

# Lực Đình-Khương Ta

ldt37@pitt.edu · +1 503 810 3103 · luc-ta.github.io · 301 Thackeray Hall, Pittsburgh, PA 15260

## EDUCATION

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### University of Pittsburgh

Mathematics Ph.D. student, Kenneth P. Dietrich School of Arts and Sciences

Pittsburgh, PA

Aug 2025 – present

- **Selected coursework:** Lie Theory: Algebraic Groups (in progress), Introduction to Langlands (in progress)

### Yale University

B.A. Mathematics (intensive track) & Ethnicity, Race, and Migration; GPA: 3.82

New Haven, CT

Aug 2021 – May 2025

- **Graduate coursework:** Representation Theory (grade: A), Flavors of Hyperbolicity in Geometric Group Theory (grade: A), Commutative Algebra and Category Theory (grade: A), Algebraic Topology (grade: B), Quantum Invariants of Knots and 3-Manifolds (grade: A)
- **Bachelor's thesis:** Available on arXiv [7]; advised by Sam Raskin; awarded grade A

### Budapest Semesters in Mathematics

Study abroad; GPA: 4.0

Budapest, Hungary

Jun 2023 – Aug 2023

## RESEARCH EXPERIENCE

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### REU: Research Challenges of Computational Methods in Discrete Mathematics

Moravian University, Department of Mathematics

Bethlehem, PA

May 2024 – Jul 2024

- **Supervisors:** Samantha Pezzimenti (Widener University) and Wing Hong Tony Wong (Kutztown University)
- Conducted [8, 9] using methods from topology, knot theory, algebra, and combinatorics and Python algorithms

## PUBLICATIONS

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### PREPRINTS

- [1] *Distinguishing power of 4-Legendrian permutation racks*, with Peyton Phinehas Wood. [arXiv:2510.26619](#), 2025. 13 pages.
- [2] *Groups versus quandle-like invariants of 3-manifolds*. [arXiv:2509.24098](#), 2025. 11 pages. Submitted.
- [3] *Good involutions of twisted conjugation subquandles and Alexander quandles*. [arXiv:2508.16772](#), 2025. 18 pages. Submitted.
- [4] *Good involutions of conjugation subquandles*. [arXiv:2505.08090](#), 2025. 32 pages. Submitted.
- [5] *Enumeration of virtual quandles up to isomorphism*. [arXiv:2506.16536](#), 2025. 11 pages. Submitted.
- [6] *Graph quandles: Generalized Cayley graphs of racks and right quasigroups*. [arXiv:2506.04437](#), 2025. 19 pages.
- [7] *Classification and structure of generalized Legendrian racks*. [arXiv:2504.12671](#), 2025. 29 pages. Submitted.
- [8] *Constructions of and bounds on the toric mosaic number*, with Kendall Heiney, Margaret Kipe, Samantha Pezzimenti, and Kaelyn Pontes. [arXiv:2504.02265](#), 2025. 21 pages. Submitted.

### PEER-REVIEWED ARTICLE

- [9] *Bounds on the mosaic number of Legendrian knots*, with Margaret Kipe, Samantha Pezzimenti, Leif Schaumann, and Tony W. H. Wong. *J. Knot Theory Ramifications* **34** (2025), no. 12, Paper No. 2550055, [doi:10.1142/S0218216525500555](#). 52 pages. (Preprint available on [arXiv](#).)

## EDITOR-REVIEWED PUBLICATIONS

- [10] Integer sequences [A383144–A383146](#), [A383828–A383831](#), [A385040–A385041](#), [A386231–A386234](#), and [A387317](#) related to various topics in group theory and nonassociative algebra (see [3–7]) and [A375353–A375357](#), [A375392](#), [A375619](#), and [A376155](#) related to combinatorics. *On-Line Encyclopedia of Integer Sequences (OEIS)*, 2025.
- [11] Integer sequences [A374939](#), [A374942–A374947](#), and [A375354](#) related to Legendrian knot mosaics (see [9]), with Margaret Kipe, Samantha Pezzimenti, Leif Schaumann, and Wing Hong Tony Wong. *On-Line Encyclopedia of Integer Sequences (OEIS)*, 2024.

## PRESENTATIONS

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<b>Legendrian Knots and Rack-Theoretic Coloring Invariants</b> SIAM Conference PD25, <a href="#">Contributed Presentation Session 9</a>	Pittsburgh, PA Apr 2025
<b>From Groups to Nonassociative Knot Invariants</b> Graduate Student Seminar University of Pittsburgh	Pittsburgh, PA Sep 2025
<b>Why Knot? Algebraic Coloring Invariants of Legendrian Knots</b> Mellon Forum (general audience), Grace Hopper College, Yale University	New Haven, CT Apr 2025
<b>Generalized Legendrian Racks: Knot Coloring Invariants &amp; Algebraic Classification</b> Hudson River Undergraduate Mathematics Conference, Union College	Schenectady, NY Apr 2025
<b>Computing the Mosaic Numbers of Legendrian Knots</b> Joint Mathematical Meetings, Spectra Special Session on Research by LGBTQ+ Mathematicians	Seattle, WA Jan 2025
<b>Thrown for a Loop: A Survey of Knot Theory</b> (half expository, half research talk) Pizza Seminar Series, Yale Undergraduate Mathematics Society, Yale University	New Haven, CT Sep 2024
<b>Toric Knot Mosaics</b> (with Kendall Heiney) UnKnot V Conference, Seattle University, Department of Mathematics	Seattle, WA Jul 2024
<b>Legendrian Knot Mosaics</b> (with Margaret Kipe and Leif Schaumann) REU Symposium, Gettysburg College, Department of Mathematics	Gettysburg, PA Jun 2024

## TEACHING

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<b>Lie Groups, Lie Algebras, and Representation Theory</b> Mentor, Directed Reading Program	University of Pittsburgh Sep 2025 – present
<ul style="list-style-type: none"><li>– Hold weekly one-on-one meetings to mentor an undergraduate student studying Lie theory, culminating in an end-of-term project and colloquium presentation</li><li>– Developed an original syllabus using <i>Lie Groups, Lie Algebras, and Representations</i> by Brian Hall</li></ul>	
<b>Preparation for Scientific Calculus</b> Substitute Teaching Assistant	University of Pittsburgh Sep 2025
<ul style="list-style-type: none"><li>– Led semiweekly practice sessions and administered exams for 30 precalculus students</li></ul>	
<b>Fields and Galois Theory</b> Undergraduate Learning Assistant	Yale University Jan 2025 – May 2025
<ul style="list-style-type: none"><li>– Served as one of two TAs for 22 students; held regular office hours, small group tutoring sessions, and review sessions; designed original exam review materials; held regular one-on-one tutoring sessions; graded assignments</li></ul>	
<b>Introduction to Abstract Algebra</b> Undergraduate Learning Assistant	Yale University Aug 2024 – Dec 2024
<ul style="list-style-type: none"><li>– Served as one of two TAs for 41 students; held regular office hours and interactive exam review sessions; designed original exam review materials</li></ul>	

## **Analysis II: Lebesgue Integration and Complex Fourier Series**

Undergraduate Learning Assistant

Yale University

Jan 2024 – May 2024

- Created and distributed original exam review materials; designed and conducted multiple interactive exam review sessions and collected student feedback throughout the term; held regular office hours
- Served as the only on-campus ULA for all 40 students; wrote and provided solution sets to assist the off-campus ULA

## **Real Analysis**

Undergraduate Learning Assistant

Yale University

Aug 2023 – Dec 2023

- Designed and led weekly proof-writing workshops to introduce 44 students to set-theoretic concepts, proof techniques, and mathematical writing; conducted interactive midterm and final exam review sessions; held regular office hours

## **Introduction to Functions and Calculus I-II**

Undergraduate Learning Assistant and Peer Tutor

Yale University

Aug 2022 – May 2023

- Designed and led semiweekly interactive practice workshops; organized and conducted weekly small-group review sessions; created original practice problems for all 88 students and solution sets for other ULA's to consult during workshops

## **EMPLOYMENT**

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### **Web Developer**

Yale University Bands

New Haven, CT

Aug 2023 – May 2025

- Applied HTML, CSS, and JavaScript to oversee web development for Yale's concert, jazz, and marching bands

### **Undergraduate Learning Assistant**

Yale University, Department of Mathematics

New Haven, CT

Aug 2022 – May 2025

- Hired after a highly selective interview and teaching evaluation process with mathematics faculty
- For further information, please refer to the "Teaching" section above.

### **Mathematics Tutor**

Self-employed

New Haven, CT and remote

Aug 2021 – present

- Work one-on-one with students of all ages to develop and reinforce mathematical confidence, review material for courses and standardized testing, and nurture mathematical curiosity by exploring connections to higher mathematics

### **Event Assistant**

"Crossroads of Algebra, Geometry, and Physics" Conference at Yale University

New Haven, CT

May 2022

- Worked alongside mathematics faculty and staff to facilitate and usher for a Yale mathematics conference
- Took advantage of the opportunity to attend presentations and explore algebraic geometry as a future research interest

## **SERVICE**

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### **Co-Secretary, Graduate Student Organization**

University of Pittsburgh, Department of Mathematics

Pittsburgh, PA

Sep 2025 – present

- Elected to take notes at meetings, share meeting minutes with the department, and maintain student resources for graduate students

### **Session Chair**

SIAM Conference PD25

Pittsburgh, PA

Nov 2025

- Selected to serve as chair for Contributed Presentation Session 9

### **Delegate, Student Advisory Committee**

Yale University, Department of Mathematics

New Haven, CT

Feb 2024 – Apr 2025

- Elected by students across mathematics-related majors to bridge the gap between students and faculty
- Advocated in particular for the needs of first-generation and marginalized students at biweekly meetings

### **Undergraduate Peer Mentor**

Yale Undergraduate Mathematics Society

New Haven, CT

Aug 2023 – Apr 2025

- Mentor first-year students interested in studying mathematics, especially other first-generation students
- Engage with Yale's broader mathematics community through various events, seminars, and presentations

### **Mathematics Advisor, Academic Fair**

Yale University, Department of Mathematics

New Haven, CT

Aug 2023, Aug 2024, Apr 2025

- Introduced incoming students to Yale's mathematics department, answering questions about courses and the major

### **Cofounder and Vice Chair**

Yale Students for Ranked-Choice Voting

New Haven, CT

Aug 2022 – May 2025

- Mentored students interested in statistical and combinatorial research on ranked-choice voting in New Haven

## **ADDITIONAL ACADEMIC EXPERIENCE**

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### **Independent Study of Lie Theory and Representation Theory**

Yale University, Department of Mathematics

New Haven, CT

Jan 2023 – May 2023

- **Advisor:** Andrew Neitzke

### **Directed Project on Commutative Algebra**

Polymath, Jr. Undergraduate Research Program

Remote

Jun 2022 – Aug 2022

- **Advisor:** Ananthnarayan Hariharan (Indian Institute of Technology, Bombay)

### **Science, Technology, and Research Scholars (STARS) Program**

Yale University, Science and Quantitative Reasoning Center

New Haven, CT

Aug 2021 – May 2022

## **WORKSHOPS**

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### **Mathematics REU Panel** (Invited panelist)

Yale Undergraduate Mathematics Society, Yale University

New Haven, CT

Jan 2024

### **Departmental Town Halls** (Organized and led)

Yale University, Department of Mathematics

New Haven, CT

Apr 2024 and Dec 2024

- Held discussions at two session open for all students to provide feedback for the department, especially regarding its climate and potential structural reforms
- Compiled a report of students' experiences and critiques to share with the Dean of Undergraduate Studies in Mathematics

### **Mathematics Career Panel** (Organized and led)

Yale University, Department of Mathematics

New Haven, CT

Nov 2024

### **Mathematics Graduate School Panel** (Organized)

Yale University, Department of Mathematics

New Haven, CT

Apr 2024

### **Mathematics Course Scheduling and Major Planning Workshop** (Organized and hosted)

Yale University, Department of Mathematics

New Haven, CT

Apr 2024

## **HONORS & GRANTS**

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### **SREB-State Doctoral Scholar**

Southern Regional Education Board

Sep 2025

### **K. Leroy Irvis Fellowship** (\$36,558)

University of Pittsburgh, Office of the Provost

Aug 2025

### **Prospective Ph.D. Preview Program Scholar** (6% acceptance rate)

Princeton University, Graduate School Deans and Administration

Aug 2024

<b>Delta Alpha Pi Honor Society</b> (Founding member of Yale chapter) Yale University	Jan 2023 – May 2025
<b>Richter Summer Fellowship</b> (\$1,500) Paul K. Richter and Evalyn E. Cook Richter Memorial Fund	Jun 2023
<b>International Study Award</b> (\$3,400) Yale University	Jun 2023
<b>Summer Experience Award</b> (\$4,000) Yale University	May 2022
<b>Winston T. Townsend Prize for Excellence in English Composition</b> (\$1,000) Yale University, Department of English	May 2022

## PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

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- American Mathematical Society (AMS)
- Center for Minorities in the Mathematical Sciences (CMMS)
- Out in Science, Technology, Engineering, and Mathematics (oSTEM)
- Sines of Disability
- Spectra, the Association for LGBTQ+ Mathematicians

## SKILLS

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- **Programming languages:** Python, Java, R, HTML, CSS, JavaScript, Wolfram Language
- **Other software:**  $\text{\LaTeX}$ , PGF/TikZ, GAP, Mathematica, Singular, KnotPlot, Jupyter Notebook, Git, Logger Pro, Adobe Creative Cloud
- **Human languages:** American Sign Language (advanced), Spanish (intermediate), Vietnamese (conversational), Italian (reading only)