

Jiajia Yu

Email: jiajia.yu@duke.edu • Personal Website: <https://jiajia-yu.github.io/> •

Research interests

Overall	Applied and computational math, scientific computing and non-Euclidean domain problems
Current focus	Numerical methods and applications of mean-field games and optimal transport

Employment

Aug. 2023 – July 2026	Duke University – Durham, NC Phillip Griffiths Assistant Research Professor Mentors: Prof. Hongkai Zhao and Prof. Xiuyuan Cheng
Sept. 2018 – May 2023	Rensselaer Polytechnic Institute – Troy, NY Research Assistant and Teaching Assistant

Education

2018 – 2023	Rensselaer Polytechnic Institute – Troy, NY Mentors: Prof. Rongjie Lai Ph.D. in Mathematics. <i>GPA: 4/4</i>
2013 – 2017	Beijing Normal University – Beijing, China B.S. in Mathematics and Applied Mathematics. <i>Major GPA: 96/100</i>

Publications

Journal articles

- [3] **Jiajia Yu**, Rongjie Lai, Wuchen Li, Stanley Osher, *A Fast Proximal Gradient Method and Convergence Analysis for Dynamic Mean Field Planning*, Mathematics of Computation, July 24, 2023. <https://doi.org/10.1090/mcom/3879>
- [2] Han Huang, **Jiajia Yu**, Jie Chen, Rongjie Lai, *Bridging Mean-Field Games and Normalizing Flows with Trajectory Regularization*, Journal of Computational Physics, Vol. 487, 112155, 2023. <https://doi.org/10.1016/j.jcp.2023.112155>
- [1] **Jiajia Yu**, Rongjie Lai, Wuchen Li, Stanley Osher, *Computational Mean-field Games on Manifolds*, Journal of Computational Physics, Vol. 484, 112070, 2023. <https://doi.org/10.1016/j.jcp.2023.112070>

Preprints

- [1] **Jiajia Yu**, Quan Xiao, Rongjie Lai, Tianyi Chen, *A Bilevel Optimization Approach for Inverse Mean-Field Games*, In preparation, 2023.

Awards

- 2023 **Karen and Lester Gerhardt Prize**, School of Science, Rensselaer Polytechnic Institute
- 2023 **Joaquin B. Diaz Memorial Prize**, Department of Mathematical Sciences, Rensselaer Polytechnic Institute
- 2022 **AWM Travel Grant**, Association for Women in Mathematics

Professional Services

Conference Organization

- Oct. 2023 mini-symposium at SIAM NYNJPA 1st Annual Meeting, New Jersey Institute of Technology, Newark, NJ.
Optimal Transport: Computation, Applications, and Extensions, co-organize with Rongjie Lai (Purdue).

Journal Referee

Journal of Computational Physics.

Presentations

Invited Seminar Talks

- Oct. 2023 Computational mean-field games: from conventional methods to deep generative models
IMA Data Science Seminar, University of Minnesota, Minneapolis, MN.
- Oct. 2023 A bilevel optimization approach for inverse mean-field games
RTG Seminar, University of South Carolina, Columbia, SC.
- July 2023 (Virtual) Computational mean-field games: from conventional methods to deep generative models
Summer School on Mathematical Foundation of Data Science, University of South Carolina.
- June 2022 (Virtual) Computational mean-field games on manifolds
Optimal Transport and Mean-Field Games Seminar, University of South Carolina.
- March 2021 (Virtual) An efficient and flexible algorithm for dynamic mean-field planning and convergence analysis
Optimal Transport and Mean-Field Games Seminar, University of South Carolina.

Conference Talks

- Oct. 2023 Computational mean-field games on manifolds
Optimal Transport: Computation, Applications, and Extensions, SIAM NYNJPA 1st Annual Meeting, New Jersey Institute of Technology, Newark, NJ.
- Aug. 2023 A bilevel optimization approach for inverse mean-field games
Optimization in Machine Learning, Conference on Modeling and Optimization: Theory and Applications (MOPTA), Lehigh University, Bethlehem, PA.
- Nov. 2023 A bilevel optimization approach for inverse mean-field games
Triangle Computational and Applied Mathematics Symposium, Duke University, Durham, NC.
- June 2022 Computational mean-field games on Euclidean space and manifolds
The 2022 AWM Research Symposium Poster Session, University of Minnesota, Minneapolis, MN.

Teaching

Instructor, Duke University, Durham, NC

- 2024 Spring Math 466/766 Mathematics of Machine Learning
- 2023 Fall Math 465/765 Introduction to High-Dimensional Data Analysis, co-teach with Prof. Xiuyuan Cheng
- Teaching Assistant, Rensselaer Polytechnic Institute, Troy, NY
- 2019 Fall MATH 4400 Ordinary Differential Equations and Dynamical Systems, Instructor: Prof. Gregor Kovačič
- 2019 Fall MATH 4200 Mathematical Analysis I, Instructor: Prof. Bruce Piper
- 2019 Spring MATH 4020 Introduction to Number Theory, Instructor: Prof. Bruce Piper
- 2018 Fall MATH 4200 Mathematical Analysis I, Instructor: Prof. Fengyan Li
- 2018 Fall MATH 4040 Introduction to Topology, Instructor: Prof. Bruce Piper

Outreach

- 2022 – 2023 Vice President of AWM Student Chapter at RPI