Zixin **Zhong**

PH. D.

Department of Mathematics, National University of Singapore

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Research Interests

Reinforcement learning, online machine learning (e.g., multi-armed bandit problem)

Work Experience

University of Alberta — *Edmonton, Canada*

POSTDOCTORAL FELLOW IN DEPARTMENT OF COMPUTER SCIENCE — *Jul. 2022 – Present*

- Supervisors: Prof. Csaba Szepesvári (also leading the Foundations team at DeepMind)

National University of Singapore (NUS) — *Singapore*

RESEARCH FELLOW IN DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING — *Jun. 2021 – Jul. 2022*

- Supervisors: Prof. Vincent Y. F. Tan and Prof. Wang Chi Cheung

Education

National University of Singapore (NUS) — *Singapore*

PH. D. IN DEPARTMENT OF MATHEMATICS (LOUIS CHEN HSIAO YUN BEST DISSERTATION PRIZE) — *Aug. 2017 – Oct. 2021*

- Supervisors: Prof. Vincent Y. F. Tan (main) and Prof. Wang Chi Cheung

Sun Yat-sen University (SYSU) — *Guangzhou, China*

B. S. IN SCHOOL OF MATHEMATICS (OUTSTANDING GRADUATE) — *Aug. 2013 – Jun. 2017*

- Thesis Advisor: Prof. Guocan Feng

University of California, Berkeley (UCB) — *Berkeley, U.S.A*

INTERNATIONAL STUDENT — *Aug. 2015 – Dec. 2015*

Sun Yat-sen University (SYSU) — *Guangzhou, China*

YAT-SEN SCHOOL (INCLUDING TOP 5% FROM SCHOOL OF MATHEMATICS) — *Nov. 2014 – Jun. 2017*

The Affiliated High School of South China Normal University — *Guangzhou, China*

MIDDLE SCHOOL — *Aug. 2007 – Jun. 2013*

Tutorials

Pure Exploration in Multi-Armed Bandits

Zixin Zhong, Vincent Y. F. Tan

International Joint Conference on Artificial Intelligence (IJCAI), Messe Wien, Vienna, Austria, July 2022

**: Corresponding author, **: equal contribution.*

Prepints

Optimal Clustering with Bandit Feedback
Junwen Yang, Zixin Zhong, and Vincent Y. F. Tan
Submitted, February 2022

Achieving the Pareto Frontier of Regret Minimization and Best Arm Identification in Multi-Armed Bandits
Zixin Zhong, Wang Chi Cheung, and Vincent Y. F. Tan
Submitted, January 2022

Journal Papers

Almost Optimal Variance-Constrained Best Arm Identification
Yunlong Hou, Vincent Y. F. Tan, and Zixin Zhong*
IEEE Transactions on Information Theory (IEEE TIT), 2022, doi: 10.1109/TIT.2022.3222231.

Fast Beam Alignment via Pure Exploration in Multi-armed Bandits (Journal Version)
Wei Yi, Zixin Zhong*, and Vincent Y. F. Tan
IEEE Transactions on Wireless Communications (IEEE TWC), 2022, doi: 10.1109/TWC.2022.3217131.

Thompson Sampling Algorithms for Cascading Bandits [Code]
Zixin Zhong, Wang Chi Cheung, and Vincent Y. F. Tan
Journal of Machine Learning Research (JMLR), Vol. 22, No. 218, Pages 1 – 66, September 2021

Conference Papers

Probably Anytime-Safe Stochastic Combinatorial Semi-Bandits
Yunlong Hou, Vincent Y. F. Tan, and Zixin Zhong*
International Conference on Machine Learning (ICML), Hawaii, U.S.A, July 2023

Stochastic Gradient Succeeds for Bandits
Jincheng Mei**, Zixin Zhong**, Bo Dai, Alekh Agarwal, Csaba Szepesvári, and Dale Schuurmans
International Conference on Machine Learning (ICML), Hawaii, U.S.A, July 2023

Fast Beam Alignment via Pure Exploration in Multi-armed Bandits
Yi Wei, Zixin Zhong, and Vincent Y. F. Tan
IEEE International Symposium on Information Theory (ISIT), Aalto, Finland, June 2022

Probabilistic Sequential Shrinking: A Best Arm Identification Algorithm for Stochastic Bandits with Corruptions [Code]
Zixin Zhong, Wang Chi Cheung, and Vincent Y. F. Tan
International Conference on Machine Learning (ICML), Virtual, July 2021

Best Arm Identification for Cascading Bandits in the Fixed Confidence Setting
Zixin Zhong, Wang Chi Cheung, and Vincent Y. F. Tan
International Conference on Machine Learning (ICML), Virtual, July 2020

A Thompson Sampling Algorithm for Cascading Bandits (oral presentation)
Wang Chi Cheung, Vincent Y. F. Tan, and Zixin Zhong
International Conference on Artificial Intelligence and Statistics (AISTATS), Naha, Okinawa, Japan, April 2019

Thesis

Performance Guarantees for Online Learning: Cascading Bandits and Adversarial Corruptions
Zixin Zhong
Ph.D. Thesis, Department of Mathematics, National University of Singapore, October 2021

Professional Activities

Conference Reviewer

2021-2023 Neural Information Processing Systems (NeurIPS) [Top reviewer in 2022]
2022-2023 International Conference on Machine Learning (ICML)
2022-2023 International Conference on Artificial Intelligence and Statistics (AISTATS)
2021-2023 International Conference on Learning Representations (ICLR)
2023 European Workshop on Reinforcement Learning (EWRL)

Journal Reviewer

IEEE Transactions on Information Theory (TIT)
IEEE Transactions on Signal Processing (TSP)
Transactions on Machine Learning Research (TMLR)

Presentation

Rising Stars: Academic Career Workshop in EECS — *University of Texas At Austin, U.S.A*
Oral and poster presentation of existing works — *Oct. 2022*

INFORMS 2021 Annual Meeting — *Virtual*
Oral presentation for the work appeared at ICML 2021 — *Oct. 2021*

The 22nd Conference of the International Federation of Operational Research Societies (IFORS) — *Virtual*
Oral presentation for the work appeared at ICML 2021 — *Aug. 2021*

The 3rd TBSI Workshop on Learning Theory (WOLT) — *Tsinghua-Berkeley Shenzhen institute, China*
Oral and poster presentation for the work appeared at ICML 2021 — *Jul. 2021*

Analytics for X, iORA, NUS — *National University of Singapore*
Oral presentation for the work appeared at ICML 2021 — *May. 2021*

Volunteer Activities

Nov. 2021 The 13th Asian Conference on Machine Learning (ACML) — *Singapore*
Nov. 2014 The 90th Anniversary of Sun Yat-Sen University — *Guangzhou, Guangdong*
Aug. 2014 Aid Education in Mountainous Area — *Heyuan, Guangdong*

Internship

AiDA Thchnologies Pte Ltd

Singapore

Data Scientist

Nov. 2020 – Mar. 2021

Reporting officers: Dr. Tan Geok Leng (CEO), Dr. Zha Wei

- **Insurance upsell/cross sell.** Developing a predictive analytics model for identifying candidates who have a propensity to buy insurance products from a bank's existing CASA customer base.
- **PIER71 Smart Port Challenge.** Developing a machine learning model to predict the Estimated Time of Arrival (ETA) for vessels plying between two known port pairs which achieves 1.34% percentage error. Analyzing the limitations of the model so developed.
- **Trading Floor Misconduct.** Developing a framework for text mining using Regular Expression to conduct experiments to lockdown parameters so that Risk Events may be detected with low False Alarm rates. The framework is now used as a standard tool in the company.

Honors & Awards

2023	NUS Louis Chen Hsiao Yun Best Dissertation Prize	*Singapore*
2022	Top reviewer for NeurIPS 2022	*New Orleans, U.S.A*
2022	Rising Star in EECS	*Austin, U.S.A*
2017 – 2021	NUS Research Scholarship	*Singapore*
2014	China National Scholarship	*China*
2014, 2015	SYSU First Class Scholarship	*Guangzhou, China*

Skills

Programming Python, Matlab, Latex, R, C/C++

Languages English, Mandarin, Cantonese