

Contact

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Research Interests

Real Algebraic Geometry, Tensor Decomposition, Algebraic Statistics, Non-convex Optimization

Education

- *University of California, Berkeley*, 2018 - present
PhD candidate in Mathematics
Advisor: David Nadler
- *University of California, Irvine*, 2016 - 2018
Bachelor of Science Honors in Mathematics
Advisor: Vladimir Baranovsky

Preprints

- "Sign patterns of principal minors of real symmetric matrices," Tobias Boege, Jesse Selover, and Maksym Zubkov
- "Topology of Principally Regular Symmetric Matrices," Maksym Zubkov

Publications

- "Likelihood Geometry of Determinantal Point Processes", Hannah Friedman, Bernd Sturmfels, and Maksym Zubkov, Algebraic Statistics 15.1 (2024): 15-25, <https://arxiv.org/abs/2307.13486>
- "Chromatic Graph Homology for Brace Algebras", Vladimir Baranovsky and Maksym Zubkov, New York J. Math. 23 (2017): 1307–1319, <https://nyjm.albany.edu/j/2017/23-58p.pdf>

Surveys

- "An Algebraic Case Study of Polynomial Neural Networks", Miles Bikenhus, Maximilian Wiesmann, and Maksym Zubkov, https://drive.google.com/file/d/1KY_Hx4hCO-9-UDfx9BtlmLfVsYn-vGja/view

Honors and Awards

Year	Award	Institution
2024	Coleman Fellowship	UC Berkeley
2020	Outstanding Graduate Student Instructor Award	UC Berkeley
2018	UROP Fellowship	UC Irvine
2017	SURP Fellowship	UC Irvine
2017	Honorary Presenter MAA at MathFest	Chicago

Presentations at Conferences and Workshops

Date	Title	Location
2024 January	"Likelihood Geometry of Determinantal Point Processes"	JMM
2023 Fall	"Polynomial Neural Networks"	IMSI
2018 January	"Chromatic Graph Homology for Brace Algebras"	JMM

Presentations at Seminars

Date	Title	Location
2024 Winter	"Geometry of Deep Polynomial Neural Networks"	UC Berkeley, Math and ML Seminar
2024 Winter	"Geometry of Principally Regular Matrices"	UBC, IAM Seminar
2023 Fall	"Geometry of Principally Regular Matrices"	SFSU, AGC Seminar
2023 Fall	"Polynomial Neural Networks"	UC Berkeley, Computational Math Seminar
2023 Summer	"Topology of the Complement of Determinantal Variety"	Leipzig University
2021 Fall	"Applications of Riemann-Roch theorem"	UC Berkeley, Student Algebraic Curve Seminar
2021 Spring	"Hochschild Homology and differential forms"	UC Irvine, Graduate Algebra Seminar
2019 Fall	"Colored Jones Polynomials"	UC Berkeley, Student Topology Seminar
2019 Spring	"Hyperbolic Dehn Surgeries"	UC Berkeley, Student Topology Seminar
2017 Spring	"Homotopy Algebras: A-infinity, E2, and Brace"	UC Irvine, Graduate Algebra Seminar
2017 Spring	"Preliminaries on Knot Theory: Jones Polynomials and Vassiliev Invariant"	UC Irvine, Undergraduate Math Club

Conferences and Workshops Attended

Date	Title	Location
2024 June	"Tensors: Algebra-Geometry-Applications"	Fort Collins, USA
2024 February	"Tensor Networks"	Los Angeles, USA
2024 January	"Winter Program in Machine Learning"	Austin, USA
2024 January	"Connecting Higher-Order Statistics and Symmetric Tensors"	Providence, USA
2023 Fall	"Apprenticeship Week: Varieties from Statistics"	Chicago, USA
2023 August	"Numbers in the Universe"	Kyiv, Ukraine
2023 July	"SIAM Conference on Applied Algebraic Geometry"	Eindhoven, The Netherlands
2023 June	"Algebraic and topological interplay of algebraic varieties"	Jaca, Spain
2023 June	"Let's get \mathbb{R} al"	Leipzig, Germany
2018 January	"Joint Mathematics Meetings"	San Diego, USA
2017 November	"Field of Dreams Conference"	St. Louis, USA
2017 August	"Interactions between Representation Theory and Algebraic Geometry"	Chicago, USA
2017 July	"MAA MathFest Conference"	Chicago, USA

Teaching Experience

Date	Role	Course	University
2021 Summer	Lecturer	Math 53: Multivariable Calculus	UC Berkeley
2019 Summer	Lecturer	Math 53: Multivariable Calculus	UC Berkeley
2023 Fall	Graduate Student Instructor	Math 16A: Calculus	UC Berkeley
2023 Spring	Graduate Student Instructor	Math 16A: Calculus	UC Berkeley
2021 Fall	Graduate Student Instructor	Math 16B: Calculus	UC Berkeley
2021 Spring	Graduate Student Instructor	Math 16B: Calculus	UC Berkeley
2020 Fall	Graduate Student Instructor	Math 32: Precalculus	UC Berkeley
2020 Spring	Graduate Student Instructor	Math 32: Precalculus	UC Berkeley
2019 Fall	Graduate Student Instructor	Math 53: Multivariable Calculus	UC Berkeley
2018 Spring	Graduate Student Instructor	Math 53: Multivariable Calculus	UC Berkeley
2018 Fall	Graduate Student Instructor	Math 53: Multivariable Calculus	UC Berkeley
2018 Spring	Supplemental Math Instructor	Math 2D: Multivariable Calculus	UC Irvine
2018 Winter	Supplemental Math Instructor	Math 2D: Multivariable Calculus	UC Irvine
2017 Fall	Supplemental Math Instructor	Math 2D: Multivariable Calculus	UC Irvine
2017 Summer	Supplemental Math Instructor	Math 2B: Integral Calculus	UC Irvine
2017 Summer	Supplemental Math Instructor	Math 2A: Differential Calculus	UC Irvine
2017 Spring	Supplemental Math Instructor	Math 2D: Multivariable Calculus	UC Irvine
2016 Spring	Supplemental CS Instructor	Introduction to C/C++	Los Angeles Pierce College

Skills

- Programming skills: Python, C/C++, Mathematica, Julia
- Languages: Fluent in Russian and Ukrainian

Service and Outreach

- MathForLife: Math Educational channel, YouTube, 2017 - present
- Math Circle Instructor, UC Irvine, 2017 - 2018
- Direct Reading Program, UC Berkeley, 2020, 2021