

EDUCATION

Zhejiang University <ul style="list-style-type: none">• Ph.d. Student in Control Science, GPA: 4.0/4• Supervisor: Jiming Chen, Peng Cheng.• Research Interest: Develop and analyze decision-making algorithms under an uncertain environment with theoretical guarantees, Online learning, Reinforcement Learning.	Hangzhou, China	Sep 2020 – Now
Zhejiang University <ul style="list-style-type: none">• B.Sc. in Automation (Control), GPA: 3.87/4	Hangzhou, China	Sep 2016 – June 2020

RESEARCH EXPERIENCE

Research

- **Stability of Weighted Majority Voting under Estimated Weights:** 2021 – 2022
In *Weighted Majority Voting* (WMV), the decision maker usually relies on an estimate called *trust* for assigning weight, while the decision accuracy is determined by the probabilities that sources provide accurate information (*trustworthiness*). We introduce and analyze two important properties of WMV: *stability of correctness* and *stability of optimality* to formally analyze the uncertainty brought by unbiased trust values. Stability of correctness measures the difference between the decision accuracy that the decision maker believes he can achieve and the accuracy he actually achieves. We prove stability of correctness absolutely holds for WMV. Stability of optimality measures the difference between the actual accuracy of decisions made using trust values, and those made using trustworthiness values. We find a relatively tight upper bound on the stability of optimality, meaning that, although using (unbiased) trust values is suboptimal compared to using the true trustworthiness values, the difference is small. We also provide an overview of how sensitive decision accuracy is to the changes in trust and trustworthiness.
- **Adaptive Hierarchical Decomposition for Range Query under Local Differential Privacy:**
In this work, we propose an Adaptive Hierarchical Decomposition (AHEAD) protocol to provide the privacy-preserving range query, which adaptively and dynamically controls the built tree structure, so that the injected noise is well controlled for maintaining high utility. Furthermore, we derive a guideline for properly choosing parameters for AHEAD so that the overall utility can be consistently competitive while satisfying LDP. Leveraging multiple real and synthetic datasets, we extensively show the effectiveness of AHEAD in both low and high-dimensional range query scenarios, as well as its advantages over the state-of-the-art methods.

Internship

- **Algorithm Intern:** Alibaba Local Service, Shanghai. Mar 2020 – Jan 2021
- **Visiting Student:** Singapore University of Technology and Design, Singapore. Jul 2019 – Sep 2019

THEORETICAL BACKGROUND

- Calculus, linear algebra, probability, linear control theory, basic convex optimization methods, basic online learning algorithms, basic reinforcement learning algorithms.

SELECTED HONOURS AND AWARDS

- Alibaba Annual Excellent Academic Intern (2021)
- Outstanding Graduate Student Award of Zhejiang University (2021)
- Outstanding Graduates Award of Zhejiang University (2020)
- National Encouragement scholarship (2017,2018,2019)
- Academic Scholarship of Zhejiang University (2017,2018,2019)

PUBLICATIONS

- **Shaojie Bai**, Dongxia Wang, Muller Tim, Jiming Chen, Peng Cheng. *Stability of Weighted Majority Voting under Estimated Weights*. [C]//In Proceedings of the 22st International Conference on Autonomous Agents and Multiagent Systems (AAMAS). 2023. (2023, June)
- Linkang Du, Zhikun Zhang, **Shaojie Bai**, Changchang Liu, Shouling Ji, Peng Cheng, Jiming Chen. *AHEAD: Adaptive Hierarchical Decomposition for Range Query under Local Differential Privacy*. In Proceedings of the 2021 ACM SIGSAC Conference on Computer and Communications Security (CCS) (pp. 1266-1288). (2021, November).
- Han Zheng, Yan Zhang, Lan Zhang, Hao Xia, **Shaojie Bai**, Guobin Shen, Xiangyang Li. *GraFin: An Applicable Graph-based Fingerprinting Approach for Robust Indoor Localization*. In 2021 IEEE 27th International Conference on Parallel and Distributed Systems (ICPADS) (pp. 747-754). (2021, December).