Jiantong Liu

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GENERAL RESEARCH INTEREST

- Algebraic Topology, Algebraic Geometry, Category Theory.

- Cognition, Memory.

EDUCATION

University of California, Los Angeles   Los Angeles, CA
  GPA: 3.95   Sept 2019 - Jun 2023

B.S. Mathematics, Highest Departmental Honors.
  Major GPA: 3.985
  Graduate Coursework: Category Theory, Algebra, Homological Algebra, Commutative Algebra,
  Differential Topology, Algebraic Number Theory.
  Undergraduate Coursework: Honors Algebra series, Honors Analysis series, Honors Linear Algebra series,
  Honors Complex Analysis, Ordinary Differential Equations, Partial Differential Equations, Optimization,
  Probability and Statistics, Algorithm.

B.S. Cognitive Science, with Specialization in Computing.
  Major GPA: 3.977
  Coursework: Behavioral Neuroscience, Cognitive Psychology, Neural Network, Psycholinguistics,
  Computational Theory of Mind.

RESEARCH WORK

In Preperation

- **Bounds on Simple Hexagonal Lattice and Classification of** 11**-stick Knots** (joint work with
  Yueheng Bao, Ari Benveniste, Ansel Goh, and Ethan Sherman, supervised by Marion Campisi and
  Nicholas Cazet), October 2022.

Ongoing

- **Effect of video games on visual learning.**

Internal Report

- **A Compartmental Model for the Dynamics of Gang Embeddedness and Youth Delinquency** (with Antonia Fabian, Haoyang Lyu, Thien Tran, and Haley Xiaohe Zhang), August 2021.

TALKS/PRESENTATIONS

AMS Special Session at Joint Mathematical Meeting. *"Bounds on Simple Hexagonal Lattice and Classification of 11-stick Knots."* Jan 2023, Boston, Massachusetts.

Polymath Jr Program Colloquium. *"Bounds on Simple Hexagonal Lattice."* Aug 2022, Los Angeles, California.

Directed Reading Program Colloquium. *"Enriched Categories and Applications."* Mar 2022, Los Angeles, California.

UCLA CAM REU Colloquium. *"Final Report on Gang Reduction and Youth Development Program."* Aug 2021, Los Angeles, California.

HONORS AND AWARDS

UCLA Dean's Honors List . . . . 8 out of 9 quarters from Fall 2019 to Spring 2022
UCLA Mathematics Departmental Honors, Highest Honors . . . . expected June 2023

TEACHING/RESEARCH EXPERIENCE

Polymath Jr Los Angeles, CA
  Undergraduate Researcher at Mathematical Research Program Jun 2022 - Present
  Work on a project in combinatorial knot theory under the supervision of Dr. Marion Campisi of San Jose State University. The project mostly focuses on knots in simple hexagonal lattices, where we study the stick number and other properties of knots.
  Represented the group to give a talk at the final colloquium of the program.
  Will represent the group to give a talk at the Joint Mathematics Meeting (JMM) in January 2023.

Los Angeles Math Circle Los Angeles, CA
  Assistant Instructor Aug 2021 - Present
  Teach grade 8-9 students about topics in Number Theory, Graph Theory, Group Theory and Algorithms, and lead a discussion group of 4-6 students weekly.

University of California, Los Angeles Los Angeles, CA
  Lab Research Assistant at Psychology Department Mar 2022 - Present

As a research assistant at Zili Lab, assist graduate students with their experiments while learning about object recognition.

Starting from Fall 2022, participate in the research project "Effect of video games on visual learning". This research project aims to quantify and evaluate the utility of action video games (first-person shooters) as training for visual skills. I mainly assist with data collection and coding portion of the research.

University of California, Los Angeles Los Angeles, CA
Undergraduate Researcher at UCLA CAM REU Jun 2021 - Aug 2021

Worked in the Los Angeles GRYD Program (Gang Reduction Youth Development) research team and focused on compartmental modeling, stability analysis, and center manifold theory. The results were integrated as part of a final report "A Compartmental Model for the Dynamics of Gang Embeddedness and Youth Delinquency" along with a final presentation at the end of the REU program. My supervisors were Dr. David Hyde, Dr. Chuntian Wang, Dr. Andrea Bertozzi, Dr. Paul Brantingham, and Yotam Yaniv.

University of California, Los Angeles Los Angeles, CA
Grader at Mathematics Department Sept 2020 - Sept 2022

Graded homework, quizzes and tests and provided feedback for many courses, including:

- MATH 115AH (Honors Linear Algebra): Fall 2020 - Winter 2022

- MATH 115A (Linear Algebra): Summer 2021, Summer 2022

- MATH 105 Series (Mathematics and Pedagogy for Teaching Secondary Mathematics): Fall 2021 - Spring 2022

INDIVIDUAL PROJECTS

Lecture Notes Compilation Jun 2021 - Present

Write a series of lecture notes on topics of algebra and topology, based on the UCLA graduate courses.

Lecture Series Apr 2022 - Present

Record a series of lecture videos on basic category theory, mostly based on the lecture notes I compiled, as well as *Category Theory in Context* by Emily Riehl and *Algebra* by Serge Lang.

VOLUNTEER ACTIVITIES

Maki's Lab Sept 2022 - Present
Teaching Assistant for MAT2B10, Abstract Algebra

Answer students' questions on Piazza forum and provide feedback for the instructor.

Organization of Transformative Works (OTW)   Oct 2018 - Present
Translator and Uploader, Translation Committee   Oct 2018 - Present
Support Staff, Support Committee   May 2022 - Present
Tag Wrangler, Tag Wrangling Committee   Sept 2020 - Aug 2021

SEMINARS RECENTLY ATTENDED

- **UCLA Directed Reading Program**   Jan 2022 - Present
- **UCLA Algebraic Topology Seminar**   Jan 2022 - Present
- **∞-category Reading Seminar**   Aug 2022 - Present
- **The HOTTest Summer School**   Jul 2022 - Aug 2022
- **∞-topoi Reading Course**   Mar 2022 - May 2022
- **UCLA Distinguished Lecture Series by Emily Riehl**   May 2022
- **UCLA Psychology Neural Network Laboratory**   Jan 2022 - Mar 2022
- **UCLA Research Seminar on Category Theory**   Mar 2021 - Jun 2021

TECHNICAL SKILLS

Programming Language
R, Python, Java, C++

Other Mathematical Tools
MATLAB, Lean, Agda

General Tools
WordPress