W. Justin Toth

Contact Information

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Faculty of Mathematics
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Research Interests

Combinatorial Optimization, Algorithmic Game Theory, Approximation Algorithms, Matching Theory, and Polyhedral Combinatorics.

Education

Department of Combinatorics and Optimization, University of Waterloo

Ph.D. Student, Combinatorics and Optimization (expected Fall 2020)

- Advisor: Jochen Könemann

MMath in Combinatorics and Optimization, Dec 2016

- Thesis: Structure in Stable Matching Problems
- Advisor: Jochen Könemann

Department of Mathematics and Statistics, University of Windsor

BMath in Mathematics and Computer Science, May 2015

- Graduate with Great Distinction
- Outstanding Scholar

Certification

Centre for Teaching and Learning, University of Waterloo

Fundamentals of Unversity Teaching Certificate, Dec 2016

- 6 Workshops and 3 Practice Teaching Sessions

Recognitions

2018	2021	NSERC Graduate Scholarship - Doctoral ($21000/year value) University of Waterloo
2018	2021	President's Graduate Scholarship - Doctoral ($10000/year value) University of Waterloo
2015	2016	NSERC Canadian Graduate Scholarship - Masters ($17500 value) University of Waterloo
2015	2016	President's Graduate Scholarship ($5000 value) University of Waterloo
Spring	2013	NSERC Undergraduate Student Research Award ($9000 value) University of Windsor
2011	2015	President's Scholarship ($9000/year value) University of Windsor
2011	2015	Outstanding Scholars Award ($1300/year value) University of Windsor

Employment

Spring	2015	Software Engineer Coop Communications Security Establishment, Ottawa.
2014	2015	Undergraduate Research Assistant in Computational Geometry. Advisor: Asish Mukhopadhyay, School of Computer Science University of Windsor.
Spring	2014	Software Engineer Coop Communications Security Establishment, Ottawa.
2013	2014	Undergraduate Research Assistant in Graph Algorithms. Advisor: Peter Tsin, School of Computer Science University of Windsor.
Spring	2013	NSERC Undergraduate Research Assistant in PDE Computation. Advisor: Ronald Barron, Department of Mathematics University of Windsor.
2012	2013	Undergraduate Research Assistant in PDE Computation. Advisor: Ronald Barron, Department of Mathematics University of Windsor.

Journal Publications

J. Könemann, K. Pashkovich, and J. Toth. Computing the Nucleolus of Matching Games in Polynomial Tiome. *Mathematical Programming*, 1-27 (2020)

J. Könemann, K. Pashkovich, and J. Toth. An Elementary Integrality Proof of Rothblum's Stable Matching Formulation. *Operations Research Letters*, 44.6 :754-756 (2016)

Conference Presentations

A General Framework For Computing the Nucleolus Via Dynamic Programming *Symposium on Algorithmic Game Theory*, University of Augsburg. (Sept 16-18, 2020)

Computing the Nucleolus of Matching Games in Polynomial Time. *Integer Programming and Combinatorial Optimization*, University of Michigan. (May 22-24, 2019)

Computing the Nucleolus of Matching Games in Polynomial Time. *International Symposium on Mathematical Programming*, University of Bordeaux. (July 1-6 2018)

An Elementary Integrality Proof of Rothblum's Stable Matching Formulation. 9^{th} *Ottawa Mathematics Conference*, University of Ottawa. (June 17-19 2016)

Other Presentations

Semesterly Presenter. *CombOpt Reading Group*, University of Waterloo. (Spring 2017 - Fall 2019)

Optimal Stable Matching. *3 Minute Thesis*, University of Waterloo. (Feb 14 2017)

A Short New Proof that the Stable Matching Polytope is Integral. *Optimization Seminar*, University of Waterloo. (Jan 25 2017)

Teaching Experience

University of Waterloo

Fall	2020	Teaching Assistant, CO 602 Fundamentals of Optimization
Fall	2020	Teaching Assistant, CO 351 Network Flow Theory
Spring	2020	Lecturer, CO 327 Deterministic OR Models
Winter	2020	Teaching Assistant, CO 353 Computational Discrete Optimization
Fall	2019	Teaching Assistant, CO 456 Introduction to Game Theory
Spring	2019	Lecturer, CO 327 Deterministic OR Models
Winter	2019	Teaching Assistant, CO 353 Computational Discrete Optimization
Fall	2018	Teaching Assistant, CO 456 Introduction to Game Theory
Spring	2018	Teaching Assistant, CO 351 Network Flow Theory
Winter	2018	Teaching Assistant, CO 353 Computational Discrete Optimization
Fall	2017	Teaching Assistant, CO 456 Introduction to Game Theory
Spring	2017	Teaching Assistant, Co 250 Introduction to Optimization
Winter	2017	Teaching Assistant, CO 353 Computational Discrete Optimization
Fall	2016	Teaching Assistant, CO 456 Introduction to Game Theory
Spring	2016	Teaching Assistant, MATH 128 Calculus for the Sciences
Winter	2016	Teaching Assistant, CO 353 Computational Discrete Optimization
Fall	2015	Teaching Assistant, MATH 136 Linear Algebra 1

University of Windsor

Winter	2015	Teaching Assistant, 62-190 Mathematical Foundations
Fall	2015	Teaching Assistant, 62-120 Linear Algebra 1

Service

Aug	2020	Reviewer, International Symposium on Algorithms and Computation
Jan	2020	Reviewer, Symposium on Computational Geometry
Dec	2019	Creative Lead, TORCH Operations Research Challenge
Oct	2019	Reviewer, Algorithmica
July	2019	Subreviewer, SODA 2019 on behalf of Laura Sanità
March	2019	Volunteer Organizer, TORCH Operations Research Challenge at University of Waterloo
Fall	2018	Co-Organizer, CombOpt Reading Group at University of Waterloo *(ongoing)*
Spring	2018	Subreviewer, EC 2018 on behalf of Jochen Köenmann
March	2018	Volunteer Organizer, TORCH Operations Research Challenge at University of Waterloo
2017	2018	Graduate Student Representative, C&O to Computing Facilities
Spring	2017	Volunteer, IPCO 2017 at University of Waterloo
Spring	2017	Subreviewer, ESA 2017 on behalf of Jochen Könemann
2014	2015	Undergraduate Student Representative, Mathematics Department Council at University of Windsor
2014	2015	Finance Minister, Computer Science Society at University of Windsor