Zhuming Shi

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Citizenship: China

Research interests

Algorithmic Game Theory, Theoretical computer science

Education

2020 – Present **Peking University** – Beijing, China
Turing Class, School of Electronics Engineering and Computer Science

2019 – 2020 **Peking University** – Beijing, China
School of Electronics Engineering and Computer Science

2018 – 2019 **Peking University** – Beijing, China
College of Chemistry and Molecular Engineering

Honors and scholarships

2020 Excellent Scientific Research Award (Peking University)

2020 Third Prize as first author (Challenge Cup of Peking University)

2019 Second Class Scholarship of Peking University (Peking University)

2019 Sanhao student (Peking University)

2019 Second Prize (Contemporary Undergraduate Mathematical Contest in Modeling)

2017 Gold medal of 31st Chinese Chemical Olympiad (Southern University of Science and Technology, Chinese Chemical Society, China Association for Science and Technology)

Publications

2022 **[arXiv] Dynamic Budget Throttling in Repeated Second-Price Auctions**
Zhaohua Chen, Chang Wang, Qian Wang, Yuqi Pan, Zhuming Shi, Chuyue Tang, Zheng Cai, Yukun Ren, Zhihua Zhu, Xiaotie Deng.
arXiv.
https://arxiv.org/abs/2207.04690

2022 **[Under Review] Development and validation of a clinical support system for predicting incident frailty among community-dwelling older adults: A prospective cohort study**

Dr. Cuili Wang; Qinqin Liu, PhD; Liming Yang; Zhuming Shi; Jiaqi Yu; Huaxin Si, PhD; Yaru Jin, PhD; Yanhui Bian, PhD; Yanyan Li, PhD; Lili Ji, PhD; Xiaoxia Qiao, PhD; Wenyu Wang; Ming Zhang, Professor.

International Journal of Nursing Studies.

Current Unde Review

Research experience

June 2022 – Present **Regret Minimizing in Self-play Games**

Mentors: Yang Cai (Yale University).

We focus on lower bounds of regret in No-regret learning algorithms in self-play games. Our perpose is to achieve a near optimal lower bound of no-regret learning in games, for example, $O(1)$ lower bound. Numerical experiments are employed in our research. This research is still in process.

March 2022 – Present **Dynamic Budget Throttling in Repeated Second-Price Auctions**

Mentors: Xiaotie Deng (Peking University).

Throttling is one of the most popular budget control methods in today's online advertising markets. When a budget-constrained advertiser employs throttling, she can choose whether or not to participate in an auction after the advertising platform recommends a bid. Our work in this paper focuses on the dynamic budget throttling process in repeated second-price auctions from a theoretical view. We propose the OGD-CB algorithm, which involves simultaneous distribution learning and revenue optimization. In both settings, we demonstrate that this algorithm guarantees an $O(\sqrt{T \log T})$ regret with probability $1 - O(1/T)$ relative to the fluid adaptive throttling benchmark. The paper is avaliable on *arXiv* https://arxiv.org/abs/2207.04690

October 2020 – October 2021 **Challenge Cup 2021**

Mentors: Ming Zhang (Peking University).

We use an artificial neural network to predict old people's weakness in two years with biochemical indicators. And then we construct a website to make the model accessible to the world. The paper is under review of *International Journal of Nursing Studies.*

October 2019 – May 2020

Challenge Cup 2020

Mentors: Jiaying Liu (Peking University).

An artificial neural network was imployed in our work to map the IIM data to the distribution of the six major oxides on the moon. Finally we got new maps of lunar surface chemistry. The source code is open source on https://github.com/ShiZhuming/ChallengeCup

Teaching Assistantships

Fall 2022 **Teaching assistant, Introduction to Computer Systems (Peking University)**

Fall 2021 **Teaching assistant, Introduction to Computer Systems (Peking University)**

Fall 2019 **Teaching assistant, Cycling education (Peking University)**

Academic Service

August 2022 International Joint Conference on Theoretical Computer Science – Frontier of Algorithmic Wisdom, City University of Hong Kong, Hong Kong

Organizing Committee

August 2021 International Joint Conference On Theoretical Computer Science, Peking University, Beijing

Volunteer

Technical skills

Programming languages

Proficient in: Python, C++

Familiar with: HTML

Software

LaTeX, Git

Languages

English, Japanese

Other interests

Bike cycling

I have been captain of Peking University Venue Cycling Team for one term.

Photographing

My photos have been posted on website of Center on Frontiers of Computing Studies of Peking University.