# 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.

[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

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|---|---|---|
| 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

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| 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, ICML 2023, NeurIPS (2022, 2023), APPROX 2022, RANDOM 2022, ICALP (2022, 2023), STOC (2022, 2023), PODS (2022, 2023), SODA (2020, 2023, 2024), ITCS 2020, ESA 2020
- 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