Shiyue Li

Department of Mathematics, Brown University
151 Thayer Street, Providence, RI 02912, USA

Research Interests Combinatorial algebraic geometry: tropical geometry, moduli spaces of curves, Schubert calculus, geometric models and invariants of matroids.

Education

Brown University. Providence, RI.
Ph.D. in Mathematics.   2019-Present
M.Sc. in Mathematics.   May 2022
Advisor: Melody Chan.

Yale University. New Haven, CT.
M.Sc. in Mathematics. Lang Fellow.   May 2019

Harvey Mudd College. Claremont, CA.
B.Sc. in Mathematics, with Distinction and Honors.   May 2017
HSA Concentration in Music.
Thesis: *Tropical derivation of cohomology ring of heavy/light Hassett spaces.*

Publications & Preprints

7. **Wonderful compactifications and rational curves with cyclic action**   2022
   with Emily Clader, Chiara Damiolini, Rohini Ramadas,
   arxiv 2208.05463.

6. **Equivariant log-concavity of graph matchings**   2022
   arxiv 2202.08828.

5. **Intersecting ψ-classes on $M_{0,w}^{\mathrm{trop}}$**   2021
   with Marvin Anas Hahn,
   arXiv 2108.00875.

4. **Polyhedral complexes and rational curves with cyclic action**   2021
   with Emily Clader, Chiara Damiolini, Daoji Huang, Rohini Ramadas,
   arXiv 2104.06526.

3. **Relative Bott-Samelson varieties**   2020
   arXiv 2011.04814.

2. **Topology of tropical moduli spaces of weighted stable curves in higher genus**   2020
   with Siddarth Kannan, Stefano Serpente, Claudia Yun.
   arXiv 2010.11767. To appear in *Advances in Geometry*.

1. **Chow ring of heavy/light Hassett spaces via tropical geometry**   2019
   with Siddarth Kannan, Dagan Karp.
   Journal of Combinatorial Theory, Series A. 178C (2021) 105348.

Awards & Fellowships

Coline M. Makepeace Fellowship at Brown	2021-2022
Robert Willets Carle Scholarship at Yale	2018-2019
Kenneth and Mary Wang Fellowship at Yale	2017-2018
Lang Fellowship at Yale	2017-2018
Harvey S. Mudd Merit Award	2013-2017
Yu Yuen Kit So International Scholarship at Harvey Mudd	2013-2017
Dean's List at Harvey Mudd (all semesters)	2013-2017

	China National Linguistics Olympiad 3rd Place	2013
	China National Linguistics Olympiad Team 2nd Place	2013
Invited Talks	Harvard-MIT Combinatorics Seminar, Harvard University	Oct 2022
	AMS Special on Combinatorial Algebraic Geometry, UMass Amherst	Oct 2022
	AWM Research Symposium, University of Minnesota	Jun 2022
	RATCOW, University of Oregon	Jun 2022
	BATMOBILE, Brown University	May 2022
	Combinatorial and Nonlinear Day, Brown University	Apr 2022
	Joint Mathematics Meetings AWM Special Session	Apr 2022
	Canadian Math Society: Combinatorics and Geometry of Moduli Spaces	Dec 2021
	Front Range Algebraic Geometry and Number Theory	Sep 2021
	SIAM Conference on Applied Algebraic Geometry	Aug 2021
	Moduli Across the Pandemic	Apr 2021
	Tropical Geometry in Frankfurt (TGiF) Seminar	Apr 2021
	AMS Spring Eastern Sectional Meeting on Moduli of Curves	Mar 2021
	Algebra Seminar, Brown	Nov 2020
	American Graduate Student Algebraic Geometry Seminar	Oct 2020
	AMS Spring Eastern Sectional Meeting on Moduli of Curves (cancelled)	Mar 2020
Outreach Talks	Summer Undergrad Math Research at Yale (SUMRY) Colloquium	Jul 2020
	Johns Hopkins Center for Talented Youth Colloquium	Mar 2020
	Yale Undegraduate Mathematics Society (YUMS) Colloquium	Nov 2019
	Department Undergrad Group (DUG) Colloquium at Brown	Oct 2019

Scienticfic Professional Positions

Google Research, Mountain View, CA — Summer 2016
Mentors: Caroline Pantofaru, Malcolm Slaney.
Designed pipelines and algorithms using deep learning models and computer vision techniques on synchronized audio and video signals to solve a saliency detection problem.

Howard Hughes Medical Institute, Pomona, CA — Summer 2014
Mentors: Blerta Shtylla.
Mathematical modeling on parA and parB proteins in bacterial DNA segregation.

Summer Science Program, Socorro, NM — Summer 2012
Research on orbit determination of solar-system body. Implemented programs in Python using iterative Gaussian method to determine the orbit elements based on the observation data of Asteroid 1998QS52 in Etscorn Observatory.
Paper and results archived in Harvard-Smithsonian Center for Astrophysics.

Teaching

Sherdian Teaching Certificate I — Fall 2021

Brown University, Providence, RI
Math 100 Introductory Calculus, Part II, TA — Spring 2022
Math 100 Introductory Calculus, Part II, TA — Spring 2021
Math 100 Introductory Calculus, Part II, TA — Fall 2020

Canada/USA Mathcamp 2019, Portland, OR — Summer 2019
Introduction to Group Theory
Young tableaux and Representation Theory
Young tableaux and Combinatorics
Young tabelaux and Probability

Canada/USA Mathcamp 2018, Golden, CO　　　　　　　　　　　Summer 2018
Algebraic Number Theory
Geometric Group Theory
Modular Forms
Tropical Plane Curves
Rational Points on Elliptic Curves

Yale University, New Haven, CT
Math 225 Linear Algebra and Matrix Theory, TA　　　　　　　　Fall 2018
Math 112 Calculus, TA　　　　　　　　　　　　　　　　　　　Spring 2018

Mentoring	Summer Undergraduate Math Research at Yale

Summer Undergraduate Math Research at Yale
   1. Topological zeta functions of matroids　　　　　　　　Summer 2020
     Co-mentor: Max Kutler.
     Mentees: Dawit Mengesha, Robert Miranda, Brian Sun.

Canada/USA Mathcamp Projects
   1. Research project.　　　　　　　　　　　　　　　　Summer 2019
     Mentee: Ilaria Seigal.

   2. Schubert calculus.　　　　　　　　　　　　　　　　Summer 2019
     Mentees: Alice Jenkins, Jeremy Zhou.

   3. Primes of the form $x^2 + ny^2$.　　　　　　　　　　Summer 2018
     Mentee: Reed Jacobs.

   4. Enumerative geometry.　　　　　　　　　　　　　　Summer 2018
     Mentees: Simran Khunger, Rupert Li.

   5. Group actions and Sylow's theorems.　　　　　　　　Summer 2018
     Mentees: Serena An.

Brown Mathematics Directed Reading Program.
   1. Ideals, Varieties and Algorithms.　　　　　　　　　　Fall 2020
     Mentees: Deven Carmichael, Joseph Hlavinka.

   2. Foundations of Algebraic Geometry.　　　　　　　　Spring 2020
     Mentees: Dominick Joo, Elliott Lehrer, Joshua Lebo.

Women in Sciences at Yale.
   1. Mentee: Alara Değirmenci.　　　　　　　　　　　　Fall 2018

Professional Service	*Brown Horizons Seminar*, Organizer	2021-2022
	American Mathematics Society Student Chapter at Brown, Chair	2019-2021
	Brown Math Diversity and Inclusiveness Committee, Member	2019-2020
	Brown University ACCRIP, Graduate Representative	2019-2020
	AMS Graduate Conferences, Organizer	2020
	Brown Math Directed Reading Program, Organizer	2019-2020
	Yale University Womxn in Mathematics (Intersections), Co-organizer	2018
	Yale Math Directed Reading Program, Organizer	2018
	Yale Graduate and Professional Student Senate, Senator	2017-2018
	Harvey Mudd College Math Club, President	2016-2017
	Caltech-Harvey Mudd Math Competition, Organizer	2015-2016

Languages	Mandarin Chinese (Native), English (Bilingual), French (Conversational).