Benjamin Fineman

Education

2012 **Ph.D. in Mathematics**, *University of California, Davis*, Davis, CA.

2005 **B.A. in Mathematics**, *Haverford College*, Haverford, PA.
Graduated with honors in Mathematics.

Publications and Projects

2016 **Kaggle Competition - Airbnb New User Bookings - top 10%**.
(92nd out of 1463 participants) https://www.kaggle.com/ben07824.

2015 **Kaggle Competition - Walmart Trip Type Classification - top 10%**.
(81st out of 1047 participants) .

2015 **Publication** - *A viewpoint for permutations with a low density of patterns*, Journal of Combinatorics, 2015, **6(1-2)**, 103–115 publication link.

2015 **Publication** - (with Erik Slivken) *Permutations close to the diagonal*, in preparation.

2015 **Project** - Used python to implement the bijection of Backelin, West, and Xin, between pattern avoiding permutations, which has been useful for research and presentations. https://github.com/ben07824/BWX-bijection.

Technical Skills and Data Science Training

Python (Scikit-learn, Pandas, NumPy, SciPy, and Seaborn), Neural Networks (Theano, Lasagne, nolearn), Sage, Mathematica, MATLAB, LaTeX, SQL.

Machine Learning, Andrew Ng (Coursera).

Introduction to Data Science, Bill Howe (Coursera, self-study).

Harvard CS109 Data Science (self-study).

Work Experience

2015-Present **Tenure Track Mathematics Faculty**, *Mission College*, Santa Clara, CA.
Taught classes from the entire Mathematics curriculum, including Statistics, Finite Math, and Calculus for Business

2012-2015 **Lecturer, Department of Mathematics**, *University of California, Davis*, Davis, CA.
Taught one or more undergraduate courses each quarter, including Combinatorics; Calculus for Biology; Differential, Integral, and Multivariate Calculus; and Vector Analysis

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2005-2012 **Teaching Assistant, Department of Mathematics**, *University of California, Davis*, Davis, CA.

Served as a teaching assistant for numerous classes including: Linear Algebra, Probability, Calculus, Number Theory, Enumerative Combinatorics, Algebraic Combinatorics, and Analysis.

2005 **Research Assistant, Department of Mathematics**, *Haverford College*, Haverford, PA.

Wrote code to implement combinatorial calculations used in research.

Presentations and Invited Talks

2015 **Invited Talk**, *Quantitative Scientific Solutions, LLC, Washington DC*.

"Current results and areas of interest in the field of permutation patterns."

2015 **Mathematics and Statistics Colloquium**, *University of Nevada, Reno*.

"The shape of monotone and skew-monotone pattern avoiding permutations."

2015 **Mathematical Physics and Probability Seminar**, *UC Davis*.

"The shape of monotone and skew-monotone pattern avoiding permutations."

2012 **Permutation Patterns 2012 Conference**, *Glasgow, Scotland*.

"Bounds for the number of permutations with a low density of patterns."

2006-2010 **Student Discrete Math Seminar**, *UC Davis*.

"A probabilistic version of Szemerédi's regularity lemma."

"Szemerédi's regularity lemma."

"Pattern avoiding permutations."

"The probabilistic method."

"Graphs and homomorphisms."

"An introduction to skyline augmented fillings."

"A canonical form of polyhedra with applications to integer programming."

Interests

Research Interests: Probabilistic and extremal combinatorics, graph theory, and probability. In particular, permutation patterns, the probabilistic method, and graph/hypergraph regularity.

Teaching Interests: Probability/statistics, discrete math, enumerative and algebraic combinatorics, and number theory

Piano: Avid piano player for many years.

Cycling: Member of the UC Davis Cycling team from 2005-2009.

Service: **Director of the Cal Aggie Criterium**, *2008-09*, Davis, CA.

Organized a bicycle race in downtown Sacramento, which involved securing permits and insurance, directing volunteers, coordinating with referees, and various other tasks.