ZUN LI

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EDUCATION

University of Michigan, Ann Arbor *Sept. 2018 - Now*
Ph.D. in Computer Science and Engineering
Advisor: Prof. Michael P. Wellman
Research: Computational Game Theory and Artificial Intelligence

Shanghai Jiao Tong University *Sept. 2014 - June 2018*
B.S.E. in Computer Science (IEEE Honored Class)
Advisor: Prof. Fan Wu & Prof. Zhenzhe Zheng
Research: Ad Auctions and Mechanism Design

INTERESTED AREAS

- Computational Economics, *e.g.*, computational game theory, auction theory, network economics
- Artificial Intelligence, *e.g.* multiagent systems, search, statistical learning, deep learning, reinforcement learning, evolutionary computation, probabilistic graphical models, Gaussian process
- Applications, *e.g.* computational advertising, recommender systems, game-playing AI, tradings

RESEARCH PAPERS

Conference Publications

[4] **Zun Li** (Oral), Michael P. Wellman,"Evolution Strategies for Approximate Solution of Bayesian Games", *In Proceedings of Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI)*, Virtual Online, 2021

[3] **Zun Li** (Oral), Michael P. Wellman,"Structure Learning for Approximate Solution of Many-Player Games", *In Proceedings of Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI)*, New York, 2020

[2] Steven Jecmen, Arunesh Sinha, **Zun Li**, Long Tran-Thanh, "Bounding Regret in Empirical Games", *In Proceedings of Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI)*, New York, 2020

[1] **Zun Li** (Oral), Zhenzhe Zheng, Fan Wu, Guihai Chen, "On Designing Optimal Data Purchasing Strategies for Online Ad Auctions", *In Proceedings of Seventeenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Stockholm, 2018

Journal Publications

[1] Qinya Li, **Zun Li**, Zhenzhe Zheng, Fan Wu, Shaojie Tang, Zhao Zhang, Guihai Chen, "Capitalize Your Data: Optimal Selling Mechanisms for IoT Data Exchange", *IEEE Transactions on Mobile Computing*, DOI: 10.1109/TMC.2021.3113387, 2021

Manuscripts

[2] **Zun Li**, Feiran Jia, Aditya Mate, Shahin Jabbari, Mithun Chakraborty, Milind Tambe, Yevgeniy Vorobeychik,"Solving Structured Hierarchical Games Using Differential Backward Induction", *In Submission*

[1] Feiran Jia, Aditya Mate, **Zun Li**, Shahin Jabbari, Mithun Chakraborty, Milind Tambe, Michael P. Wellman, Yevgeniy Vorobeychik,"A Game-Theoretic Approach for Hierarchical Policy-Making", *In Submission*

RESEARCH EXPERIENCE

Equilibrium Computation in Structured Black-Box Games *April. 2019 - Now*
Research Assistant at Strategic Reasoning Group, UMich *Advisor: Prof. Michael P. Wellman*

· Considered the problem of solving complex games given only black-box access to payoff values.

- For solving complete-information game, designed two model-based algorithms for two kinds of game structure: an unsupervised learning styled algorithm for games with symmetry, and a greedy search algorithm for games with sparsity
- Implemented two numerical algorithms to compute Nash equilibrium for these two types of succinct game models: L-BFGS-B for symmetric games, and homotopy method for graphical games
- For solving many-player games of incomplete information, formulated the problem of computing pure equilibria as a bi-level neural optimization problem, and designed a co-evolutionary algorithm implemented by natural evolution strategies to solve the problem
- Discovered that the method can recover known analytical solutions in economic games
- Implemented an incremental strategy generation framework to compute mixed equilibria, including fictitious play and replicator dynamics facilitated by a supervised-model-learning module
- Two first-authored paper published in AAAI'20 and AAAI'21 for oral presentation respectively

Data Acquisition in Ad Auctions *Aug. 2016 - Sept. 2017*
Researcher Assistant at Advanced Network Lab, SJTU *Advisor: Prof. Fan Wu*

- Formulated the optimal data acquisition problem in sponsored search auctions as a two-stage game
- Derived the conditions for the uniqueness and symmetry of the equilibria using convex optimization theory and payoff equivalence principle in auction theory
- Accepted by AAMAS'18 for oral presentation

WORKING EXPERIENCE

Buyside Analysis & Optimization in Google Display Ad Auction *Jun 2021 - Aug. 2021*
Software Engineer Intern, PhD, Google Inc. *Core Google Display Ad Team*

- Built and productionized a C++ pipeline using Google Flume framework and GoogleTest to generate advertisers' change history data in the order of 100GB
- Designed and implemented a complex analysis workflow linking GoogleSQL scripts and Python data analysis frameworks to analyze advertiser's exclusion behavior in Google Display Ad Auction
- Analyzed possible features including CTR, CVR, spend-ratio distributions and language match ratio and determined threshold values to explain advertisers' behavioral pattern
- Built a random forest classifier to classify high/low exclusion websites incorporating identified features

SELECTED PROJECT

Implementation of Consensus Protocols & Blockchain System *Oct. 2019 - Jan. 2020*
Course Project *Distributed Systems*

- Surveyed Paxos-family protocols including Paxos, Raft, ZooKeeper, Zyzzyva and XFT
- Implemented Paxos and Raft using Python and Go
- Designed and implemented a private blockchain system with DAG-based ledger and Byzantine consensus protocol

HONOR & REWARDS

Student Travel Scholarship *AAAI 2020, AAMAS 2018*
Meritorious Winners (Top 15% Worldwide), International Mathematical Contest in Modeling *2016*
First Class Prize (Top 2% Provincial Level), National Undergraduate Physics Contest *2015*

PROFESSIONAL SERVICES

Program Committee : AAAI'22, AAAI'21, AAMAS-GAIW'21

TEACHING EXPERIENCE

Graduate Student Instructor: EECS 592@UMich, AI Foundations, Fall'21

PROGRAMMING SKILLS

- Languages: Python, C++, Go, Java, LISP • Tools: Mathematica

COURSEWORK

EECS 545: Machine Learning	EECS 598: Reinforcement Learning	EECS 692: Advanced AI
EECS 586: Algorithms	EECS 591: Distributed Systems	CMPLXSYS 535: Networks
EECS 598: Quantum Computation	MATH 558: Nonlinear ODE	