Jiale Chen

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EDUCATION

School of Electronics Engineering and Computer Science (EECS), Peking University, Beijing, China
Major in Computer Science and Technology   Sep 2018 – Jun 2022(expected)
Turing Class - an elite class founded by Prof. John E. Hopcroft; 60 students selected
Overall GPA: 3.89/4.0 (top 1%, 2/230)
National School of Development (NSD), Peking University, Beijing, China
Double-major in Economics   Sep 2020 – Jun 2022(expected)

RESEARCH INTERESTS

Theoretical Computer Science, especially topics at the intersection of Economics, Data Structures, and Algorithms

MANUSCRIPTS

Equal Affection or Random Selection: the Quality of Subjective Feedback from a Group Perspective
    Jiale Chen, Yuqing Kong, Yuxuan Lu
    submitted to The ACM Web Conference 2022 (***WWW 2022***).
    accepted as a poster by The Twenty-Second ACM Conference on Economics and Computation (***EC'21, Contributed Poster Session***).

MicroscopeSketch: Accurate Sliding Estimation Using AdaptiveZooming
    Zheng Zhong*, **Jiale Chen***, Shiqi Jiang, Yutong Hu, Tong Yang, Steve Uhlig
    submitted to 38th IEEE International Conference on Data Engineering (***ICDE 2022***).
    (*:Equal Contribution)

HoppingTimer: A Near-optimal Framework for Basic Estimation of Data Streams in Hopping Windows
    Kaicheng Yang, Jianyu Wu, Pu Yi, **Jiale Chen**, Cheng Chen, Tong Yang, Bin Cui
    submitted to 38th IEEE International Conference on Data Engineering (***ICDE 2022***).

RESEARCH EXPERIENCE

Fair exam-grading system under the Bradley-Terry model   July 2021-Present
Advisor: Prof. Jason Hartline   Northwestern University
- Designed an exam-grading system that included a task assignment that avoids cheating, and a grading rule that considers and estimates the difficulty of different questions
- Proved numerically that our grading rule outperforms the traditional averaging method from 15% to 20% under the Bradley-Terry model fitted by the real-world data
- Demonstrated theoretically the sample complexity for achieving a multiplicative error bound under the Bradley-Terry model

Stochastic k-server problem   July 2021-Present
Advisor: Prof. Jason Hartline   Northwestern University
- Showed several properties of the optimal policy of the infinite-horizon discounted-value k-server problem and designed an $(1 + \varepsilon)$-approximation algorithm
- Planning to consider the prior-independent setting of the problem

Locally proportional cake-cutting problem   Mar 2021-May 2021
Advisor: Prof. Ariel Procaccia   Harvard University
- Conducted literature review and analysis about the fair cake-cutting problem
- Showed an $O(n^2)$ upper bound of the local proportionality in the star graph and proved an $\Omega(n^2)$ lower bound in the discrete case, in which each agent is allowed to choose one piece
- Provided an efficient algorithm for a path with less than six points

Policy Aggregation via Nash Welfare   Feb 2021-Mar 2021
Advisor: Prof. Ariel Procaccia   Harvard University
- Disproved the assumed contraction mapping property of the dynamic programming and the assumed convergence of the policy iteration algorithm
- Proved that, if we view each state in the MDP as an agent, the local policy as the agent's action, and the discounted reward as the agent's utility function, there exists a mixed strategy equilibrium

Group-level informativeness evaluation through reported choices and predictions   Oct 2020-Feb 2021
Advisor: Assistant Prof. Yuqing Kong   Peking University

- Proposed the model for uninformative people and developed a new metric called f-variety to evaluate a group of people's informativeness in subjective questions, using self-reported choices and predictions of other people's choices
- Designed survey questions and showed that f-variety outperforms the baseline of an imbalance of choices in case studies
- Contributed a poster accepted by **EC'21** as well as a first-author paper submitted to **WWW 2022**

An algorithmic framework for estimating data streams in sliding window models Mar 2020-Feb 2021
Advisor: Prof. Tong Yang Peking University

- Developed an algorithmic framework, MicroscopeSketch, which can adapt fixed-window algorithms to sliding windows using the two-dimensional quantization and adaptive zooming method
- Constructed the first version of the algorithm, idea refinement, and the entire experimental work
- Performed extensive algorithm refinement and demonstrated that the developed algorithm outperforms the state-of-the-art algorithms in three tasks in both accuracy and speed
- Contributed a first-authored paper that was submitted to **ICDE 2022**

An algorithmic framework for tasks in hopping windows Mar 2020-Jun 2020
Advisor: Prof. Tong Yang Peking University

- Collaboratively developed a generic and near-optimal framework that can adapt fixed-window algorithms to time-based and count-based hopping windows for basic tasks, using hopping timestamps and local cleaning to clean outdated items
- Responsible for the theoretical validation of the algorithm's additional error as a framework and completed a comprehensive mathematical proof of the error bound brought by hopping timestamps and local cleaning, respectively
- Explained that our algorithm saves space at a small cost through my theoretical proof
- Contributed a paper as co-author.

TALKS **Equal Affection or Random Selection: the Quality of Subjective Feedback from a Group Perspective**
Peking University, CS Peer Talk Mar 2021
EC'21, Contributed Poster Session July 2021

AWARDS & SCHOLARSHIPS ICPC Regional Contest Gold Medal 2018, 2019
  4 times (rank 1, 1, 3, 8)
Pacemaker to Merit Student, Peking University 2019
  Top 2.5% in Peking University, awarded to one student in each class
POSCO Scholarship for Asian Universities 2019, 2020
  Top 2.5% in Peking University, awarded to at most one student in each class
Merit Student, Peking University 2020
  Top 5% in Peking University
May 4th Scholarship, Peking University 2020
  Highest award possible for students, more selective than National Scholarship.
  Top 0.5% in Peking University, Top 1/60 in Turing Class

STANDARD ENGLISH TESTS **TOEFL** 111 (29 + 30 + 24 + 28) Nov 07, 2020
GRE 326 (156 + 170) + 3.5 Oct 20, 2019

SKILLS **Programming**
C/C++, Python, LaTeX