Chung-En Tsai

MSc and PhD student, ETH Zürich

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Research Interests

Algorithms and complexity theories for learning, optimization, and related fields.

Education

09.2024 - Direct Doctorate Programme in Computer Science.
Eidgenössische Technische Hochschule Zürich (ETH Zürich).

09.2019 - 06.2023 Bachelor of Science in Computer Science and Information Engineering (CSIE).
National Taiwan University (NTU).

Experience

09.2021 – 07.2024 Research Assistant. *Laboratory of Learning Theory and Optimization Methods, NTU.*
- Advised by Prof. Yen-Huan Li.
- Working on online learning and optimization with logarithmic losses.

09.2022 – 06.2023 Research Assistant. *Mathematics Division, National Center for Theoretical Sciences.*
- Advised by Prof. Chun-Hsiung Hsia.
- Working on the Kuramoto model.

07.2022 – 08.2022 Summer Research Intern. *Institute of Information Science, Academia Sinica.*
- Advised by Prof. Kai-Min Chung.
- Studying circuit lower bounds and computational complexity theory.

Teaching

02.2024 – 06.2024 Teaching Assistant of CSIE5410: Optimization Algorithms. *Department of CSIE, NTU.*
Gave an 1.5-hour lecture on "Smooth Stochastic Convex Optimization."

09.2023 – 12.2023 Teaching Assistant of CSIE5062: Online Convex Optimization. *Department of CSIE, NTU.*

02.2023 – 06.2023 Teaching Assistant of CSIE5002: Prediction, Learning, and Games. *Department of CSIE, NTU.*

Service

07.2024 Reviewer. *The 38th Annu. Conf. Neural Information Processing Systems (NeurIPS 2024).*

06.2023 Volunteer. *The 2023 IEEE International Symposium on Information Theory (ISIT 2023).*

08.2021 – 07.2022 Minister of the Academic Department. *The 44th NTU CSIE Student Council.*

08.2020 – 07.2021 Member of the Academic Department. *The 43th NTU CSIE Student Council.*

Papers

[6] G.-R. Wang, C.-E. Tsai, H.-C. Cheng, and Y.-H. Li. Computing Augustin information via hybrid geodesically convex optimization. In *IEEE Int. Symp. Information Theory (ISIT)*, 2024.

[5] C.-E. Tsai, H.-C. Cheng, and Y.-H. Li. Fast minimization of expected logarithmic loss via stochastic dual averaging. In *Proc. Int. Conf. Artificial Intelligence and Statistics (AISTATS)*, 2024.

[4] C.-H. Hsia and C.-E. Tsai. On the synchronization analysis of a strong competition Kuramoto model. *arXiv preprint*, 2024.

[3] C.-E. Tsai, Y.-T. Lin, and Y.-H. Li. Data-dependent bounds for online portfolio selection without Lipschitzness and smoothness. In *Adv. Neural Information Processing Systems (NeurIPS)*, 2023.

[2] C.-E. Tsai, H.-C. Cheng, and Y.-H. Li. Online self-concordant and relatively smooth minimization, with applications to online portfolio selection and learning quantum states. In *Proc. 34th Int. Conf. Algorithmic Learning Theory (ALT)*, pages 1481–1483, 2023.

[1] C.-E. Tsai, H.-C. Cheng, and Y.-H. Li. Faster stochastic first-order method for maximum-likelihood quantum state tomography. In *Int. Conf. Quantum Information Processing (QIP)*, 2023.

Talks

08.2023 "Data-dependent bounds for online portfolio selection without Lipschitzness and smoothness." *Trends in AI Theory Seminar Series, MediaTek Research*.

02.2023 "Online self-concordant and relatively smooth minimization, with applications to online portfolio selection and learning quantum states." *ALT 2023*.

01.2023 "Learning quantum states with the log-loss." *Trends in AI Theory Seminar Series, MediaTek Research*.

06.2022 "Online portfolio selection and online entropic mirror descent." *Trends in AI Theory Seminar Series, MediaTek Research*.

Poster Presentations

05.2024 "Fast minimization of expected logarithmic loss via stochastic dual averaging." *AISTATS 2024*.

04.2024 "Data-dependent bounds for online portfolio selection without Lipschitzness and smoothness." *Workshop on Nonsmooth Optimization and Applications (NOPTA 2024)*.

01.2024 "Synchronization of Kuramoto model beyond sinusoidal interactions." *The 59th Annual Meeting of the Taiwanese Mathematical Society*.

01.2024 "Improved dimension and sample size scalability for maximum-likelihood state tomography and approximating PSD permanents." *QIP 2024*.

12.2023 "Data-dependent bounds for online portfolio selection without Lipschitzness and smoothness." *NeurIPS 2023*.

Awards

01.2024 Outstanding Paper Award. *The Mathematical Society of the Republic of China*.

06.2023 Appier's Research Award and Undergraduate Research Award. *Department of CSIE, NTU*.

12.2022 Dean's list. *Department of CSIE, NTU*.

06.2022 Undergraduate Research Award. *Department of CSIE, NTU*.

06.2020 Dean's list. *Department of CSIE, NTU*.

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