

Taisuke Yasuda

PhD Student, Carnegie Mellon University

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<https://taisukeyasuda.github.io>

Education

Carnegie Mellon University

Pittsburgh, PA

- Ph.D. in Computer Science, Aug 2020 – May 2024
- M.S. in Computer Science, Aug 2020 – Aug 2021
- Advisor: [David P. Woodruff](#)
- Thesis: *Algorithms for Matrix Approximation: Sketching, Sampling, and Sparse Optimization*

Carnegie Mellon University

Pittsburgh, PA

- M.S. in Mathematical Sciences, Aug 2017 – May 2019
- B.S. in Mathematical Sciences, Aug 2015 – May 2019
- Advisor: [Ian Tice](#)
- Thesis: *Asymptotic Stability of the Faraday Wave Problem*
- Additional Major in Computer Science

Employment

Voleon Group

New York City, NY

- Member of Research Staff, Jul 2024 – Present

Google Research

New York City, NY

- Research Intern, May 2023 – Aug 2023
- Student Researcher (part-time), Aug 2022 – May 2023
- Student Researcher (full-time), Apr 2022 – Aug 2023
- Worked on algorithms for efficient ML in the [Algorithms and Optimization Group](#)

Akuna Capital

Chicago, IL

- Junior Quantitative Trader, Aug 2019 – Sep 2020
- Worked on high frequency D1 machine learning trading strategies

Manuscripts

- [1] **Taisuke Yasuda**, Kyriakos Axiotis, Gang Fu, MohammadHossein Bateni, Vahab Mirrokni. SequentialAttention++ for Block Sparsification: Differentiable Pruning Meets Combinatorial Optimization. [arXiv:2402.17902](#) [cs.LG]
- [2] David P. Woodruff and **Taisuke Yasuda**. Nearly Linear Sparsification of ℓ_p Subspace Approximation.
- [3] Kyriakos Axiotis and **Taisuke Yasuda**. Performance of ℓ_1 Regularization for Sparse Convex Optimization. [arXiv:2307.07405](#) [cs.LG]

Research Publications

- [1] David P. Woodruff and **Taisuke Yasuda**. Coresets for Multiple ℓ_p Regression. In Proceedings of the 41st International Conference on Machine Learning (ICML), July 2024.

- [2] David P. Woodruff and **Taisuke Yasuda**. Reweighted Solutions for Weighted Low Rank Approximation. In Proceedings of the 41st International Conference on Machine Learning (ICML), July 2024.
- [3] Gregory Dexter, Petros Drineas, David P. Woodruff and **Taisuke Yasuda**. Sketching Algorithms for Sparse Dictionary Learning: PTAS and Turnstile Streaming. In Advances in Neural Information Processing Systems 36 (NeurIPS), December 2023. [arXiv:2310.19068](#) [cs.DS]
- [4] David P. Woodruff and **Taisuke Yasuda**. Sharper Bounds for ℓ_p Sensitivity Sampling. In Proceedings of the 40th International Conference on Machine Learning (ICML), July 2023. [arXiv:2306.00732](#) [cs.DS]
- [5] David P. Woodruff and **Taisuke Yasuda**. New Subset Selection Algorithms for Low Rank Approximation: Online and Offline. In Proceedings of the 55th Annual ACM Symposium on Theory of Computing (STOC), June 2023. [arXiv:2304.09217](#) [cs.DS]
- [6] **Taisuke Yasuda**, MohammadHossein Bateni, Lin Chen, Matthew Fahrbach, Gang Fu, and Vahab Mirrokni. Sequential Attention for Feature Selection. In Proceedings of the 11th International Conference on Learning Representations (ICLR), May 2023. [arXiv:2209.14881](#) [cs.LG]
- [7] David P. Woodruff and **Taisuke Yasuda**. Online Lewis Weight Sampling. In Proceedings of the 34th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), January 2023. [arXiv:2207.08268](#) [cs.DS]
- [8] David P. Woodruff and **Taisuke Yasuda**. High-Dimensional Geometric Streaming in Polynomial Space. In Proceedings of the 63rd Annual IEEE Symposium on Foundations of Computer Science (FOCS), November 2022. [arXiv:2204.03790](#) [cs.DS]
- [9] Cameron Musco, Christopher Musco, David P. Woodruff, and **Taisuke Yasuda**. Active Linear Regression for ℓ_p Norms and Beyond. In Proceedings of the 63rd Annual IEEE Symposium on Foundations of Computer Science (FOCS), November 2022. [arXiv:2111.04888](#) [cs.LG]
- [10] David P. Woodruff and **Taisuke Yasuda**. Improved Algorithms for Low Rank Approximation from Sparsity. In Proceedings of the 33rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), January 2022. [arXiv:2111.00668](#) [cs.DS]
- [11] Yi Li, David P. Woodruff, and **Taisuke Yasuda**. Exponentially Improved Dimensionality Reduction for ℓ_1 : Subspace Embeddings and Independence Testing. In Proceedings of the 34th Annual Conference on Computational Learning Theory (COLT), August 2021. [arXiv:2104.12946](#) [cs.DS]
- [12] Manuel Fernández V, David P. Woodruff, and **Taisuke Yasuda**. Graph Spanners in the Message-Passing Model. In Proceedings of the 11th Conference on Innovations in Theoretical Computer Science (ITCS), January 2020. [arXiv:1911.05991](#) [cs.DS]
- [13] David Altizio, Ian Tice, Xinyu Wu, and **Taisuke Yasuda**. The Nonlinear Stability Regime of the Viscous Faraday Wave Problem. In *Quart. Appl. Math.*, December 2019. [arXiv:1905.04747](#) [math.AP]
- [14] Manuel Fernández V, David P. Woodruff, and **Taisuke Yasuda**. The Query Complexity of Mastermind with ℓ_p Distances. In Proceedings of the 22nd International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), September 2019. [arXiv:1909.10668](#) [cs.DS]
- [15] Manuel Fernández V, David P. Woodruff, and **Taisuke Yasuda**. Tight Kernel Query Complexity of Kernel Ridge Regression and Kernel k -means Clustering. In Proceedings of the 36th International Conference on Machine Learning (ICML), June 2019. [arXiv:1905.06394](#) [cs.DS]

Teaching

Fall 2021	Algorithms for Big Data (15-859)	TA
Spring 2021	Probability and Computing (15-259)	TA
Spring 2019	Algorithms (15-451)	TA
Spring 2019	Concepts of Mathematics (21-127)	TA
Fall 2018	Linear Algebra (21-241)	TA
Spring 2018	Principles of Real Analysis II (21-356)	grader
Fall 2016	Putnam Seminar (21-295)	grader

Honors and Awards

Jan 2023		Finalist for Two Sigma PhD Fellowship (1 of 12 students from USA)
Jun 2022		Internal Nominee for MSR PhD Fellowship (1 of 4 students from CMU)
Mar 2018	Top 207	Putnam Mathematical Competition
Mar 2017	Top 500	Putnam Mathematical Competition
Feb 2017		Undergraduate Research Fellowship in Computational Neuroscience
Feb 2016	Top 3	TartanHacks 2016
Feb 2016	Winner	All University Orchestra Concerto Competition
May 2015		Carnegie Scholarship
Mar 2015	2nd Place	Pathfinder Scholarship in Mathematics
Dec 2014	Winner	A. W. Dreyfoos School of the Arts Concerto Competition
Dec 2014	Winner	Alhambra Community Orchestra Concerto Competition
Jan 2014	1st Chair Violin	Florida All-State Orchestra
Jan 2013	1st Chair Violin	Florida All-State Orchestra

Service

- 2022–2023 Carnegie Mellon University CSD PhD Admissions Committee
- Conference reviewing: ALENEX 2024, APPROX 2022, ESA 2020, ICALP (2022, 2023, 2024), ICML (2023, 2024), ITCS (2020, 2024), NeurIPS (2022, 2023), PODS (2022, 2023), RANDOM 2022, SODA (2020, 2023, 2024), STOC (2022, 2023, 2024)
- Journal reviewing: Machine Learning Journal

Talks and Presentations

- High-Dimensional Geometric Streaming in Polynomial Space
 - Guest Lecture at [UIUC CS 598 TH1](#), February 2023
- Active Linear Regression for ℓ_p Norms and Beyond
 - Google Research NYC, August 2022
- Exponentially Improved Dimension Reduction for ℓ_1 : Subspace Embeddings and Independence Testing
 - [Google Scalable Algorithms Workshop](#) (Poster), October 2021
 - [WALDO](#) (Poster), August 2021
 - CMU Student Seminar Series, July 2021
- Tight Kernel Query Complexity of Kernel Ridge Regression and Kernel k -means Clustering
 - CMU Meeting of the Minds (Poster), May 2019
- How It's Made: Lower Bounds for Randomized Algorithms
 - CMU Summer Math Seminar, July 2018