

Shuo YANG

Department of Computer Science, University of Texas at Austin

Email: yangshuo_ut@utexas.edu

Website: yangshuo-ut.github.io

EDUCATION EXPERIENCE

Department of Computer Science, University of Texas, Austin

08/2018 – Now

- GPA: 4.0 Ph.D. student. Advisor: Sujay Sanghavi; Co-advisor: Inderjit S. Dhillon.

Department of Electrical Engineering, Tsinghua University, Beijing

08/2014 – 07/2018

- Major GPA: 92.35 Top 3 out of 140 in the department.

School of Economics and Management, Tsinghua University, Beijing

09/2015 – 07/2018

- Double Major in Economics.

Electrical and Computer Engineering, University of Texas, Austin

01/2017 – 05/2017

- GPA: 4.0 International Exchange Student Program.

RLAI Lab, University of Alberta

07/2017 – 09/2017

- Summer internship, supervised by Richard Sutton.

INDUSTRY EXPERIENCE

Amazon, Applied Scientist Intern, *Palo Alto, CA*

06/2021 – 11/2021

- Ranking model distillation for recommendation systems.

Google, Student Researcher, *Austin, TX (Remote)*

06/2020 – 09/2020

- Fast training of large-scale deep learning model (BERT).

Amazon, Applied Scientist Intern, *Berkeley, CA*

06/2019 – 09/2019

- Customer search query understanding and inline search suggestion.

RESEARCH INTEREST

My research interest lies in theoretical machine learning, optimization and sequential decision making under uncertainty. My research goal is to build machine learning algorithms that are theoretical sound and efficient in runtime/space/sample complexity.

RESEARCH EXPERIENCE

Misspecified Contextual Combinatorial Bandits

Shuo Yang, Rajat Sen, Sujay Sanghavi

- Studied the contextual combinatorial bandits problem when the underlying reward model is misspecified. Proposed two algorithms, with one requiring the knowledge of the misspecification level and the other not.
- Proved a lower bound and showed that the proposed algorithms achieve a matching regret upper bound.

Does Preprocessing Help Training Over-parameterized Neural Networks?

[NeurIPS 2021 (Poster)]

Zhao Song, **Shuo Yang**, Ruizhe Zhang (alphabetical order)

- Theoretically proved that by using the Half-Space-Reporting data structure, with 1) neural network weights preprocessed; or 2) training data preprocessed, the training time of an over-parameterized neural network can be sublinear in the number of neurons.

Linear Bandits Algorithm in Sublinear Time

Shuo Yang, Tongzheng Ren, Sanjay Shakkottai, Eric Price, Inderjit S. Dhillon, Sujay Sanghavi

- Extended existing solutions of one-time approximated Maximum Inner Product Search (MIPS) and provided

theoretical guarantee for a sequence of adaptive queries.

- Combined the new MIPS solution with linear UCB/TS algorithms and achieved per-step time complexity sublinear to the number of arms, with regret bound the same as the original algorithms.

Combinatorial Bandits with Inconsistent Preference

Shuo Yang, Tongzheng Ren, Inderjit S. Dhillon, Sujay Sanghavi

- Studied the online assortment optimization problem without assuming the users to have strict preference order for all available items.
- Proposed a weak preference assumption that covers commonly seen models including multinomial logit model/random utility model, etc.
- Proved the regret lower bound and proposed an algorithm that achieves a matching regret bound.

Consistent Sparse Quadratic Regression in Sub-quadratic Time and Space [NeurIPS 2019 (Poster)]

Shuo Yang*, Yanyao Shen*, Sujay Sanghavi

- Developed a sub-quadratic time gradient estimation method for quadratic model.
- Combining the sketching method with iterative hard threshold, obtained a provable linear convergence rate and consistent parameter estimation for solving quadratic regression.

GRADUATE COURSES

Fall, 2020

- Advanced Probability (Prof. Sanjay Shakkottai)
- Sublinear Algorithm (Prof. Eric Price)
- Wireless Networking (Prof. Lili Qiu)

Spring, 2020

- Markov Chains/Mixing Time (Prof. Joe Neeman)
- Statistical Machine Learning (Prof. Haris Vikalo)

Fall, 2019

- Online Learning (Prof. Sanjay Shakkottai)
- Randomized Algorithm (Prof. Eric Price)
- Natural Language Process (Prof. Greg Durrett)
- Deep Learning Seminar (Prof. Philipp Krahenbuhl)

Spring, 2019

- Large-Scale Optimization II (Prof. Constantine Caramanis)
- Algorithm: Techniques and Theory (Prof. Greg Plaxton)
- Theoretical Statistics (Prof. Purnamrita Sarkar)

Fall, 2018

- Large-Scale Optimization I (Prof. Sujay Sanghavi)
- Probability and Stochastic Process (Prof. Sanjay Shakkottai)