOOLKITS: Programming (C&C++, Python); Probability and Statistics; Graph Theory, Algorithm Design and Analysis

EDUCATION

The University of Hong Kong **Sept. 2019 – present**
Ph.D Candidate in Computer Science, supervised by Dr. T.-H. Hubert Chan *Hong Kong SAR*

- **HKU Postgraduate Scholarship**

- Related Courses: *Convex Optimization, Advanced Topics in Visual Analytics, Data Management and Information Retrieval*

University of Electronic Science and Technology of China **Sept. 2015 – June 2019**
Bachelor of Engineering, major in Computer Science and Technology *Sichuan, China*

- **Outstanding Graduate**, 2019

- **China National Scholarship (Top 1%)**, 2018

- **Gold Medal** in ACM International Collegiate Programming Contest (ACM-ICPC) Asia Regional, 2018

- **Silver Medal** in CCF Collegiate Computer Systems & Programming Contest (CCF-CCSP), 2018

- Related Courses: *Probability and Mathematical Statistics* (98), *Mathematics and Mathematical Modeling* (91), *Discrete Mathematics* (98), *Computer Architecture* (94), *Computer Operating System* (93), *Data Structure and Algorithm* (85)

EXPERIENCE

The University of Hong Kong **Sept. 2020 – Aug. 2023**
Coach of HKU Teams for International Collegiate Programming Contest (ICPC) *Hong Kong SAR*

- Teams from HKU won 6 gold medals, 6 silver medals and 5 bronze medals in ICPC Asia Regionals.

- Two teams advanced to the ICPC World Finals, and they are the only two teams from HKU in the past ten years.

The University of Hong Kong **2019 – 2023**
Teaching Assistant for Undergraduate and Research Postgraduate Courses *Hong Kong SAR*

- Undergraduate: *Discrete Mathematics* (Fall 2019), *Introduction to Data Structures and Algorithms* (Fall 2020, Fall 2021)

- MPhil & Ph.D: *Probabilistic Method and Randomized Algorithms* (Spring 2023)

Gangxing Investment Co., Ltd. **June 2022 – Aug. 2022**
Quantitative Developer Intern | Programming (C++, Python) *Beijing, China*

Peking University **March 2022 – May 2022**
Visiting Research Student at Center on Frontiers of Computing Studies, invited by Dr. Shaofeng Jiang *Beijing, China*

RESEARCH PROJECTS

Finding Subgraphs with Maximum Total Density and Limited Overlap 📄 [doi:10.1145/3639410](https://doi.org/10.1145/3639410)
Data Science, Graph and Hypergraph, Linear Programming, Programming (C++) 🔗 [Source Code \(C++\)](#)

Joint work with Oana Balalau, Francesco Bonchi, T.-H. Hubert Chan, Francesco Gullo, Mauro Sozio

- ! Project involves devising an algorithm for finding subgraphs with maximum total density in hypergraph and limiting their overlaps under weighted Jaccard similarity coefficient.

- ✓ Mathematical proofs and experiments (C++) are included to show the efficiency of the algorithm.

- > Accepted to ACM Transactions on Knowledge Discovery from Data (TKDD)

Game-Theoretically Secure and Fair Protocols for the Ordinal Assignment Problem 📄 [Arxiv](#)
Game Theory, Assignment and Matching | *Joint work with T.-H. Hubert Chan, Ting Wen, Quan Xue*

- ! Project studies game-theoretically secure protocols for the classical ordinal assignment problem (aka matching with one-sided preference), under the setting that a trusted authority is absent and mutually untrusted players are responsible for generating the randomness themselves.

- ✓ We propose a maximin secure protocol that achieves fairness and stability (aka ex-post Pareto-efficiency), and show an impossibility result, stating that no maximin secure protocol can achieve both fairness and ordinal efficiency.

- > Accepted to International Conference on Applied Cryptography and Network Security (ACNS 2023)

Privacy Amplification by Iteration for ADMM with Convex Objective Functions 📄 [Arxiv](#)
Convex Optimization, Differential Privacy | *Joint work with T.-H. Hubert Chan, Mengshi Zhao*

- ! Project studies differential privacy amplification by iteration for Alternating Direction Method of Multipliers (ADMM). Privacy amplification by iteration aims to demonstrate how the noise in subsequent data points can enhance the privacy of previous data points in terms of differential privacy.

- ✓ We first show that focusing on one ADMM iteration does not satisfy the amplification property. Further, we prove that, by incorporating every two iterations with a newly proposed norm, where ADMM achieves non-expansion, we can achieve privacy amplification comparable to that of private gradient descent.

- > Accepted to Annual AAAI Conference on Artificial Intelligence (AAAI 2024)