

YIFAN YANG

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EDUCATION

University of California, Santa Barbara (UCSB)
Ph.D. in Computer Science, advised by Prof. Zheng Zhang

Sep 2021-Present
GPA: 4.0/4.0

Huazhong University of Science and Technology (HUST)
B.E. in Electric and Information Engineering

Aug 2017-Jun 2021
GPA: 3.88/4.0

RESEARCH PROJECT

Online Gradient-based Sample Selection for Fair and Robust Training

Supervisor: Dr. Alec Koppel (JP Morgan AI Research), Prof. Zheng Zhang (UCSB)

- Developing the first gradient-based sample selection algorithm with a linear time complexity compared with the $\mathcal{O}(N \log N)$ sorting method
- Considering the fairness and robustness constraints when doing the online sample selection
- Employing the online sample selection algorithm on both Neural Network (NN) & Bayesian Neural Network (BNN) training
- Plan to analyze the selection algorithm from the local regret perspective

Online Bayesian Sampling based on Stein Variational Gradient Descent (SVGD)

Supervisor: Dr. Chang Liu (MSR, Asia), Prof. Zheng Zhang (UCSB)

- Developing the online SVGD based on the Following the leader history framework with an incremental updating rule.
- Analyzing the regret of online SVGD algorithm from the geometry of the Wasserstein space.
- Finishing the synthetic experiment to test the performance of the online SVGD algorithm.
- Propose an online training framework for the BNN based on the new online SVGD algorithm.

Adaptive Online Convex Optimization with Stochastic Constraints

Supervisor: Prof. Pan Zhou (HUST)

- Developing an algorithm considering the adaptive problem with stochastic constraints.
- Theoretical analysis of the bound for the regret and constraints by bringing in multi-objective drift analysis.
- By definition the loss function as a linear function, we give the first regret lower bound for the adaptive algorithm based on the following-the-leading-history framework.
- Simulate the performance of the algorithm with Python.

IoT Service Recommendation System by Contextual Multi-armed Bandits Algorithm

Supervisor: Prof. Pan Zhou (HUST)

- Propose the first tree-based quantile bandits algorithm to deal with both quantifiable and unquantifiable big data in the IoT network.
- Design a personalized service data retrieval system to solve the recommendation problem.
- Propose a novel quantile concentration inequity to analyze our algorithm and prove a sublinear regret bound for the algorithm.
- Collecting real-world services data and verifying our system on the data on the MATLAB platform.

PUBLICATIONS

Quantile context-aware social IoT service big data recommendation with D2D communication

Yifan Yang, Jie Xu, Zichuan Xu, Pan Zhou and Tie Qiu, *IEEE Internet Things J.*, vol. 7, no. 6, pp. 5533-5548.

Vflh: A Following-the-Leader-History Based Algorithm for Adaptive Online Convex Optimization with Stochastic Constraints

Yifan Yang, Lin Chen, Pan Zhou, Xiaofeng Ding Yang. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.4040704>

HONORS AND AWARDS

Academic Excellence Fellowship, UCSB	2021
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Outstanding Graduate, HUST	2021
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Learning Merit Scholarship, HUST	2017, 2018, 2019
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National Encouragement Scholarship of China	2018
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TEACHING EXPERIENCE

Teaching Assistant, Data Structures and Algorithms (CS 130A) at USSB	Winter 2021
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Reader, Data Structures and Algorithms (CS 130A) at USSB	Fall 2021
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TECHNICAL STRENGTHS

Programming Languages:	Python(PyTorch & TensorFlow), Matlab, C/C++, JAVA, SQL, \LaTeX
Languages:	Mandarin Chinese (native), English (proficient)