Tian Bai Ph.D. | UESTC

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Summary

I received my Ph.D. degree in computer science from the University of Electronic Science and Technology of China (UESTC) in June 2024 under the supervision of Prof. Mingyu Xiao, the Vice Dean of the School of Computer Science and Engineering.
My Ph.D. dissertation is entitled "Investigations Concerning Parameterized and Exact Algorithms for the Feedback Set and Related Problems". My research interests include graph algorithms, approximation and parameterized algorithms, and algorithmic game theory.

Employment

UiB, Department of Informatics , *Postdoctoral Research Fellow* 2025.09 - Current

- Host: Prof. Fedor Fomin.
- Research Interests: Parameterized Algorithms, Prophet Inequality.

HKU, Department of Computer Science, *Postdoctoral Research Fellow* 2024.09 - 2025.08

- Host: Prof. Zhiyi Huang.
- Research Interests: Parameterized Algorithms, Contract Design, Prophet Inequality.

Education

UESTC, School of Computer Science and Engineering, Computer Science, *Ph.D.* 2024.06

- Advisor: Prof. Mingyu Xiao.
- Research Interests: Graph Algorithms, Parameterized Algorithms, Mechanism Design.

UESTC, BS Class (Math & Physics), Fundamental Sciences (Mathematics and Physics), *B.Sc* 2016.06

- Research Interests: Algebraic Coding Theory, Cryptography.

Research Publications

Journal Articles

[1] **Tian Bai**, Mingyu Xiao: A Parameterized Algorithm for Subset Feedback Vertex Set in Tournaments. Theoretical Computer Science 975: 114139 (2023).
Abstract: A novel dynamic programming algorithm for SFVS in tournaments utilizing a non-standard iterative compression technique and a polynomial-time algorithm for a special case of SFVS in tournaments.

[2] **Tian Bai**, Mingyu Xiao: Exact Algorithms for Restricted Subset Feedback Vertex Set in Chordal and Split Graphs. Theoretical Computer Science 984: 114326 (2024).
Abstract: A fast exact algorithm for R-SFVS in chordal graphs and split graphs based on the dividing&conquer method and branching techniques.

[3] **Tian Bai**, Mingyu Xiao: Computational Complexity of Feedback Vertex Set and Subset Feedback Set Problems: A Survey. Journal of computer research and development (2024).
Abstract: A survey of algorithm and complexity of FVS and SFVS in general and important graph classes.

[4] **Tian Bai**, Mingyu Xiao: Exact Algorithms for Maximum Independent Set Problem on Hypergraphs. SCIENTIA SINICA Informationis.
Abstract: Fast exact algorithms for MIS on Hypergraphs based on the dividing&conquer method and branching techniques. The first non-trivial exact algorithm for a price-collecting version of MIS on Hypergraphs, which breaks the 2^n-barrier.

[5] **Tian Bai**, Mingyu Xiao: Solving Subset Feedback Vertex Set in Chordal Graphs Faster than 2^k. Information and Computation (Under Submission)
Abstract: The Improving parameterized and exact algorithms for SFVS in Chordal Graphs and price-collecting.

[6] Mengfan Ma, **Tian Bai**, Mingyu Xiao, Bakh Khoussainov: Facility Location Games Beyond Single-Peakedness: the Entrance Fee Model. Mathematics of Operations Research (Under Submission)
Abstract: Upper and lower bounds about the (random) approximation ratios of the strategyproof mechanisms for a facility location game with an entrance fee.

Conference Proceedings

[1] **Tian Bai**, Mingyu Xiao: Breaking the Barrier 2^k for Subset Feedback Vertex Set in Chordal Graphs. 49th International Symposium on Mathematical Foundations of Computer Science (MFCS) 2024: 15:1-15:18.
Abstract: An improving algorithm breaking running time bound 2^k and some improving exact algorithms for SFVS in chordal graphs.

[2] Mengfan Ma, **Tian Bai**, Mingyu Xiao, Xin Chen: Facility Assignment with Fair Cost Sharing: Equilibrium and Mechanism Design. The 30th International Computing and Combinatorics Conference (COCOON) 2024: 203-215.
Abstract: The characterization of the strategyproof mechanisms for a facility location game with the entrance fee which shows that the approximation ratio of the strategyproof mechanisms is unbounded. I also designed unanimous and strategyproof mechanisms for this model.

[3] Mengfan Ma, Mingyu Xiao, **Tian Bai**, Bakh Khoussainov: Facility Location with Entrance Fees. Association for the Advancement of Artificial Intelligence (AAAI) 37(5), 5797-5804. 2023: 5797-5804.
Abstract: Almost tight bounds of the approximation ratios of a facility location game with an entrance fee.

[4] **Tian Bai**, Mingyu Xiao: Exact and Parameterized Algorithms for Restricted Subset Feedback Vertex Set in Chordal Graphs. Theory and Applications of Models of Computation - 17th Annual Conference (TAMC) 2022: 249-261.
Abstract: A dynamic programming algorithm for MIS problem parameterized by the minimum clique cover number and the fast parameterized and exact algorithms for R-SFVS in chordal graphs.

Talks

Presentation: CCF National Conference of TCS (NCTCS) 2023 2023.07
Computational Complexity of Feedback Vertex Set and Subset Feedback Set Problems: A Survey.

Presentation: TAMC 2022 2022.09
Exact and Parameterized Algorithms for Restricted Subset Feedback Vertex Set in Chordal Graphs.

Services and Professional Activities

Reviewer for Conferences

- ISAAC 2024
- MFCS 2024
- IPEC 2025
- COCOON 2025
- SOFSEM 2025
- WALCOM 2022 2024 2025.

Reviewer for Journals

- Theoretical Computer Science.
- Journal of Computer and System Sciences.
- Discrete Applied Mathematics.
- Frontiers of Computer Science.

Moderator for Workshops

- The 19th International Conference and Workshops on Algorithms and Computation (WALCOM), 2025.
- CCF National Conference of Computational Economics, 2024.
- Algorithms & Logic Workshop at UESTC, 2023.
- Algorithmic Game Theory and Computation Theory Forum at UESTC, 2022.
- The 2nd Theoretical Computer Science Outstanding PhD Students Forum (TCSPhd2021), 2021.

Teaching

Teaching Assistant for graduate students: Advanced Algorithm Analysis and Design 2022-2023
Teaching Assistant for undergraduate students: Frontiers of Theory of Computation 2022-2023
Teaching Assistant for undergraduate students: Frontiers of Theory of Computation 2021-2022
Teaching Assistant for undergraduate students: Advanced Algebra 2017-2018
Teaching Assistant for undergraduate students: Linear Algebra 2016-2017

Awards and Honors

Outstanding Teaching Assistant 2024
Global 69th/China 10th place in IEEE Global Extreme Programming Competition 12.0 2018
First prize in the National University Mathematics Competition 2014 & 2015