Justin M. Troyka

Curriculum Vitae

York University
Department of Mathematics and Statistics
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ACADEMIC POSITIONS

Postdoctoral Visitor at York University, Toronto, ON — July 2018–present
Supervisor: Neal Madras

EDUCATION

PhD in Mathematics, Dartmouth College, Hanover, NH — June 2018
Advisor: Sergi Elizalde
Area: Enumerative and algebraic combinatorics
Thesis: *Permutations: Descents, cycles, and patterns*

AM in Mathematics, Dartmouth College, Hanover, NH — November 2014

BA in Mathematics, Carleton College, Northfield, MN — June 2013
Summa cum laude, Phi Beta Kappa

PUBLICATIONS

Split graphs: Combinatorial species and asymptotics, *Electron. J. Combin.* **26**: #P2.42. — 2019

On the centrosymmetric permutations in a class, *Australas. J. Combin.* **74**: 423–442. — 2019

Exact and asymptotic enumeration of cyclic permutations according to descent set, with S. Elizalde, *J. Combin. Theory Ser. A* **165**: 360–391. — 2019

Restricted symmetric signed permutations, with A. Hardt, *Pure Math. Appl.* **23**: 179–217. — 2012

UNPUBLISHED PAPERS AND WORK IN PROGRESS

Bounded affine permutations: I. Pattern avoidance and enumeration, with N. Madras, arXiv:2003.00267, submitted for publication. — 2020

Period mimicry: A note on the (-1)-evaluation of the peak polynomials, arXiv:1907.06681. — 2019

Combinatorial species and graph enumeration (undergraduate senior thesis), with A. Hardt, P. McNeely, & T. Phan, arXiv:1312.0542. — 2013
A concise expository introduction to the theory of combinatorial species.

AWARDS

NSF Graduate Research Fellowship Program: Honorable Mention 2015
A national achievement, awarded according to the NSF Merit Review Criteria of Intellectual Merit and Broader Impacts.

PRESENTATIONS

* *Invited*

*York University Algebraic Combinatorics Seminar February 2020
Foulkes' Conjecture and its generalizations

*Rochester Institute of Technology Discrete and Computational Math. Sem. January 2020
Split graphs: Combinatorial species and asymptotics

Joint Mathematics Meetings AMS Contributed Paper January 2020
Split graphs: Combinatorial species and asymptotics

*York University Discrete Mathematics Seminar December 2019
The cycle lemma

*AMS Sectional Meeting Special Session on Patterns in Permutations November 2019
Pattern-avoiding affine permutations

*York University Applied Algebra Seminar October 2019
Combinatorial species and counting split graphs

Permutation Patterns Conference, University of Zürich June 2019
Classes of sum-decomposable affine permutations

*College at Brockport, State University of New York, Combinatorics Seminar May 2019
Split graphs: Combinatorial species and asymptotics

*York University Applied Algebra Seminar February 2019
Exact and asymptotic enumeration of cyclic permutations according to descent set

*York University Discrete Mathematics Seminar October 2018
Permutation patterns

Formal Power Series and Algebraic Combinatorics, Dartmouth College July 2018
The number of cycles with a given descent set (poster)

Permutation Patterns Conference, Dartmouth College July 2018
Thresholds of growth rates of sum-closed classes

Joint Mathematics Meetings AMS Contributed Paper January 2018
Exact and asymptotic enumeration of cyclic permutations according to descent set

*Dartmouth College Combinatorics Seminar November 2017
Combinatorial proofs of power-series identities

Permutation Patterns Conference, Reykjavík University June 2017
On the growth rate of the centrosymmetric permutations in a class

Graduate Student Combinatorics Conference, University of Kansas April 2017
Exact and asymptotic enumeration of classes of centrosymmetric permutations

*Brandeis University Combinatorics Seminar November 2016
Exact and asymptotic enumeration of cycles according to descent set

Summer Combo in Vermont, Saint Michael's College July 2016
Exact and asymptotic enumeration of cycles according to descent set

Permutation Patterns Conference, Howard University June 2016
Exact and asymptotic enumeration of cycles according to descent set

Graduate Student Combinatorics Conference, Clemson University April 2016
Exact and asymptotic enumeration of cycles according to descent set

*Dartmouth College Combinatorics Seminar March 2016
Exact and asymptotic enumeration of cycles according to descent set

OTHER ACADEMIC ACTIVITIES

Discrete Mathematics Seminar: organized a biweekly research seminar at York University. 2019–2020

Respect, Equity, Diversity and Inclusion — Certificate of Completion: attended a series of four workshops offered by the Centre for Human Rights, Equity, and Inclusion at York University, on topics including sexual harassment and racism. 2019

TA Training Session: co-organized and co-presented a one-day program for graders and tutors at York University. 2019

Canadian Open Mathematics Challenge: Graded solutions from a high-school mathematics competition, helped with scanning and data entry. 2018, 2019

Formal Power Series and Algebraic Combinatorics: assisted in conference organizing at Dartmouth College. 2018

Journal referee: *Discrete Math.*, *Discrete Math. Theor. Comput. Sci.*, *European J. Combin.*, *J. Algebraic Combin.*, *J. Combin.*, *Turkish J. Math.* 2017–2019

Dartmouth College Graduate Student Seminar: frequent speaker (3–4 talks each year). 2013–2018

TEACHING

Instructor, York University 2018–present
Managed and taught each course, wrote homework and exams, supervised graduate-student teaching assistants, used in-class clicker polls to promote active learning in large classes.

`MATH 1300:` Differential calculus with applications Spring 2020
`MATH 1310:` Integral calculus with applications Fall 2019
`MATH 1190:` Introduction to sets and logic Spring 2019
`MATH 1013:` Applied calculus I Fall 2018

Instructor, Dartmouth College 2016–2018
Designed and taught each course, wrote homework and exams, used a combination of group work and conventional teaching.

`MATH 8:` Calculus of functions of one and several variables Winter 2018
`MATH 3:` Introduction to calculus Fall 2016
`MATH 2:` Calculus with algebra and trigonometry Winter 2016

Combinatorics Teaching Assistant, Dartmouth College Fall 2017
Held tutorial sessions once a week, graded homework, was substitute instructor for one week.

`MATH 68:` Algebraic combinatorics

Dartmouth Mathematics Teaching Seminar Summer 2015
An intensive summer-long course in the theory and practice of teaching. Learned and discussed educational philosophies, course design, and classroom techniques; designed and taught two week-long math camps for local middle- and high-school students.

Teaching Assistant, Dartmouth College 2013–2015
Held tutorial sessions three times a week; graded exams.

`MATH 24:` Linear algebra Spring 2015
`MATH 8:` Calculus of functions of one and several variables Fall 2014
`MATH 8:` Calculus of functions of one and several variables Winter 2014
`MATH 11:` Accelerated multivariable calculus Fall 2013

OUTSIDE OF ACADEMIA

In my free time, I am a singer, pianist, and composer. The songs I have written and recorded are available for listening at https://soundcloud.com/justin-troyka/sets/home-solo-recordings. I was in a rock band in college, and I have played trumpet in community and school orchestras.