Jiuru Lyu

400 Dowman Dr, Atlanta, GA 30322
+1 (404)-791-0290 ◇ jiuru.lyu@emory.edu ◇ GitHub ◇ LinkedIn ◇ Website

EDUCATION

B.S. in Applied Mathematics and Statistics, Minor in Computer Informatics — Aug 2022 – May 2026
Emory University, Emory College of Arts and Sciences — *Atlanta, GA*

- **Cumulative GPA**: 3.99/4.0, **Major GPA**: 4.0/4.0; Dean's List
- **Coursework**: Iterative Methods (Grad), Numerical Linear Algebra (Grad), Numerical Analysis (Grad), Real Analysis, Optimization Methods, Mathematical Statistics, Differential Equations, Graph Theory, Machine Learning, Deep Learning, Regression Analysis, Causal Inference, Data Structures & Algorithms, Database System
- **Research Interests**: Iterative Methods, Numerical Optimization, Mean-Field Games, Machine Learning

RESEARCH EXPERIENCES

Research Assistant: Global Optimization — Oct 2023 – Present
Department of Mathematics, Emory University — *Atlanta, GA*

- Conducted independent research on Double Descent with Color Diffusion (DDCID) and other Global Optimization methods under the supervision of Dr. Manuela Manetta; to develop results into an honors thesis
- Implemented a log-barrier regularization and the continuation method to enhance the algorithm for finding high-dimensional Morse Potential problems; cross-validated outcomes against the Cambridge Database
- Applied the algorithm to COVID-19 modeling; recasted ODE constraints to an adjoint-based dual form for efficient optimization; improved the hyperparameter tuning stability
- Explored ways to integrate derivative-free optimization techniques into the algorithm to enhance efficiency

Research Assistant: PDHG Algorithm for Non-Potential Mean-Field Games — Feb 2025 – Present
Department of Mathematics, Emory University — *Atlanta, GA*

- Conducted research on a PDHG solver for non-potential mean-field games supervised by Dr. Levon Nurbekyan
- Developed a general-purpose Python implementation of Primal-Dual Hybrid Gradient (PDHG) solver for non-potential Mean-Field Games (MFGs) with space-time discretization using sparse linear algebra package SciPy
- Assembled discrete operators and block matrices; engineered convergence diagnostics and invariants for MFG structure; accelerated the solver via iterative methods and matrix caching; parallelized the solver

Research Assistant: Spectral Graph Theory — Jan 2025 – Jul 2025
Department of Mathematics, Emory University — *Atlanta, GA*

- Studied the relationship between Spectral Graph Theory and ODEs under the guidance of Dr. Manuela Manetta
- Led weekly discussion sessions on papers related to spectral graph theory and their relationships with ODEs
- Implemented centrality and other Network Analysis pipelines for the Emory Mathematics Department faculty network; identified communities/bridges and summarized collaboration insights
- Compared symmetrization schemes for directed graphs and their impact on diffusion and ODE dynamics

AWARDS AND HONORS

Wilson Family Undergraduate Research Award — May 2025
Department of Mathematics, Emory University — *Atlanta, GA*

- Chosen by a faculty committee as an outstanding third-year undergraduate student in Mathematics; received research funding and support to advance the Global Optimization project

Phi Eta Sigma Honor Society Feb 2023
Emory Chapter of Phi Eta Sigma National Honor Society *Atlanta, GA*

- National-wide freshman honor society; invitation based on scholastic achievements during freshman year

TEACHING/MENTORING EXPERIENCES

Academic Success, Emory Office of Undergraduate Education Sep 2023 – Present
Peer Tutor in Mathematics *Atlanta, GA*

- Provided 1-to-1 tutoring services for Calculus II, Multivariable Calculus, and Linear Algebra
- Helped 30+ students prepare for exams and improve grades; received positive feedback from tutees

Emory Department of Data and Decision Sciences Aug 2024 – Dec 2024
Teaching Assistant for DATASCI 151 (Scientific Computing with Python) *Atlanta, GA*

- Held weekly 1-hour office hours to help students clarify confusions and prepare for homework
- Designed homework assignment connecting SQL with Python based on real-world data extracted from Kaggle

INTERNSHIPS

Baker Hughes Jun 2024 – Aug 2024
Digital Technology Intern *Shanghai, China*

- Applied Agile development workflows to a valve lifecycle management system (VKAM); implemented soft-delete and advanced-filter features; improved customer report UI designs for better user experience
- Wrote and executed 100+ regression test cases, gained hands-on experience in database validation; discovered 30+ bugs or outdated tests; helped maintain consistent test case writing styles

Algory Capital Jan 2023 – Aug 2024
Quantitative Investment Analyst *Atlanta, GA*

- Oversaw risk assessment of Algory Capital, a student-managed fund with $100,000 AUM; implemented Monte Carlo Simulations to calculate Conditional Value at Risk (cVaR); integrated insights into a grid search algorithm
- Developed advanced trading strategies (e.g., mean reversion pair trading and ADF tests); performed sentiment analysis using Reddit API and web-scraping tools to inform portfolio management decisions

ADDITIONAL INFORMATION

Skills	LaTeX, MATLAB, Python, R, Java, PostgreSQL, HTML, CSS, JavaScript, TypeScript, Angular
Languages	Mandarin Chinese (Fluent), English (Fluent), Spanish (Elementary).
Interests	Specialty Coffee, Traveling, Photography, Mathematics Through Movement.

SELECTED INFORMAL PRESENTATIONS

- *An Analysis on Faculty Connection Network*, Spectral Graph Theory Project Apr 25, 2025
- *Global Optimization of Morse-Cluster Potential*, Global Optimization Project Feb 7, 2025
- *Numerical Optimization*, Emory Math Directed Reading Program Dec 4, 2025
- *Calculus of Variation*, Nonlinear Optimization Final Group Project Apr 29, 2024
- *Probabilistic Tools in Hypergraph Coloring*, Emory Math Directed Reading Program Nov 30, 2023