Yuanyuan(Chloe) Yang

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Research Interests

Learning in auctions, Mechanism Design, Algorithmic Game Theory, Social and Economic Aspects of Machine Learning.

Education

Sept 2019–now **University of Washington, Seattle**,
PhD in Computer Science and Engineering,
Advisor: Jamie Morgenstern.

Sept 2018–Sept 2019 **Georgia Institute of Technology**,
PhD in Algorithm, Combinatorics and Optimization(ACO),
Advisor: Jamie Morgenstern.

Sept 2014–July 2018 **Shanghai Jiao Tong University**,
Mathematics-Finance Experimental Class,
Bachelor of Mathematics and Applied Mathematics.

Research Projects

Mar 2021-Now **Learning in repeated auctions with budget**, *with Okke Schrijvers, Jamie Morgenstern*.

- Analysed the fairness on the first price pacing equilibrium(FPPE) and second price pacing equilibrium(FPPE) for certain distributions
- Proposed a bidder learning strategy that may converge to the equilibrium for first price and second price auctions
- Proved BG-algorithm has a competitive ratio of 2 under arbitrary competition

June 2020-Now **Learning revenue-maximizing auction for asymmetric bidders**, *with Bhuvesh Kumar, Jamie Morgenstern*, under submission.

- Proposed a 2-stage mechanism for learning revenue maximizing auction for asymmetric bidders
- Under large market assumption, proved that for bounded distribution and unbounded Monotone Hazard Rate(MHR) distribution, our mechanism obtains $(1-\epsilon)$-optimal revenue.

Oct 2018-Oct.2019 **Rent-to-own Pricing for Machine Learning Models: Encouraging Exploration While Limiting Sunk Costs**, *with Sergei Vassilvitskii, Jamie Morgenstern*, manuscript.

- Modeled purchasing machine learning models as exploration of nodes in an acyclic graph
- Proposed a rent-to-own pricing scheme for selling machine learning models
- Proved that buyers obtained sublinear regret when applying simple no-regret strategies

Other Experiences

Sept 2020–Jan 2021 **Possible Racial Bias in Deep Learning - From A Dataset Perspective**, *[link]*, Deep Learning.

- Conducted data selection and cleaning of TED LIUM 3[link]
- Replicated the results of classic deep learning models(DeepSpeech([link])) on speech recognition for Caucasian people(TED LIUM 3[link]) and African Americans(CORAAL[link])
- Applied transfer learning with DeepSpeech2 pre-trained model
- Discovered prediction bias between Caucasian and African American (word error rate: 0.55 vs 0.37).

June 2016-Oct 2016 **Stock Market Prediction**, *advised by Xiaotie Deng*, SJTU.

- Analysed the interdependency of markets in different nations
- Used ensemble methods and ANNs to predict the direction(increase/decrease) of the stock index
- Achieved accuracy of 70% with a sensitivity of 0.8%

Jan 2012-Oct 2013 **Purchase intention of non-fraudulent counterfeit luxury goods**, *advised by Jie Chen*, SJTU.
- Conducted research on Experimental Economics
- Participated in the design and conduct of the economic experiments until 2017
- Analysed the collected data and tested the hypothesis "People tend to purchase big LOGO luxury goods if their jobs are obscure.(They have low chance to display themselves in public.)"

Achievements

2019 **Patent**, *ANT Financial*.
- Agent model for reinforcement learning

Aug 2018 **ACO Fellowship**, *Georgia Institute of Technology*.

July 2016 **Chun-Tsung Scholarship**, *Shanghai Jiao Tong University*.
- Hui-Chun Chin and Tsung-Dao Lee Chinese Undergraduate Research Endowment(CURE).
- Ranked (TOP 5%) among SJTU undergraduates.

Internship and Long-term Visitors

May 2019–July 2019 **Visiting Graduate Student**, Simons Institute, University of California, Berkeley.
- Visiting Graduate Student of the *Fairness Cluster program*
- Worked on strategic classification problem

Sept 2017–Mar 2018 **Visiting Undergraduate Student**, Harvard University.
- hosted by Yiling Chen
- Conducted research on information elicitation

Aug 2017–Sept 2017 **Algorithm Engineer Intern**, ANT Financial.
- Conducted research on reinforcement learning.
- Specified user behavior model as Input-Output Hidden Markov Model(IOHMM)

Service

2020,2021 **Theory Area Chair**, *Graduate Admissions Committee*, University of Washington CSE.

2017 **External Reviewer**, *WINE*.

Extra Curriculars

Mar 2019 **Statistics and Application**, *Teaching Assistant*.
Taught intro level probability and statistics to a batch of 40+ OR students.

Aug 2018 **Statistics and Application**, *Teaching Assistant*.
Taught intro level probability and statistics to a batch of 40+ OR students.

Mar 2017 **Discrete Mathematics**, *Teaching Assistant*.
Taught mathematical foundations of computer science to a batch of 60+ CS students.

Relevant Courses

Machine Learning, Deep Learning, Robustness in Machine Learning, Theory of Optimization and Continuous Algorithms, Computing for Social Good, Computability and Algorithms, Design and Analysis of Algorithms, Probabilistic Combinatorics

Skills

Computer Languages: Python, R, Matlab

Library: Pytorch, Lasagne, Scikit-learn, Numpy, Anaconda