

Jay Pantone

✉ jay.pantone@gmail.com • 🌐 jaypantone.com

Research Area

My research is focused on the development and application of analytic and computational methods to enumerative combinatorics and statistical mechanics. My enumerative work has included a broad range of combinatorial topics, such as pattern-avoiding permutations, the square-lattice Ising model, chord diagrams, generalized Fibonacci hypercubes, and more.

Education

University of Florida

PhD, Mathematics (2015), Advisor: Vincent Vatter
MS, Mathematics (2013)

Gainesville, FL

2011 – 2015

University of Florida

BS, Mathematics, Computer Science

Gainesville, FL

2007 – 2011

Appointments

Dartmouth College

John Wesley Young Research Instructor

○ Postdoctoral research and teaching position

Hanover, NH

July 2015 – present

Publications (chronologically, by date of completion)

- [1] Fidler, J., Glasscock, D., Miceli, B., Pantone, J., and Xu, M. Shift equivalence in the generalized factor order. arXiv:1612.09003 [math.CO].
- [2] Albert, M. H., Pantone, J., and Vatter, V. On the growth of merges and staircases of permutation classes. arXiv:1608.06969 [math.CO].
- [3] Guttman, A. J., Jensen, I., Maillard, J.-M., and Pantone, J. Is the full susceptibility of the square-lattice Ising model a differentially algebraic function? *J. Phys. A* 49.50 (2016), p. 504002.
- [4] Pantone, J. The asymptotic number of simple singular vector tuples of a cubical tensor. *Online J. Anal. Comb. (to appear)* (2016). arXiv:1605.06099 [math.CO].
- [5] Pantone, J. and Vatter, V. Growth rates of permutation classes: categorization up to the uncountability threshold. arXiv:1605.04289 [math.CO].
- [6] Bevan, D., Levin, D., Nugent, P., Pantone, J., Pudwell, L., Riehl, M., and Tlachac, M. Pattern avoidance in forests of binary shrubs. *Discrete Math. Theor. Comput. Sci.* (2016).
- [7] Albert, M. H., Homberger, C., Pantone, J., Shar, N., and Vatter, V. Generating permutations with restricted containers. arXiv:1510.00269 [math.CO].
- [8] Bóna, M., Homberger, C., Pantone, J., and Vatter, V. Pattern-avoiding involutions: exact and asymptotic enumeration. *Australas. J. Combin.* 64.1 (2016), pp. 88–119.
- [9] Albert, M. H., Atkinson, M. D., Homberger, C., and Pantone, J. Deflatibility of permutation classes. *Australas. J. Combin.* 64.1 (2016), pp. 252–276.
- [10] Azarija, J., Klavžar, S., Lee, J., Pantone, J., and Rho, Y. On isomorphism classes of generalized Fibonacci cubes. *European J. Combin.* 51 (2016), pp. 372–379.
- [11] Burstein, A. and Pantone, J. Two examples of unbalanced Wilf-equivalence. *J. Comb.* 6.1-2 (2015), pp. 55–67.
- [12] Albert, M., Homberger, C., and Pantone, J. Equipopularity classes in the separable permutations. *Electron. J. Combin.* 22.2 (2015), Paper 2.2, 18.
- [13] Pantone, J. The enumeration of permutations avoiding 3124 and 4312. *Ann. Comb. (to appear)* (2016).
- [14] Pantone, J. and Vatter, V. On the Rearrangement Conjecture for generalized factor order over \mathbb{P} . In: *26th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2014)*. Discrete Math. Theor. Comput. Sci. Proc., AT. Assoc. Discrete Math. Theor. Comput. Sci., Nancy, 2014, pp. 217–228.

Grants and Awards

National Science Foundation

East Asia and Pacific Summer Institutes, Award #1514825

June 2015 – August 2015

- Joint program with the National Science Foundation and the Australian Academy of Science

Conference Travel Grants and Funding

- Conference and seminar travel grants awarded by: University of Florida Department of Mathematics, University of Florida Office of Research, University of Florida Center for Applied Mathematics, University of Florida College of Liberal Arts and Sciences, University of Florida Graduate Student Council, *Permutation Patterns 2013*, FPSAC 2013, American Mathematical Society, *Permutation Patterns 2014*, Dartmouth College Department of Mathematics, Leibniz Center for Informatics, *Permutation Patterns 2016*, Mathematical Sciences Research Institute (on behalf of Banff International Research Station)

Visiting Positions

University of Melbourne

Melbourne, Australia

June 2015 – August 2015

- Received grant from the National Science Foundation and the Australian Academy of Science to collaborate with Tony Guttmann
- Resulted in one submitted paper, ongoing projects, and forthcoming journal articles and software packages

University of Otago

Dunedin, New Zealand

March 2014 – May 2014

- Collaborated with Michael Albert and Mike Atkinson
- Resulted in two published research papers and ongoing collaboration

Scholarly Activities

Conference Organizer

- *Permutation Patterns 2016* (Washington, D.C.), Scientific Committee
- Special Session on Enumerative Combinatorics (2015, AMS-MAA Joint Meetings), Principal Organizer
- *Bijjective and Algebraic Combinatorics* (2014), Committee Member

Editorial Duties

- Online Encyclopedia of Integer Sequences, Associate Editor
- *Discrete Mathematics and Theoretical Computer Science*, Guest Editor for *Permutation Patterns 2016* special issue

Journal Referee

Advances in Applied Mathematics, Discrete Applied Mathematics, Discrete Mathematics, Discrete Mathematics and Theoretical Computer Science, Electronic Journal of Combinatorics, European Journal of Combinatorics, Journal of Combinatorics, Theory of Computing Systems

AMS Mathematical Reviews – 5 reviews written

Department Service

Combinatorics Seminar Organizer

Dartmouth College

2015 – present

Invited Talks

On the Growth of Merges and Staircases of Permutation Classes

AMS Section Meeting – Minneapolis, Minnesota

October 2016

Sorting with \mathcal{C} -machines: Enumerative and Analytic Aspects

Banff International Research Station – Banff, Canada

October 2016

Approximate Asymptotic Analysis of Combinatorial Sequences

Rutgers Experimental Mathematics Seminar

October 2016

Exact and Asymptotic Analysis of Combinatorial Sequences

Dartmouth College Mathematics Colloquium

May 2016

The Method of Differential Approximants

Leibniz Center for Informatics – Warden, Germany

February 2016

The Method of Differential Approximants

AMS Section Meeting – Chicago, Illinois

October 2015

Sorting with C-Machines <i>University of Melbourne Statistical Mechanics Seminar</i>	July 2015
Equivalence of Words in the Generalized Factor Order <i>AMS Section Meeting – Washington, D.C.</i>	March 2015
Equipopularity in the Separable Permutations <i>AMS Section Meeting – Eau Claire, Wisconsin</i>	September 2014

Other Talks

Growth Rates of Permutation Classes <i>Permutation Patterns 2016 – Washington, D.C.</i>	June 2016
Sorting with C-Machines <i>University of Florida Combinatorics Seminar</i>	December 2015
Sorting with C-Machines <i>Dartmouth College Combinatorics Seminar</i>	October 2015
Pattern-Avoiding Involutions: Exact and Asymptotic Enumeration <i>Permutation Patterns 2014 – Johnson City, Tennessee</i>	July 2014
The Rearrangement Conjecture , poster <i>Formal Power Series and Algebraic Combinatorics 2014 – Chicago, Illinois</i>	July 2014
Introduction to LaTeX, parts 1 and 2 <i>University of Florida LaTeX Seminar</i>	March 2014
Checker Jumping, Coin Counting, and Cap Throwing: Why Generating Functions are Magic! <i>University of Florida Graduate Student Colloquium</i>	August 2013
The Enumeration of Permutations Avoiding the Patterns 3124 and 4312 <i>Permutation Patterns 2013 – Paris, France</i>	July 2013
Enumeration of the Area Under Lattice Paths <i>University of Florida Combinatorics Seminar</i>	November 2012
The History of π <i>University of Florida Pi Mu Epsilon Seminar</i>	March 2012

Teaching Experience

Instructor, Dartmouth College	
<i>Math 28 – Combinatorics</i>	Winter 2017
<i>Math 13 – Multivariable Calculus</i>	Fall 2016
<i>Math 22 – Linear Algebra with Applications</i>	Spring 2016
<i>Math 118 – Graduate Combinatorics</i>	Winter 2016
○ Special topics course on the symbolic method and analytic combinatorics, designed from scratch	
<i>Math 11 – Multivariable Calculus for Freshmen</i>	Fall 2015
Instructor, University of Florida	
<i>MAP 2302 – Differential Equations</i>	Summer 2015
<i>MAC 2233 – Survey of Calculus 1</i>	Summer 2014
<i>MAC 1147 – Precalculus with Trigonometry</i>	Summer 2012
Teaching Assistant, University of Florida	
<i>Precalculus, Calculus 1, Calculus 2, Calculus 3</i>	2011 – 2015

Computer Skills

- Extensive programming experience with Python, PHP, Java, and C++
- Co-authored Python library for handling large datasets of permutations: <http://permpy.com>
- Extensive mathematical computing experience with Maple, SAGE, GAP, and Singular
- Extensive web development experience with PHP, Apache, MySQL, and Javascript