

LINGHAI LIU

(401) 347-4178 ◊ linghai.liu@yale.edu ◊ <https://l1iu58b.github.io/>

EDUCATION

Yale University 2023 - Present

Ph.D. in Statistics & Data Science

Brown University 2019 - 2023

B.S. in Applied Mathematics - Computer Science (*Honors*) | B.A. in Mathematics

SELECTED RESEARCH EXPERIENCES

Topological Representations for Neural Networks 📄 May 2022 - May 2023
Advisor: Stuart Geman *Brown University*

- Design generative models capable of learning a richer collection of abstract relationships using a multinomial idealization of biological neurons while ensuring model hierarchy and reusibility.
- Implement the above models. Develop statistics that exploit the patterns of neuronal activities with topological structures such as cycles that can potentially be used to represent relationships.

Jacobian-free Backpropagation in Inverse Problems 📄 🔄 🔗 May 2022 - Jan 2024
Advisor: Samy Wu Fung *REU Researcher, Emory University*

- Compared classical optimization, standard feed-forward networks (Denoising CNN), Deep Unrolling methods, and implicit deep learning with applications to inverse problems in imaging.
- Trained implicit networks to denoise images using Jacobian-free Backpropagation with fixed memory costs, which yielded comparable results with current models.
- "Training Implicit Networks for Image Deblurring using Jacobian-Free Backpropagation." arXiv preprint arXiv:2402.02065 (2024). In submission.

TEACHING & MENTORING

Teaching Assistant at Brown University

- CSCI1952Q: Algorithmic Aspects of Machine Learning (TA) Spring 2023
- APMA1660: Statistical Inference II (TA) Spring 2023
- APMA1690: Computational Probability & Statistics (TA) Fall 2022
- APMA1740/2610*: Recent Applications in Probability & Statistics (TA) Spring 2022
- DATA1010*: Probability, Statistics and Machine Learning (TA) Fall 2021
- CSCI1470/2470*: Deep Learning (Head TA) Fall 2021
- APMA1650: Statistical Inference I (TA) Spring 2021

* Courses at graduate level

Peer Advisor, Meiklejohn Peer Advising Program 2020 - 2021

- Advised 5 freshmen on academic and career development jointly with a faculty member.

HONORS & AWARDS

Magna Cum Laude, Brown University	2023
Sigma Xi, Brown University	2023
Senior Prize in Computer Science, Brown University	2023
Emory REU/RET Computational Mathematics for Data Science, Emory University	2022
Second place, Henry Parker Manning Mathematical Prizes, Brown University	2022
BrownConnect SPRINT Undergraduate Teaching & Research Awards, Brown University	2021
Second place (tied), Hartshorn-Hypatia Freshman Math Contest, Brown University	2019

TECHNICAL STRENGTHS

Computer Languages	Python, Matlab, R, LaTeX, Stata, Java, C
Languages	English, Chinese, French

Date of Preparation: April 9, 2024