Dominic Arcona

Department of Mathematics, USC
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Education

Ph.D. Applied Mathematics, University of Southern California, Expected May 2026.
- Advisor: Jason Fulman.
- Dissertation Topic: Limiting distributions of cycle types in permutations arising from shuffling.

M.S. Statistics, USC, Requirements completed Dec 2024.

B.A. Mathematics, Chemistry, Dartmouth College, 2019.

Publications

Submitted:
- *Representation theory and cycle statistics for random walks on the symmetric group*, 2025. arXiv URL: https://arxiv.org/abs/2512.13969
- *Tensor powers of virtual S_n representations encoding permutation cycle type statistics*, FPSAC 2026 Extended Abstract

Selected Presentations

- **USC Combinatorics Seminar**, Fall 2025 — *Cycle Statistics of Nonuniform Permutations*
- **Graduate Student Combinatorics Conference**, Spring 2025 — *Fixed Points after Star Transposition Shuffling*
- **USC Graduate Student Colloquium**, Spring 2024 — *Limit Profiles of Reversible Markov Chains*

Teaching Experience

Teaching Assistant, USC
- Probability Theory (Spring 2025, Dennis Ray Estes Teaching Award)
- Calculus I (Fall 2024)
- Linear Algebra (Spring 2024)
- Calculus III (Fall 2023)
- Foundations of Statistics (Fall 2022)
- Business Calculus (Summer 2025, Fall 2021)

Independent Tutor
- Econometrics (Summer 2025)
- Macroeconomics (Spring 2024)
- Mechanics, Electricity, and Magnetism (Spring 2023)
- Calculus (2015-2021)
- Precalculus (2012-2021)

Industry Experience

Consultant, AQN Strategies (2019-2020)
- Advised a top-5 international bank on pricing and fraud risk management strategies for a SME loan product.

Analytics Consultant, Voyatek (2020-2024)
- Large US state Department of Revenue (DOR) sought effective discovery and prioritization of 'Remote Seller' businesses selling physical products to in-state consumers for the purpose of collecting sales tax revenue.
- Developed and tuned regression models in Python to effectively prioritize leads based on predicted annual gross revenue.
- Generated $1M monthly in voluntary tax remittance for DOR client through quarterly mail correspondence campaigns. Team received a company-wide Outcome Award for this achievement, which also led to the company securing multiple new (lucrative, long-term) contracts for follow-on work.

Honors and Awards

- **American Chemical Society (ACS) 4-Year Scholarship**, Dartmouth College, 2015–2019.
- **John L. Zabriskie Research Prize**, 2019.
- **Voyatek Outcome Award**, 2024.
- **USC Mathematics Department Research Award Nominee**, 2025.
- **Dennis Ray Estes Teaching Award**, 2025.

Service

- **Graduate Combinatorics Conference**, Organizer, 2025.
- **USC Math Graduate Student Association**, Graduate student mentor, 2023-2025.
- **USC Math Graduate Student Association**, Ski Captain, 2022-2025.

References

Jason Fulman — Professor of Mathematics, USC
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Sami Assaf — Professor of Mathematics, USC
Email: sassaf@usc.edu

Greta Panova — Professor of Mathematics, USC
Email: gpanova@usc.edu

Richard Arratia — Professor of Mathematics, USC
Email: rarratia@usc.edu

Cymra Haskell — Professor (Teaching) of Mathematics, USC
Email: chaskell@usc.edu