

JIAJIE (JERRY) LUO

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Last update: February 5, 2025

EMPLOYMENT

Postdoctoral Scholar October 2024 – Present
The Knowledge Lab
University of Chicago
Faculty Mentor: Professor James Evans

Ph.D. Research Intern June 2022 – September 2022
Mathematics, Statistics, and Data Science
Pacific Northwest National Laboratory
Mentors: Dr. Tegan Emerson; Dr. Gregory Henselman-Petrusek Roek

EDUCATION

University of California, Los Angeles September 2019 – June 2024
Ph.D. in Mathematics.
Thesis Title: Topics in Persistent Homology and Complex Social Systems
Advisor: Professor Mason Porter

University of California, Santa Barbara September 2017 – June 2019
M.A. in Mathematics.
Thesis Title: On Abstract Witt Rings and Quadratic Extensions
Advisor: Professor Bill Jacob

University of California, Santa Barbara September 2014 – June 2017
College of Creative Studies
B.S. in Mathematics, *Highest Honors*
Faculty Advisor: Professor Jeffrey Stopple

RESEARCH INTERESTS

Topological Data Analysis, Persistent Homology and Applications, Complex Systems, Opinion Dynamics on Networks

PREPRINTS & PUBLICATIONS

G. J. Li, **J. Luo**, W. Chu, *Bounded-Confidence Models of Multi-Dimensional Opinions with Topic-Weighted Discordance*, arXiv:2502.00284

J. Luo, G. Henselman-Petrusek, *Interval Decomposition for Persistence Modules Over a Principal Ideal Domain*, arXiv:2310.07971

G. J. Li*, **J. Luo***, M. A. Porter, *Bounded-Confidence Models of Opinion Dynamics with Adaptive Confidence Bounds*, arXiv:2303.07563 (*Equal Contribution), To Appear in *SIAM Journal on Applied Dynamical Systems*

A. Hickok*, B. Jarman*, M. C. Johnson*, **J. Luo***, M. A. Porter, *Persistent Homology for Resource*

Coverage: A Case Study of Access to Polling Sites, Published in *SIAM Review*.

V. Chayes, K. Miller, R. Bhalerao, **J. Luo**, W. Zhu, A. Bertozzi, W. Liao, S. Osher, *Pre-Processing and Classification of Hyperspectral Imagery Via Selective inpainting*, Published in *ICASSP2017*

EXPOSITORY ARTICLES

G. J. Li, **J. Luo**, K. Peng, and M. A. Porter. *Using Mathematics to Study How People Influence Each Other's Opinions*, Published in *Frontiers for Young Minds*.

AWARDS, HONORS & FELLOWSHIPS

Pacific Journal of Mathematics Dissertation Prize	2024
ModEling and uNdersTanding human behaviOR (MENTOR) Fellowship	2021–2022
College of Creative Studies Commencement Speaker	2017
Adil Yaqub is my Hero Scholarship	2016

TALKS & PRESENTATION

Southern California Applied Mathematics Symposium (SOCAMS) Bounded-Confidence Models of Opinion Dynamics with Adaptive Confidence Bounds	April 2024
Graduate Student Topology and Geometry Conference (GSTGC2024) Interval Decomposition of Persistence Modules over a Principal Ideal Domain (Poster Session)	April 2024
Joint Mathematics Meetings 2024 (JMM 2024) AMS Special Session on Complex Social Systems I Persistent Homology for Assessing Facility Placement (Invited Talk)	January 2024
2023 Algorithms for Threat Detection PI Workshop (ATD2023) Bounded-Confidence Models of Opinion Dynamics with Adaptive Confidence Bounds	October 2023
Computation Persistence Workshop (ComPer23) Interval Decomposition for Persistence Modules of Free Abelian Groups	September 2023
SIAM Conference on Applications of Dynamical Systems (DS23) Bounded-Confidence Models of Opinion Dynamics with Adaptive Confidence Bounds	May 2023
Southern California Applied Mathematics Symposium (SOCAMS) Persistent Homology for Resource Coverage: A Case Study of Access to Polling Sites	April 2023
SIAM Workshop on Network Science (NS22) Bounded-Confidence Models with Adaptive Confidence Bounds	September 2022
Virtual Research Symposium, Pacific Northwest National Laboratory. Topological Data Analysis and Machine Learning	August 2022

TEACHING EXPERIENCE

As Graduate Student Instructor (UCLA) Math 110A: Abstract Algebra	Winter 2024
Math 115A: Linear Algebra (proof-based)	Winter 2023
As Graduate Teaching Assistant (UCLA) Math 31AL: Differential and Integral Calculus Laboratory	Winter 2021
Math 115A: Linear Algebra (proof-based)	Fall 2020, Spring 2021
Math 31B: Integration and Infinite Series	Spring 2020
Math 33A: Linear Algebra and Application	Winter 2020, Fall 2020, Spring 2021
Math 3B: Calculus for Life Sciences II	Fall 2019, Winter 2021
As Graduate Teaching Assistant (UCSB)	

Math 117: Methods of Analysis	Spring 2019
Math 108A: Introduction to Linear algebra (proof-based)	Winter 2019
Math 4A: Linear Algebra and Applications	Fall 2018
MATH 100B: Mathematics for Elementary Teaching II	Summer 2018
Math 34B: Calculus for Social Sciences II	Winter 2018, Spring 2018
Math 34A: Calculus for Social Sciences I	Fall 2017

UNDERGRADUATE MENTORING

Research Mentoring:

William Flowers — Bounded-Confidence Models of Opinion Dynamics	Fall 2024 – Present
Yuxuan Wu — A Bounded-Confidence Model with Adaptive Edge Weights	Summer 2024 – Present
Leila Thompsky — A Bounded-Confidence Model with Adaptive Edge Weights	Fall 2023 – Present
Amos Ancell — Persistent Homology for Resource Coverage	Fall 2023 – Spring 2024
Ruyi Lu — Bounded-Confidence Models on Random Configuration Models	Winter 2023 – Fall 2023
Xinyue (Serena) Li — Persistent Homology for Resource Coverage	Winter 2023 – Spring 2023
Xiaohu (Haley) Zhang — Bounded-Confidence Models with Repulsion	Winter 2022 – Spring 2022

Directed Reading Program:

DRP Committee	Fall 2021 – Spring 2024
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Students:

Yuxuan (Yolanda) Wu — Models of Opinion Dynamics	Spring 2024
Leila Thompsky — Complex Social Systems	Fall 2023
Amos Ancell — Applied Topology, Persistent Homology	Winter 2023 – Spring 2023
Xinyue (Serena) Li — Applied Topology, Persistent Homology	Fall 2022 – Winter 2023
Ruyi Lu — Opinion Dynamics on Networks	Fall 2022 – Winter 2023
Haoyang Lyu — Applied Topology, Persistent Homology	Winter 2022 – Spring 2022
Chenxin (Amy) Shen — Applied Topology, Persistent Homology	Fall 2021 – Spring 2022
Xiaohu (Haley) Zhang — Opinion Dynamics on Networks	Fall 2021 – Winter 2022
Tanishq Bhatia — Topics in Persistent Homology	Winter 2021 – Spring 2021

Other Mentoring:

Mentor for UCLA Applied Mathematics REU (ATD Traffic Challenge)	Summer 2021
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Students:

- Matthew Hudes (Tufts University)
- Naji Sarsam (UCLA)
- Chenxin (Amy) Shen (UCLA)
- Wenwen Tang (USC)

MISCELLANEOUS

Citizenship: United States
 Programming Experience: Python, MATLAB, R., C++
 Languages: Chinese (Mandarin), English.