Yuxin Ma

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EDUCATION

Johns Hopkins University   08/2023 – Present
PhD in Applied Mathematics and Statistics   *Baltimore, MD, USA*

· Advised by Soledad Villar and Dmitriy (Tim) Kunisky.

University of Cambridge   10/2019 – 06/2023
MMath and BA (Hons) in Mathematics   *Cambridge, England, UK*

· Essay: *Statistics for Persistence Landscapes*, on Topological Data Analysis, advised by John Aston and Jacob Rasmussen.
· MMath (Part III) Grade: Honours Pass with Distinction.
· BA Grade: First-Class Honours (Final Year).

PUBLICATIONS († indicates equal contributions)

"On Transferring Transferability: Towards a Theory for Size Generalization." Eitan Levin[†], **Yuxin Ma**[†], Mateo Díaz, Soledad Villar. `arXiv:2505.23599` *To appear in NeurIPS* (2025). **Spotlight.**

"Nonlinear Laplacians: Tunable principal component analysis under directional prior information." **Yuxin Ma**, Dmitriy Kunisky. `arXiv:2505.12528` *To appear in NeurIPS* (2025). **Spotlight.**

"Tab this folder of documents: page stream segmentation of business documents." Thisanaporn Mungmeeprued, **Yuxin Ma**, Nisarg Mehta, Aldo Lipani. *Proceedings of the 22nd ACM Symposium on Document Engineering* (2022). **Best Overall Paper Award.**

WORK EXPERIENCE

Cydar Medical   08/2022 – 10/2022
Research Intern   *Cambridge, England, UK*

· Project Title: *Imposing topological priors in 3D medical image segmentation.*
· Conducted a comprehensive literature review on deep learning methods, including architecture design, loss functions, and post-processing, with a focus on topology-driven approaches.
· Systematically evaluated the performance of selected methodologies on proprietary clinical data.

JPMorgan Chase & Co   06/2022 – 08/2022
AI & Data Science Intern   *London, England, UK*

· Project Title: *Covariance estimation and forecasting of high-dimensional time-series using machine learning.*
· Independently developed a graph-based approach for processing large covariance matrices, integrating a graphical structure-learning model with spatiotemporal Graph Neural Networks in an end-to-end pipeline.
· Delivered a proof-of-concept, including data processing, model development, training, and evaluation, validated through experiments with historical intraday trading data.

Vector.ai   08/2021 – 02/2022 (Part-time)
Research Project   *London, England, UK*

· Project Title: *Page stream segmentation of business documents.*
· Introduced a new dataset and designed an evaluation metric for the task. Developed a model integrating visual and textual features, achieving a state-of-the-art F1 score of 0.95.
· This work led to a publication that received the Best Overall Paper Award at a conference on document engineering.

Softwire   06/2021 – 08/2021
Software Development Intern   *London, England, UK*

· Collaborated with a team to develop a backend service from the ground up. Streamlined a large codebase to centralize notification functionalities across services and added support for new communication channels. Improved the scalability and reliability of a membership communication system for a major client.

AWARDS AND SCHOLARSHIPS

Amazon AI PhD Fellowship JHU + Amazon Initiative for Interactive AI	2025 – 2026
Rufus S. Isaacs Graduate Fellowship Whiting School of Engineering, Johns Hopkins University	2025 – 2026
Data Science Fellowship Mathematical Institute for Data Science (MINDS), Johns Hopkins University	Spring 2024
Lila May Walkden Flounders Fellowship Whiting School of Engineering, Johns Hopkins University	2023 – 2024
Marie Lawrence Prize for Mathematical Tripos, Part III Lucy Cavendish College, University of Cambridge	2023
Marie Lawrence Prize for Mathematical Tripos, Part II Lucy Cavendish College, University of Cambridge	2022
Myson College Exhibition for Personal Achievement in Mathematical Tripos, Part IA Lucy Cavendish College, University of Cambridge	2020
Senior-Middle 1 (SM1) Scholarship (pre-university full scholarship) Ministry of Education, Singapore	2015 – 2019

TALKS

Some Thoughts on Size Generalization Graph Learning Meets Theoretical Computer Science Workshop, Simons Institute	08/12/2025
What is Topological Data Analysis? Graduate Student Seminar, Department of Applied Math and Statistics, Johns Hopkins University	03/26/2024

TEACHING

Teaching Assistant for *Optimization for Data Science* Department of Applied Mathematics and Statistics, Johns Hopkins University	Fall 2023, 2024
Mentor for the Directed Reading Program for undergraduate students Department of Applied Mathematics and Statistics, Johns Hopkins University	Spring 2024
Tutor at the Sutton Trust Mathematics Summer School for high school students Faculty of Mathematics, University of Cambridge	Summer 2020
Freelance tutor for high school mathematics	*2019*

SERVICE

Reviewed for NeurIPS NPGML Workshop (2025), TMLR (2025).