

# Taisuke Yasuda

## Curriculum Vitae

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## Education

### Carnegie Mellon University

Pittsburgh, PA

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

### 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

### 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 in the [Algorithms and Optimization Group](#)

### Akuna Capital

Chicago, IL

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

## Manuscripts

- [1] Kyriakos Axiotis and **Taisuke Yasuda**. Performance of  $\ell_1$  Regularization for Sparse Convex Optimization. [arXiv:2307.07405](#) [cs.LG]

## Research Publications

- [1] 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]
- [2] David P. Woodruff and **Taisuke Yasuda**. Sharper Bounds for  $\ell_p$  Sensitivity Sampling. In *Proceedings of the 40th International Conference on Machine Learning (ICML)*, July 2023. [arXiv:2306.00732](#) [cs.DS]
- [3] 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]

- [4] **Taisuke Yasuda**, MohammadHossein Bateni, Lin Chen, Matthew Fahrbach, Thomas 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]
- [5] 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]
- [6] David P. Woodruff and **Taisuke Yasuda**. High-Dimensional Geometric Streaming in Polynomial Space. To appear in Proceedings of the 63rd Annual IEEE Symposium on Foundations of Computer Science (FOCS), November 2022. [arXiv:2204.03790](#) [cs.DS]
- [7] Cameron Musco, Christopher Musco, David P. Woodruff, and **Taisuke Yasuda**. Active Linear Regression for  $\ell_p$  Norms and Beyond. To appear in Proceedings of the 63rd Annual IEEE Symposium on Foundations of Computer Science (FOCS), November 2022. [arXiv:2111.04888](#) [cs.LG]
- [8] 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]
- [9] Yi Li, David P. Woodruff, and **Taisuke Yasuda**. Exponentially Improved Dimensionality Reduction for  $\ell_1$ : Subspace Embeddings and Independence Testing. In Proceedings of the 34th Annual Conference on Computational Learning Theory (COLT), August 2021. [arXiv:2104.12946](#) [cs.DS]
- [10] 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]
- [11] 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]
- [12] Manuel Fernández V, David P. Woodruff, and **Taisuke Yasuda**. The Query Complexity of Mastermind with  $\ell_p$  Distances. In Proceedings of the 22nd International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), September 2019. [arXiv:1909.10668](#) [cs.DS]
- [13] 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

## Service

- 2022–2023 Carnegie Mellon University CSD PhD Admissions Committee
- Conference reviewing: ALENEX 2024, APPROX 2022, ESA 2020, IICALP (2022, 2023), ICML 2023, ITCS (2020, 2024), NeurIPS (2022, 2023), PODS (2022, 2023), RANDOM 2022, SODA (2020, 2023, 2024), STOC (2022, 2023)
- 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  $\ell_p$  Norms and Beyond
  - Google Research NYC, August 2022
- Exponentially Improved Dimension Reduction for  $\ell_1$ : 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