

EDUCATION

- **University of California, Davis** Davis, CA
Ph.D. in Mathematics; Advisor: Jesús De Loera Sep 2020 - 2025 (expected)
- **University of California, Davis** Davis, CA
M.A. in Mathematics Dec 2022
- **National Autonomous University of Mexico** Mexico City, Mexico
B.Sc. in Mathematics July 2020
Graduated with honors, Thesis: "A proof of the Upper Bound Theorem"

PUBLICATIONS

1. *Markov bases: a 25 year update* (with J. A. De Loera and S. Petrović), *Journal of the American Statistical Association*, 2024. Available [here](#).
2. *Irreducible Markov Chains on spaces of graphs with fixed degree-color sequences* (with J. A. De Loera and S. Petrović). Preprint available on [arXiv:2402.09568](https://arxiv.org/abs/2402.09568)

PROFESSIONAL EXPERIENCE

- **University of California, Davis** Davis, CA
Graduate Student Researcher Jul 2021 - Currently
 - Have conducted research on: algebraic statistics, applied polyhedral geometry and combinatorics.
- **University of California, Davis** Davis, CA
Teaching Assistant Sep 2020 - Currently
 - Held weekly discussions, office hours, prepared material, graded quizzes, homework and exams for the following classes: Calculus for BioSci, Probability, Intro to abstract math and Modern algebra
- **Colombian Combinatorics Meetings (ECCO)** Bogotá, Colombia
Teaching Assistant June 2022
 - Prepared problem sessions for a course on "Helly, Carathéodory, Tverberg: Three powerful theorems of Combinatorial Convex Geometry and their applications" thought by Prof. Jesús A. De Loera
- **Breakthrough (a U.S. Venture Company)** Green Bay, WI
Data Analytics Engineer Intern June-Sep 2023, 2024
 - Breakthrough is a strategic transportation partner empowering shippers with data, technology, and market knowledge to reduce cost, create fair partnerships, and improve transportation network efficiency and sustainability. I worked as a data analytics engineer on the backend data engineering team.

PRESENTATIONS

- **Universality of the no-three-way Interaction Model**
 - Perfect Fit Seminar at Algebraic Statistics and Our Changing World program, Institute for Mathematical and Statistical Innovation, Chicago, November 2023
- **Markov basis for Exponential Random Graph Models**
 - Special session on "Mathematics in Data Science" at the AMS Sectional Meeting, Cal State Fresno, Fresno, May 2023

- **Algebraic Methods in Statistics: an Exploration of Markov bases**
 - Nonlinear Algebra and Statistics Seminar, Illinois Institute of Technology, Chicago, April 2023
- **Gröbner basis and color-balanced walks**, poster presented at:
 - Algebraic Statistics Conference, University of Hawai'i at Manoa, Hawai'i, May 2022
 - Colombian Combinatorics Meeting (ECCO), Universidad de los Andes, Bogotá, June 2022
 - Combinatorial, Computational, and Applied Algebraic Geometry, University of Washington, Seattle, July 2022

WORKSHOPS AND STAYS

- Data Science Bootcamp (Awarded Top Project), Erdős Institute, 2024
- Algebraic Statistics and Our Changing World program: Workshops in Algebraic Economics and Bayesian Statistics, IMSI, 2023
- Current Themes of Discrete Optimization: Boot-camp for early-career researchers, ICERM, 2023
- MSRI Graduate School in Geometric Group Theory, Casa Matemática Oaxaca, 2019
- II Workshop in knots, braids and algebras, Institute of Mathematics UNAM, 2019
- Summer Graduate studies at IMPA (coursed: Markov Chains), Río de Janeiro, 2019
- II Summer School in Symmetry of Combinatorial Structures, Institute of Mathematics UNAM, 2017

AWARDS

- Second prize XV International Mathematics Competition for university students, Blagoevgrad 2018
- Silver medal XXVII Mexican Mathematical Olympiad, Toluca 2014
- Third place XVII National Contest in Mathematics A.N. Kolmogorov, 2015

FUNDING

My research has been partially supported by the following NSF grants.

- A Two-Way Research Street: Geometric Algorithms in Optimization and Computer-Based Discrete Geometry, 2022-2023
- HDR TRIPODS: UC Davis TETRAPODS Institute of Data Science, 2023

SKILLS

- **Programming languages:** Python, R, SQL, LaTeX, SageMath, Macaulay2, 4ti2
- **Technologies:** git, dbt, BigQuery