Junze Yin

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EDUCATION

Rice University   Houston, TX

    Ph.D. in Computer Science   Expected May 2030

Boston University (Cumulative GPA: 3.74/4.00), *Cum Laude*   Boston, MA

    M.A. in Mathematics **(major GPA: 3.85/4.00)**   May 2024
      – Thesis: Efficiently Approximate the Attention Computation Problem Through the Softmax Regression [(Link)](#)

    B.A. in Mathematics **(major GPA: 3.76/4.00)**   May 2024
      – Graduate with honor
      – Thesis: Juliabulb, Mandelbulb, and Logisticbulb [(Link)](#)

    B.A. in Philosophy and Religion **(major GPA: 3.73/4.00)**   May 2024

RESEARCH INTERESTS

- Numerical Linear Algebra, Theoretical Machine Learning, Large Language Models, and Robust Statistics

SELECTED RESEARCH EXPERIENCES

Mentor: Professor Mark Kon   Boston University, Boston, MA

- **Research Assistant** for the **Cancer Diagnostic Meta-Learning** project   October 2023 - May 2024
  – Funded by Professor Mark Kon and Professor Julio Castrillon at Boston University.
  – Researching the existing literature for meta-learning and feature extraction; finding the optimized parameters and techniques to train cancer diagnostic machines through using meta-learning.

Mentor: Professor Emma Previato   Boston University, Boston, MA

- **Student Research Award** for **Factorization of Multivariate Polynomial**   June - August 2022
  – Funded by the Undergraduate Research Opportunities Program (UROP) at Boston University.
  – Studied the influence of quantum computers on public-key cryptography; analyzed the reducibility of multivariate polynomials and factored the reducible multivariate polynomials.

- **Student Research Award** for **Fractal Analysis of the Urbanization Development**   June - August 2021
  – Funded by UROP at Boston University.
  – Introduced the concept of a dynamical fractal—a continuously and irregularly changing fractal—to study real-world phenomena like urbanization.

PUBLICATIONS

1. Haochen Zhang, Tianyi Zhang, **Junze Yin**, Oren Gal, Anshumali Shrivastava, Vladimir Braverman. "CoVE: Compressed Vocabulary Expansion Makes Better LLM-based Recommender Systems." In the 63rd Annual Meeting of the Association for Computational Linguistics (ACL 2025 Findings). [(Paper Link)](#)

   Author names in alphabetical order:

2. Yuzhou Gu, Zhao Song, and **Junze Yin**. "Binary Hypothesis Testing for Softmax Models and Leverage Score Models." In the Forty-Second International Conference on Machine Learning (ICML 2025). [(Paper Link)](#)

3. Zhao Song, Chongxi Wang, Guangyi Xu, and **Junze Yin**. "The expressibility of polynomial based attention scheme." In the 31st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2025). (Paper Link)

4. Jiehao Liang, Zhao Song, Zhaozhuo Xu, **Junze Yin**, and Danyang Zhuo. "Dynamic maintenance of kernel density estimation data structure: From practice to theory." In the 41st Conference on Uncertainty in Artificial Intelligence (UAI 2025). (Paper Link)

5. Yeqi Gao, Zhao Song, Weixin Wang, and **Junze Yin**. "A fast optimization view: reformulating single layer attention in LLM based on tensor and svm trick, and solving it in matrix multiplication time." In the 41st Conference on Uncertainty in Artificial Intelligence (UAI 2025). (Paper Link)

6. Zhao Song, Weixin Wang, Chenbo Yin, **Junze Yin**. "Fast and efficient matching algorithm with deadline instances." In the Conference on Parsimony and Learning (CPAL 2025). (Paper Link)

7. Zhao Song, Mingquan Ye, **Junze Yin**, Lichen Zhang. "Efficient alternating minimization with applications to weighted low rank approximation." In the Twelfth International Conference on Learning Representations (ICLR 2025). (Paper Link)

8. Yeqi Gao, Zhao Song, **Junze Yin**. "An iterative algorithm for rescaled hyperbolic functions regression." In the 28th International Conference on Artificial Intelligence and Statistics (AISTATS 2025). (Paper Link)

9. Zhao Song, **Junze Yin**, Ruizhe Zhang. "Revisiting quantum algorithms for linear regressions: quadratic speedups without data-dependent parameters." In the 28th Quantum Information Processing Conference (QIP 2025). (Paper Link)

10. Zhao Song, **Junze Yin**, Lichen Zhang, and Ruizhe Zhang. "Fast dynamic sampling for determinantal point processes." In the 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024). (Paper Link)

11. Zhao Song, **Junze Yin**, and Lichen Zhang. "Solving attention kernel regression problem via pre-conditioner." In the 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024). (Paper Link)

12. Yuzhou Gu, Zhao Song, **Junze Yin**, and Lichen Zhang. "Low rank matrix completion via robust alternating minimization in nearly linear time." In the Twelfth International Conference on Learning Representations (ICLR 2024). (Paper Link)

13. **Junze Yin**. "Dynamical fractal: Theory and case study." Chaos, Solitons & Fractals 176 (2023): 114190. (Paper Link)

14. Zhao Song, Mingquan Ye, **Junze Yin**, and Lichen Zhang. "A nearly-optimal bound for fast regression with ℓ_∞ guarantee." In the Fortieth International Conference on Machine Learning (ICML 2023), pp. 32463-32482. PMLR, 2023. (Paper Link)

Theses:

1. **Junze Yin**. "Efficiently approximate the attention computation problem through the softmax regression." Master's Thesis. Boston University (2024). (Paper Link)

2. **Junze Yin**. "Juliabulb, mandelbulb, and logisticbulb." Undergraduate Honor Thesis. Boston University (2022). (Paper Link)

PRESENTATIONS

Oral presentations:

1. **Junze Yin**. "Fractal Analysis of the Urbanization Development in Boston: 2000-2020." Joint Mathematics Meetings 2022. AMS Special Session on Geometry in the Mathematics of Data Science. American Mathematical Society. Seattle, WA. 6-9 Apr. 2022.

2. **Junze Yin**. "Fractal Dimension as an Indicator of Urbanization" - 2021. Virtual MAA MathFest 2021. MAA Student Paper Sessions. Mathematical Association of America. Washington, DC. 2021. 15-16. https://www.maa.org/sites/default/files/pdf/mathfest/2021/StudentAbstractBook2021B.pdf

Poster presentations:

1. Yuzhou Gu, Zhao Song, **Junze Yin**, and Lichen Zhang. "Low rank matrix completion via robust alternating minimization in nearly linear time." In the Twelfth International Conference on Learning Representations (ICLR 2024). Messe Wien Exhibition and Congress Center. Vienna, Austria. May 7th, 2024 to May 11th, 2024. Poster presentation.

2. Zhao Song, **Junze Yin**, Lichen Zhang, and Ruizhe Zhang. "Fast dynamic sampling for determinantal point processes." In the 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024). Palacio de Congresos de Valencia. Valencia, Spain. Poster presentation.

3. Zhao Song, **Junze Yin**, and Lichen Zhang. "Solving attention kernel regression problem via pre-conditioner." In the 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024). Palacio de Congresos de Valencia. Valencia, Spain. Poster presentation.

4. Zhao Song, Mingquan Ye, **Junze Yin**, and Lichen Zhang. "A Nearly-Optimal Bound for Fast Regression with ℓ_∞ Guarantee." Fortieth International Conference on Machine Learning. Hawaii Convention Center. Honolulu, HI. 26 Jul. 2023. Poster presentation.

5. **Junze Yin**. "Solving the Multivariate Polynomial with More Than Two Key Systems Over Finite Fields." The 25th Annual Undergraduate Research Symposium. Boston University. Boston, MA. 21 Oct. 2022. Poster presentation.

6. **Junze Yin**. "Fractal Analysis of the Urbanization Development in Boston: 2000-2020." The 24th Annual Undergraduate Research Symposium. Boston University. Boston, MA. 22 Oct. 2021. Poster presentation.

Reviewer Experiences

- Conferences: Reviewer at **NeurIPS 2025** (review 6 papers), **IJCAI 2025** (review 1 paper), **COLM 2025** (review 2 papers), **KDD 2025** (review 5 papers), **AISTATS 2025** (review 4 papers), **ICLR 2025** (review 3 papers), **NeurIPS 2024** (review 6 papers), and **AISTATS 2024** (review 6 papers). Technical Program Committee at **FLLM 2024** (review 3 papers).

- Journal: **PLOS ONE** (review 1 paper).

Research Awards

- *Geyer-Vardi Scholar* - Department of Computer Science, *Rice University* — March 2024
- *Travel Award for attending* **AISTATS 2024** *and* **ICLR 2024** - Department of Mathematics and Statistics, *Boston University* — March 2024
- *Student Research Award* - Undergraduate Research Opportunities Program (UROP), *Boston University* — June 2022
- *Travel Award for student member of American Mathematical Society* - Department of Mathematics and Statistics, *Boston University* — February 2022
- *Travel Award for Joint Mathematics Meetings 2022* - Undergraduate Research Opportunities Program (UROP), *Boston University* — December 2021
- *Travel Award for Mathematical Association of America MathFest 2021* - UROP, *Boston University* — July 2021
- *Student Research Award* - Undergraduate Research Opportunities Program (UROP), *Boston University* — June 2021

Teaching Experiences

- **Teaching Assistant** in Graduate Design and Analysis of Algorithms, Rice University — January 2025 - May 2025
  - Instructor: Nai-Hui Chia
- **Peer Tutor** for the Education Resource Center, Boston University — February 2021 - May 2024