Yijun Dong

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dyjdongyijun.github.io

Research Interests

Randomized numerical linear algebra, statistical learning theory.

Education

2018-present **Oden Institute, The University of Texas at Austin**,
Computational Science, Engineering, and Mathematics, Ph.D..
- Advisors: Per-Gunnar Martinsson and Rachel Ward
- Thesis proposal: Randomized Dimension Reduction with Statistical Guarantees
- Relevant coursework: Statistical Models for Big Data, Combinatorial Optimization, Large-Scale Optimization, Machine Learning, Randomized Algorithms, Theory of Probability, Scientific Computing in Machine/Deep Learning, Numerical Analysis: Linear Algebra, Numerical Analysis: Partial Differential Equations, Functional Analysis in Theoretical Mechanics

2014-2018 **Emory University**,
Applied Mathematics & Engineering Science, B.S., Magna Cum Laude.
- Advisors: Effrosyni Seitaridou and Eric Weeks
- Thesis: Crystals and Liquids in Gravitationally Confined Quasi-2D Colloidal Systems

Research Experience

2019-present **Graduate Research Assistant**,
Oden Institute, UT Austin, (Austin, TX).
- Randomized algorithms for matrix skeletonization
- Accuracy of randomized subspace approximations
- Sample efficiency of data augmentation consistency regularization
- Medical image segmentation with subpopulation shift

2015-2018 **Research Assistant**,
Weeks Lab & Seitaridou Lab, Emory University, (Atlanta, GA).
- Soft matter physics, biophysics

Teaching Experience

2020-2022 **Teaching Assistant**,
Department of Mathematics & Oden Institute, UT Austin, (Austin, TX).
- Numerical Analysis: Linear Algebra (Fall 2021, graduate)
- Differential Equations with Linear Algebra (Fall 2020, Fall 2022, undergraduate)

2015-2016 **Student Tutor**,
Department of Physics, Oxford College of Emory University, (Oxford, GA).
- Introduction to Physics, Modern Physics

Industry Experience

Jun-Aug 2022 **Research Intern**,
Dell Technologies, (Austin, TX).
- Semi-supervised tabular learning with consistency regularization

May-Aug 2021 **Research Intern**,
Dell Technologies, (Austin, TX).
- Streaming telemetry time series compression on edge devices

Awards

2019-2020	NIMS Graduate Fellowship	UT Austin
2018-2019	Peter O'Donnell Graduate Fellowship	UT Austin
2018	Trevor Evans Award Awarded to top graduate of Emory Department of Mathematics	Emory University
2017	Phi Beta Kappa, Sigma Pi Sigma	Emory University
2016	SURE Summer Research Fellowship	Emory University
2016	Dan C. Moore Mathematics Award	Emory University
2016	Williams Baird Physics Award	Emory University

Skills

Programming
- Proficient: Bash, Git, MATLAB, Python
- Prior knowledge: C++, IDL, Java, Julia, Mathematica, etc.

Language
- Chinese (native), English (proficient), Japanese

Publications and Preprints (∗ for equal contribution)

1. Shuo Yang*, **Yijun Dong***, Rachel Ward, Inderjit S Dhillon, Sujay Sanghavi, Qi Lei. "Sample Efficiency of Data Augmentation Consistency Regularization". *arXiv preprint arXiv:2202.12230*. (2022).
2. **Yijun Dong**, Per-Gunnar Martinsson. "Simpler is better: A comparative study of randomized algorithms for computing the CUR decomposition". *arXiv preprint arXiv:2104.05877*. (2021).
3. Chen Cheng*, **Yijun Dong***, Matthew Dorian*, Farhan Kamili*, Effrosyni Seitaridou. "Quantifying Biofilm Formation of *Sinorhizobium meliloti* Bacterial Strains in Microfluidic Platforms by Measuring the Diffusion Coefficient of Polystyrene Beads". *Open Journal of Biophysics*. (2017), 7, 157-173.

Talks and Presentations

1. Shuo Yang*, Yijun Dong*, Rachel Ward, Inderjit S. Dhillon, Sujay Sanghavi, Qi Lei. "Sample Efficiency of Data Augmentation Consistency Regularization". *SIAM Conference on Mathematics of Data Science (MDS22)*. San Diego, CA, Sep 2022.
2. Yijun Dong, Per-Gunnar Martinsson. "Simpler is Better: A Comparative Study of Randomized Matrix Skeletonization". *Oden Workshop on Randomized Numerical Linear Algebra*. Austin, TX, Apr 2022.
3. Yijun Dong, Per-Gunnar Martinsson. "Revitalize Classical Algorithms with

Randomization: Efficient Low-rank Approximations with Statistical Guarantees". *Jane Street Symposium 2022*. New York, NY, Jan 2022.

4. Yijun Dong, Per-Gunnar Martinsson. "A Randomized CUR Decomposition via Partially Pivoted LU Factorization". *SIAM Conference on Applied Linear Algebra (LA21)*. Virtual, May 2021.
5. Yijun Dong, Peiyao Wu, James Kindt, Eric Weeks. "Forming 2D colloidal crystals with sedimented colloids". *American Physical Society March Meeting*. Los Angeles, CA, March 2018.
6. Yijun Dong, Effrosyni Seitaridou. "Quantifying Biofilm Formation of *Sinorhizobium meliloti* by Measuring the Diffusion Coefficient of Polystyrene Beads in Microfluidic Platforms". *Summer Undergraduate Research Experience at Emory University (SURE) Symposium*. Atlanta, GA, August 2016.

Service

Journal reviewer for *SIAM Journal on Matrix Analysis and Applications*, *IMA Journal of Numerical Analysis*, and *BIT Numerical Mathematics*

References

Per-Gunnar Martinsson,
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The University of Texas at Austin,
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Rachel Ward,
Department of Mathematics & Oden Institute,
The University of Texas at Austin,
rward@math.utexas.edu.

Yuji Nakatsukasa,
Mathematical Institute,
University of Oxford,
nakatsukasa@maths.ox.ac.uk.