

Hao Sun

Personal Data

Degrees

Ph.D. University of Waterloo, Ontario, Canada Thesis title: <i>Transversal Problems In Sparse Graphs</i> Thesis advisor: Prof. Jochen Koenemann	Sept 2016 - Sept 2022
Masters of Mathematics University of Waterloo, Ontario, Canada Thesis title: <i>ADMM for SDP Relaxation of GP</i> Thesis advisors: Prof. Henry Wolkowicz, Prof. William Cook	Sept 2014 - Aug 2016
Honours Bachelor of Math (double major in Combinatorics & Optimization and Pure Math) , with distinction –Dean’s Honours List. University of Waterloo	Sept 2010 - May 2014

Employment

University of Alberta, Edmonton, Alberta, Canada Postdoctoral scholar	Sept 2022 - present
University of Waterloo, Waterloo, Ontario, Canada C&O Undergraduate Summer Research Assistant	May-Aug, 2014
University of Waterloo, Waterloo, Ontario, Canada C&O Undergraduate Summer Research Assistant	May-Aug, 2013
University of Waterloo, Waterloo, Ontario, Canada C&O Undergraduate Summer Research Assistant	May-Aug, 2012

Research

Areas of Interest

Combinatorial Optimization, Approximation Algorithms, Feedback Vertex Set, Facility Location

Publications

1. Hao Sun A Constant Factor Approximation for Directed Feedback Vertex Set in Graphs of Bounded Genus <https://arxiv.org/submit/5211117> Submitted to IPCO 2024
2. Zachary Friggstad, Mohsen Rezapour, Mohammad Salavatipour and Hao Sun A QPTAS for Facility Location on Unit Disk graphs Submitted to STACS 2024

3. Alexander Göke, Jochen Koenemann, Matthias Mnich, Hao Sun Hitting Weighted Even Cycles in Planar Graphs APPROX 2021 <https://drops.dagstuhl.de/opus/volltexte/2021/14718/pdf/LIPIcs-APPROX25.pdf>. Also submitted to SIDMA.
4. Hao Sun An improved approximation bound for minimum weight dominating set on graphs of bounded arboricity In: Koenemann, J., Peis, B. (eds) Approximation and Online Algorithms. WAOA 2021. Lecture Notes in Computer Science(), vol 12982. Springer, Cham.
5. Li, X., Pong, T.K., Sun, H. Wolkowicz, H. A strictly contractive Peaceman-Rachford splitting method for the doubly nonnegative relaxation of the minimum cut problem. *Comput Optim Appl* 78, 853–891 (2021). <https://doi.org/10.1007/s10589-020-00261-4>
6. Jim Geelen, Hao Sun, A proof of Rado’s Theorem via principal extension, *Advances in Applied Mathematics*, 2020, 102013, ISSN 0196-8858, <https://doi.org/10.1016/j.aam.2020.102013>.
7. Hao Sun (2016). ADMM for SDP Relaxation of GP. UWSpace. <http://hdl.handle.net/10012/10727>
8. Ting Kei Pong, Hao Sun, Ningchuan Wang, Henry Wolkowicz Eigenvalue, quadratic programming, and semidefinite programming relaxations for a cut minimization problem. *Comput. Optim. Appl.* 63(2): 333-364 (2016)

Awards and Scholarships

- GRS 109324 Award, GRS 10001-10329 Award \$10,042** 2021-2022
- Math Faculty Award-C&O, Math Domestic Graduate Award, GRS 109324 Award (\$14,586)** 2019-2020
- Math Faculty Award-C&O, Math Domestic Graduate Award, GRS 109324 Award (\$14,181)** 2018-2019
- Math Faculty Award-C&O, Math Domestic Graduate Award, William Tutte Postgrad Scholarship, GRS 109324 Award (\$14,058)** 2017-2018
- Math Faculty Award-C&O, Math Domestic Graduate Award, GRS 109324 Award, GRS 113645 Award (\$14,232)** 2016-2017
- Dean of Math Graduate Scholarship, GRS 113645 Award, Math Domestic Graduate Award, MAT Grad Exp Award - CO (\$20,254.00)** 2015-2016
- Dean of Math Award (\$25 000/year)** Fall 2014- August 2016
- The Dr. Nathan Mendelsohn Prize, University of Manitoba,** June 2013.
- University of Waterloo President’s Research Award,** Winter 2013 & Fall 2013.
- The University of Waterloo National Scholarship (Kenneth D. Fryer Scholarship),** 2010-2014.

Conferences Attended

Approximation Algorithms and the Hardness of Approximation September 17-22, 2023, Banff International Research Station, Canada

Discrete Optimization Trimester Program at the Hausdorff Research Institute for Mathematics
September 6 - December 17, 2021

The 22nd Conference on Integer Programming and Combinatorial Optimization May 19–21, 2021, Atlanta, Georgia, USA

The 20th Conference on Integer Programming and Combinatorial Optimization, University of Michigan, Michigan. (May 22-24 2019)

Summer School on Combinatorial Optimization, Hausdorff Center for Mathematics, Bonn, Germany.
(August 20-24 2018)

The 19th Conference on Integer Programming and Combinatorial Optimization Waterloo, Canada
June 26 - 28, 2017,

22nd International Symposium on Mathematical Programming Pittsburgh (12-17 Jul 15)

The Summer School on Optimization. The Pacific Institute & University of Calgary July 2013

Canadian Undergraduate Math Conference / Optimization Training Workshop (UBCO) June 2012

Teaching Activities (at University of Waterloo)

Math 135 Instructor Sept-Dec 2020

Graduate T.A. Sept 2014 – Aug 2020, Jan 2021 - Present

CO 250 Fill in Lecturer (two 80 minute lectures) Fall 2018

Math 136 (Linear Algebra), Residence MKV Tutor Winter 2012

Math 147 (Calculus -Advanced), TA Fall 2011

Service

The PM/AM/C&O Club, VP

Fall 2013

University of Waterloo Go Club, President

Fall 2012- May 2014