

## Education

PhD, Computer Science	University of Waterloo	2017
MMath, Computational Mathematics	University of Waterloo	2009
BMath, Computational Mathematics	University of Waterloo	2008

## Appointments

Assistant Professor	University of Windsor	2021–
Postdoctoral Researcher	Carleton University	2020
Postdoctoral Researcher	University of Waterloo	2017–2019
Research Intern	Maplesoft	2017–2018

## Adjunct Appointments

Adjunct Assistant Professor	University of Waterloo	2024–
Adjunct Research Professor	Carleton University	2021–
Adjunct Assistant Professor	University of Windsor	2020
Visiting Postdoctoral Researcher	Wilfrid Laurier University	2019

## Research Interests

Computer-assisted proofs, satisfiability solving, symbolic computation, discrete mathematics, experimental mathematics, number theory.

## Journal Publications

- C. Bright*. A New Lower Bound in the *abc* Conjecture. *Canadian Mathematical Bulletin*, 2024.
- C. Bright*, I. Kotsireas, V. Ganesh. When Satisfiability Solving Meets Symbolic Computation. *Communications of the ACM*, 2022.
- C. Bright*, I. Kotsireas, A. Heinle, V. Ganesh. Complex Golay Pairs up to Length 28: A Search via Computer Algebra and Programmatic SAT. *Journal of Symbolic Computation*, 2021.
- C. Bright*, I. Kotsireas, V. Ganesh. New Infinite Families of Perfect Quaternion Sequences and Williamson Sequences. *IEEE Transactions on Information Theory*, 2020.
- C. Bright*, K. Cheung, B. Stevens, D. Roy, I. Kotsireas, V. Ganesh. A Nonexistence Certificate for Projective Planes of Order Ten with Weight 15 Codewords. *Applicable Algebra in Engineering, Communication and Computing*, 2020. **AAECC 2020 best paper award**.
- C. Bright*, I. Kotsireas, V. Ganesh. Applying Computer Algebra Systems with SAT Solvers to the Williamson Conjecture. *Journal of Symbolic Computation*, 2020.
- C. Bright*, D. Đoković, I. Kotsireas, V. Ganesh. The SAT+CAS Method for Combinatorial Search with Applications to Best Matrices. *Annals of Mathematics and Artificial Intelligence*, 2019.
- E. Zulkoski, *C. Bright*, A. Heinle, I. Kotsireas, K. Czarnecki, V. Ganesh. Combining SAT

Solvers with Computer Algebra Systems to Verify Combinatorial Conjectures. *Journal of Automated Reasoning*, 2017.

*C. Bright*, R. Devillers, J. Shallit. Minimal Elements for the Prime Numbers. *Journal of Experimental Mathematics*, 2016.

### Conference Publications

S. Sakib, M. Asaduzzaman, *C. Bright*, C. Morgan. Understanding the Popularity of Packages in Maven Ecosystem. *Proceedings of the 22nd International Conference on Mining Software Repositories*, 2025, to appear.

Z. Li, *C. Bright*, V. Ganesh. A SAT Solver + Computer Algebra Attack on the Minimum Kochen–Specker Problem. *Proceedings of the 33rd International Joint Conference on Artificial Intelligence*, 2024.

A. Barnoff, *C. Bright*, J. Shallit. Using Finite Automata to Compute the Base- $b$  Representation of the Golden Ratio and Other Quadratic Irrationals. *Proceedings of the 28th International Conference on Implementation and Application of Automata*, 2024.

Y. Ajani, *C. Bright*. SAT and Lattice Reduction for Integer Factorization. *Proceedings of the 49th International Symposium on Symbolic and Algebraic Computation*, 2024.

N. Rubin, *C. Bright*, K. Cheung, B. Stevens. Improving Integer and Constraint Programming for Graeco-Latin Squares. *Proceedings of the 32nd IEEE International Conference on Tools with Artificial Intelligence*, 2021.

*C. Bright*, K. Cheung, B. Stevens, I. Kotsireas, V. Ganesh. A SAT-based Resolution of Lam’s Problem. *Proceedings of the 35th AAI Conference on Artificial Intelligence*, 2021.

*C. Bright*, K. Cheung, B. Stevens, I. Kotsireas, V. Ganesh. Unsatisfiability Proofs for Weight 16 Codewords in Lam’s Problem. *Proceedings of the 29th International Joint Conference on Artificial Intelligence*, 2020.

*C. Bright*, K. Cheung, B. Stevens, I. Kotsireas, V. Ganesh. Nonexistence Certificates for Ovals in a Projective Plane of Order Ten. *Proceedings of the 31st International Workshop on Combinatorial Algorithms*, 2020.

*C. Bright*, I. Kotsireas, V. Ganesh. SAT Solvers and Computer Algebra Systems: A Powerful Combination for Mathematics. *Proceedings of the 29th International Conference on Computer Science and Software Engineering*, 2019.

*C. Bright*, J. Gerhard, I. Kotsireas, V. Ganesh. Effective Problem Solving Using SAT Solvers. *Maple in Mathematics Education and Research, Third Maple Conference Proceedings*, 2019.

*C. Bright*, D. Đoković, I. Kotsireas, V. Ganesh. A SAT+CAS Approach to Finding Good Matrices: New Examples and Counterexamples. *Proceedings of the 33rd AAI Conference on Artificial Intelligence*, 2019.

*C. Bright*, I. Kotsireas, V. Ganesh. A SAT+CAS Method for Enumerating Williamson Matrices of Even Order. *Proceedings of the 32nd AAI Conference on Artificial Intelligence*, 2018.

*C. Bright*, I. Kotsireas, A. Heinle, V. Ganesh. Enumeration of Complex Golay Pairs via Programmatic SAT. *Proceedings of the 43rd International Symposium on Symbolic and Algebraic Computation*, 2018.

*C. Bright*, V. Ganesh, A. Heinle, I. Kotsireas, S. Nejati, K. Czarnecki. MathCheck2: A SAT + CAS Verifier for Combinatorial Conjectures. Proceedings of the 18th International Workshop on Computer Algebra in Scientific Computing (invited to the SC<sup>2</sup> track) and the 1st SC<sup>2</sup> Workshop, 2016.

*C. Bright*, A. Storjohann. Vector Rational Number Reconstruction. Proceedings of the 36th International Symposium on Symbolic and Algebraic Computation, 2011.

### Workshop Publications

N. Alamgir, S. Nejati, *C. Bright*. SHA-256 Collision Attack with Programmatic SAT. Joint Proceedings of the 9th Workshop on Practical Aspects of Automated Reasoning and the 9th Satisfiability Checking and Symbolic Computation Workshop, 2024.

D. Dallaire, *C. Bright*. Enumerating Projective Planes of Order Nine with Proof Verification. Proceedings of the 7th International Workshop on Satisfiability Checking and Symbolic Computation, 2022.

Z. Li, *C. Bright*, V. Ganesh. An SC-Square Approach to the Minimum Kochen–Specker Problem. Proceedings of the 7th International Workshop on Satisfiability Checking and Symbolic Computation, 2022.

### Artistic Publications

B. Lee, *C. Bright*. Hadamard 160 in Cool Tones. Maple Conference Mathematical Art Gallery, 2021. **Judges’ choice award.**

### Edited Proceedings

*C. Bright*, J. Davenport. Proceedings of SC-Square 2021: The 6th International Workshop on Satisfiability Checking and Symbolic Computation, 2022.

### Extended Abstracts

C. Duggan, Z. Li, *C. Bright*, V. Ganesh. A SAT + Computer Algebra System Verification of the Ramsey Problem  $R(3, 8)$ . Student abstract proceedings of the 38th AAAI Conference on Artificial Intelligence, 2024.

Z. Li, *C. Bright*, V. Ganesh. A SAT Solver and Computer Algebra Attack on the Minimum Kochen–Specker Problem. Student abstract proceedings of the 38th AAAI Conference on Artificial Intelligence, 2024.

Y. Ajani, *C. Bright*. A Hybrid SAT and Lattice Reduction Approach for Integer Factorization [extended abstract]. Proceedings of the 8th International Workshop on Satisfiability Checking and Symbolic Computation, 2023.

N. Rubin, *C. Bright*, B. Stevens, K. Cheung. Integer and Constraint Programming Revisited for Mutually Orthogonal Latin Squares. Student abstract proceedings of the 36th AAAI Conference on Artificial Intelligence, 2022.

*C. Bright*, K. Cheung, B. Stevens, I. Kotsireas, V. Ganesh. Solving Lam’s Problem via SAT and Isomorph-Free Exhaustive Generation [extended abstract]. Recently Published Research Track of the 19th International Conference on Principles of Knowledge Representation and Reasoning, 2022.

*C. Bright*, I. Kotsireas, V. Ganesh. The SAT+CAS Paradigm and the Williamson Conjecture [extended abstract]. ACM Communications in Computer Algebra, 2018.

### Submitted Publications

Z. Li, C. Duggan, *C. Bright*, V. Ganesh. Verified Certificates via SAT and Computer Algebra Systems for the Ramsey  $R(3, 8)$  and  $R(3, 9)$  Problems.

S. Sakib, M. Asaduzzaman, *C. Bright*. SMTpip: A Novel SMT Solver-based Dependency Conflict Resolution Technique.

T. Lumsden, I. Kotsireas, *C. Bright*. New Results on Periodic Golay Pairs.

Z. Li, *C. Bright*, V. Ganesh. Symmetry Breaking via Isomorph-free Generation in SAT+CAS Systems.

P. Jha, Z. Li, Z. Lu, *C. Bright*, V. Ganesh. AlphaMapleSAT: An MCTS-based Cube-and-Conquer SAT Solver for Hard Combinatorial Problems.

### Teaching

#### *University of Windsor*

Key Concepts in Computer Science	52 students	Winter 2025
Selected Topics: Cryptography	4 students	Winter 2025
Introduction to Algorithms and Programming I	4 students	Fall 2024
Introduction to Algorithms and Programming II	7 students	Fall 2024
Computational Mathematics	3 students	Winter 2024
Introduction to Algorithms and Programming II (2 sections)	304 students	Winter 2024
Introduction to Algorithms and Programming II	72 students	Fall 2023
Directed Special Studies	1 student	Summer 2023
Introduction to Algorithms and Programming II	71 students	Fall 2022
Computational Mathematics	5 students	Fall 2022
Introduction to Algorithms and Programming II	80 students	Summer 2022
Key Concepts in Computer Science	48 students	Summer 2022
Introduction to Algorithms and Programming II	167 students	Winter 2022
Key Concepts in Computer Science	93 students	Winter 2022
Computational Discrete Mathematics	2 students	Fall 2021
Introduction to Algorithms and Programming II	111 students	Winter 2021

#### *University of Waterloo*

Elementary Algorithm Design and Data Abstraction	88 students	Fall 2015
Introduction to Computer Science 1 (2 sections)	145 students	Spring 2015
Designing Functional Programs	103 students	Fall 2014

**Teaching Development**

Completed six workshops in the University of Waterloo's Center for Teaching Excellence "Fundamentals of University Teaching" program while a PhD student and Postdoctoral Researcher.

**Invited Tutorials**

Isomorph-Free Exhaustive Generation in SAT Solving. New Perspectives in Symbolic Computation and Satisfiability Checking, Dagstuhl Seminar, Wadern, Germany, February 17, 2022.

**Invited Talks**

SAT Solving with Lattice Reduction for Integer Factorization. University of Waterloo Computational Mathematics Colloquium, Waterloo, Canada, October 4, 2024.

SAT and Lattice Reduction for Integer Factorization. PIMS-CORDS SFU Operations Research Seminar, Vancouver, Canada, August 22, 2024.

SAT and Computer Algebra. SAT Encodings and Beyond, Dagstuhl Seminar, Wadern, Germany, June 27, 2023.

A SAT and Orderly Generation Approach in the Quest for the Minimum Kochen–Specker System. Canadian Discrete and Algorithmic Mathematics Conference, Winnipeg, Canada, June 6, 2023.

SAT + Isomorph-free Generation ... and the Quest for the Minimum Kochen–Specker System. Pushing the Limits of Computational Combinatorial Constructions, Dagstuhl Seminar, Wadern, Germany, April 20, 2023.

SAT Solvers, Isomorph-free Generation, and the Quest for the Minimum Kochen–Specker System. SFU Discrete Mathematics Seminar, Vancouver, Canada, February 8, 2023.

SAT Solvers, Isomorph-free Generation, and the Quest for the Minimum Kochen–Specker System. UBC Discrete Mathematics Seminar, Vancouver, Canada, February 7, 2023.

Searching for Kochen–Specker Systems With Orderly Generation and Satisfiability Solving. Applications of Computer Algebra, Gebze Technical University, Istanbul, Turkey, August 15, 2022.

Searching for Kochen–Specker Systems With Orderly Generation and Satisfiability Solving. Satisfiability: Theory, Practice, and Beyond Reunion, Simons Institute, Berkeley, USA, June 16, 2022.

SAT Solving with Computer Algebra for Combinatorics. Tutte Colloquium, University of Waterloo, Waterloo, Canada, April 1, 2022.

When Computer Algebra Meets Satisfiability: A New Approach to Combinatorial Mathematics. New Technologies in Mathematics Seminar Series, Harvard University, Cambridge, USA (with Vijay Ganesh), November 3, 2021.

Satisfiability Checking + Symbolic Computation: A New Approach to Combinatorial Mathematics. LAPIS Meeting, Rice University, Houston, USA (with Vijay Ganesh), July 12, 2021.

SAT Solvers for Combinatorics Problems. CanaDAM 2021 (Held Online), May 25, 2021.

Computational Algebra and Logic for Mathematical Search. University of Windsor Department of Mathematics and Statistics Colloquium, Windsor, Canada (Held Online), May 6, 2021.

Computer Algebra and SAT for Mathematical Search. Theoretical Foundations of SAT/SMT Solving, Simons Institute, Berkeley, USA (Held Online), April 21, 2021.

A Resolution of Lam's Problem via Satisfiability Solvers. Canadian Mathematical Society Winter Meeting, Montréal, Canada (Held Online), December 4, 2020.

SAT Solving with Computer Algebra for Fast, Verified Mathematical Search. University of Windsor School of Computer Science Seminar, Windsor, Canada, March 12, 2020.

SAT Solving with Computer Algebra and its Application to Graph Theory and Geometry. Computational Geometry Lab Seminar, Ottawa, Canada, February 28, 2020.

SAT Solving with Computer Algebra: A Powerful Combinatorial Search Method. UBC Discrete Mathematics Seminar, Vancouver, Canada, September 10, 2019.

SAT Solving with Computer Algebra: A Powerful Combinatorial Search Method. University of Victoria Discrete Mathematics Seminar, Victoria, Canada, September 6, 2019.

SAT Solving with Computer Algebra: A Powerful Combinatorial Search Method. SFU Discrete Mathematics Seminar, Vancouver, Canada, September 3, 2019.

SAT+CAS: A Powerful New Combinatorial Search Method. Ottawa–Carleton Combinatorics & Optimization Seminar Series, Ottawa, Canada, October 5, 2018.

Faster SAT Solving with Applications to Sudoku. Maplesoft, Waterloo, Canada, August 31, 2018.

Improvements to Satisfy and ChromaticNumber. Maplesoft, Waterloo, Canada, March 23, 2018.

### **Organized Minisymposiums**

Computer-Assisted Mathematics. Accepted to the Ninth Canadian Discrete and Algorithmic Mathematics Conference, Winnipeg, Canada, June 5, 2023. Speakers: Taylor Brysiewicz, Cayden Codel, Craig S. Kaplan, Narad Rampersad, Brett Stevens.

### **Conference and Workshop Talks**

SAT and Lattice Reduction for Integer Factorization. International Symposium on Symbolic and Algebraic Computation, Raleigh, USA, July 18, 2024.

Effective Problem Solving using SAT Solvers. Canadian Discrete and Algorithmic Mathematics Conference, Winnipeg, Canada, June 5, 2023. (*Impromptu talk given to replace a speaker whose flight was cancelled.*)

A New Lower Bound in the *abc* Conjecture. Canadian Discrete and Algorithmic Mathematics Conference, Winnipeg, Canada, June 5, 2023.

Solving Lam's Problem via SAT and Isomorph-Free Exhaustive Generation. Principles of Knowledge Representation and Reasoning, Haifa, Israel, August 3, 2022.

A SAT-Based Resolution of Lam's Problem. AAAI Conference on Artificial Intelligence, Vancouver, Canada (Held Online), February 3, 2021.

Unsatisfiability Proofs for Weight 16 Codewords in Lam's Problem. International Joint Conference on Artificial Intelligence, Yokohama, Japan (Held Online), January 14, 2021.

Nonexistence Certificates for Ovals in a Projective Plane of Order Ten. International Workshop

on Combinatorial Algorithms, Bordeaux, France (Held Online), June 8, 2020.

SAT Solvers and Computer Algebra Systems: A Powerful Combination for Mathematics. International Conference on Computer Science and Software Engineering, Markham, Canada, November 4, 2019.

Effective Problem Solving using SAT Solvers. Maple Conference 2019, Waterloo, Canada, October 17, 2019.

Searching for Projective Planes with Computer Algebra and SAT Solvers. Applications of Computer Algebra, Montréal, Canada, July 19, 2019.

A SAT+CAS Approach to Finding Good Matrices: New Examples and Counterexamples. AAI Conference on Artificial Intelligence, Honolulu, USA, January 30, 2019.

MathCheck: A SAT+CAS Mathematical Conjecture Verifier. International Congress on Mathematical Software, Notre Dame, USA, July 26, 2018.

Enumeration of Complex Golay Pairs via Programmatic SAT. International Symposium on Symbolic and Algebraic Computation, New York, USA, July 17, 2018.

A SAT+CAS Method for Enumerating Williamson Matrices of Even Order. AAI Conference on Artificial Intelligence, New Orleans, USA, February 4, 2018.

A SAT+CAS Method for Enumerating Williamson Matrices of Even Order. International Workshop on Satisfiability Checking and Symbolic Computation, Kaiserslautern, Germany, July 29, 2017.

MathCheck2: Combining Learning-based Search (SAT) with Symbolic Computation (CAS). International Workshop on Satisfiability Checking and Symbolic Computation, Timișoara, Romania, September 24, 2016.

MathCheck2: A SAT+CAS Verifier for Combinatorial Conjectures. Computer Algebra in Scientific Computing, Bucharest, Romania, September 20, 2016.

MathCheck: A Math Assistant Combining SAT with Computer Algebra Systems. International Joint Conference on Artificial Intelligence, New York, USA, July 12, 2016.

MathCheck2: A SAT+CAS Verifier for Combinatorial Conjectures. International Workshop on Satisfiability Modulo Theories, Coimbra, Portugal, July 2, 2016.

MathCheck2: A SAT+CAS Verifier for Combinatorial Conjectures. Computationally Assisted Mathematical Discovery and Experimental Mathematics, London, Canada, May 13, 2016.

Vector Rational Number Reconstruction. International Symposium on Symbolic and Algebraic Computation, San Jose, USA, June 9, 2011.

### **Poster Presentations**

A SAT-Based Resolution of Lam's Problem. AAI Conference on Artificial Intelligence, Vancouver, Canada (Held Online), February 3, 2021.

Unsatisfiability Proofs for Weight 16 Codewords in Lam's Problem. International Joint Conference on Artificial Intelligence, Yokohama, Japan (Held Online), January 14, 2021.

A SAT+CAS Approach to Finding Good Matrices. AAI Conference on Artificial Intelligence, Honolulu, USA, January 30, 2019.

The SAT+CAS Paradigm and the Williamson Conjecture. International Symposium on Symbolic and Algebraic Computation, New York, USA, July 17, 2018.

A SAT+CAS Method for Enumerating Williamson Matrices of Even Order. AAAI Conference on Artificial Intelligence, New Orleans, USA, February 4, 2018.

Vector Rational Number Reconstruction. East Coast Computer Algebra Day, Waterloo, Canada, April 9, 2011.

### Awards

*Machine Assisted Proofs 2023* Attendee Award (accommodation up to \$1235 USD covered for selected attendees of workshop) 2023

*Applications of Computer Algebra* Early Researcher Award (with prize of about \$850) 2022

Judges' Choice Award at the *Maple Conference 2021* Mathematical Art Gallery. 2021

Recipient of the €4,000 Jacques Calmet award for the best paper appearing in the journal *Applicable Algebra in Engineering, Communication and Computing* in the year of 2020. 2021

Recipient of a Maple Application Center Editor's Choice award for developing an interactive Maple worksheet demonstrating how to solve Sudoku using a SAT solver. 2018

Invited paper in the *Journal of Automated Reasoning*. 2017

Received a 0x\$1.20 reward check from Donald Knuth for pointing out an error in *The Art of Computer Programming* present since the first edition in 1969. 2017

Invited paper in the SC<sup>2</sup> track at *Computer Algebra in Scientific Computing*. 2016

Recipient of the Morgan Deters award, a \$1200 USD travel grant awarded to select graduate students in the field of Satisfiability Modulo Theories. 2016

Recipient of a TA performance award, receiving \$500 for outstanding performance as a teaching assistant. 2013

Recipient of a University of Waterloo Computer Science special graduate scholarship, receiving \$1000 for my academic standing. 2011

### Grants

Digital Research Alliance of Canada Resource Allocation (awarded 218 years of processing time; worth around \$23K) 2024

Mitacs Globalink Grant (total funding of about \$9K for one summer intern) 2024

Mitacs Globalink Grant (total funding of about \$9K for one summer intern) 2023

Digital Research Alliance of Canada Resource Allocation (awarded 170 years of processing time and 20 terabytes of storage; worth around \$20K) 2023

Mitacs Globalink Grant (total funding of about \$18K for two summer interns) 2022

NSERC Discovery Grant (\$145K with a \$12.5K Discovery Launch Supplement) 2021

Startup Grant, University of Windsor (\$70K) 2021

NSERC Postdoctoral Fellowship (\$90K) 2020

Co-authored the research proposal "Amazon AWS for Automated Reasoning" that was awarded \$145K USD in Amazon AWS Credits. (PI: Vijay Ganesh) 2019

### Peer Reviewed and Deployed Programming

- Contributor to the computer algebra system Maple 2018 and 2019. My research led to a dramatic improvement in the performance of graph theory and logic commands. 2018
- Lead developer of the SAT+CAS system MathCheck for verifying or finding counterexamples to combinatorial conjectures. 2016
- Contributor to the open source number theory library FLINT. Oversaw the implementation of a fast lattice basis reduction algorithm. 2014

### Supervision and Mentoring

- Dr. Tanbir Ahmed (Research Associate, University of Windsor). Supervising projects in extremal combinatorics, SAT solving, and design theory. 2024–
- Aaron Barnoff (MSc Computer Science, University of Windsor). Supervising a project to apply SAT solving to problems in combinatorics on words. 2024–
- Lamina Zaman (BSc Computer Science, University of Windsor). Supervising a project to apply SAT solving to problems in extremal combinatorics. 2024–
- Aidan Bennett (BSc Mathematics and Computer Science, University of Windsor). Supervising a project to search for perfect quaternion sequences. 2024–
- Zhengyu Li (PhD Computer Science, Georgia Tech). Mentoring a project to apply SAT solvers and computer algebra to problems in physics (with Vijay Ganesh). Paper accepted to IJCAI 2024. 2023–
- Piyush Jha (PhD Computer Science, Georgia Tech). Mentoring a project to combine Monte Carlo tree search and SAT solving (with Vijay Ganesh). 2023–
- Sadman Sakib (Msc Computer Science, University of Windsor). Supervising a project to apply SAT/SMT solvers to dependency resolution (with Muhammad Asaduzzaman). 2023–
- Aaron Barnoff (BSc Computer Science, University of Windsor). Supervised an honours project to minimize discrete finite automata using SAT solvers. Paper accepted to CIAA 2024 (with Jeff Shallit). *Aaron graduated in 2024 and is now an MSc student at the University of Windsor.* 2023–2024
- Tyler Lumsden (BSc Computer Science, University of Windsor). Supervised an honours project to search for periodic Golay pairs; found the first examples of periodic Golay pairs of length 90. Paper under submission at a top journal (with Ilias Kotsireas). **Winner of an NSERC undergraduate student research assistantship award.** 2023–
- Ben Chittle (BSc Computer Science, University of Windsor). Supervised an honours project to certify the classification of the projective planes of order nine. 2023–2024
- Ambrose Colinot (Summer Intern, University of Windsor). Supervised a project to search for perfect quaternion sequences as a part of the 2022 Mitacs Globalink Research Internship program (with Ashwin Nayak). *Now a PhD student at Grenoble INP, France.* 2023
- Anikait Lakhota and Aayush Kapoor (BMath Computer Science, University of Waterloo). Mentored a project to combine SAT and more expressive solvers to search for circuits computing mathematical operations (with Vijay Ganesh and Supratik Chakraborty). 2023
- Amadou Keita (PhD Mathematics, University of Windsor). Supervising a project to develop

- constructions for orthogonal Latin squares (with Ilya Shapiro and Brett Stevens). 2022–  
 Nahiyah Alamgir (MSc Computer Science, University of Windsor). Supervising a project to  
 perform cryptanalysis of hash functions using SAT solvers. Paper accepted to the 2024 SC<sup>2</sup>  
 workshop. *Nahiyah graduated in 2024 and is seeking a position in industry.* 2022–2024
- Yameen Ajani (MSc Computer Science, University of Windsor). Supervised a project to factor  
 integers with known bits using SAT solvers. Paper accepted to ISSAC 2024 and the 2023 SC<sup>2</sup>  
 workshop. *Yameen graduated in 2024 and is now a developer at Agriculture and Agri-Food  
 Canada.* 2022–2024
- Zhengyu Li (MMath Computational Mathematics, University of Waterloo). Supervised a project  
 to apply SAT solvers and computer algebra to problems in physics (with Vijay Ganesh). Pub-  
 lished a student abstract at AAAI 2024. *Zhengyu graduated in 2023 and is now a PhD student  
 at Georgia Tech. Winner of the CM best presentation award.* 2022–2023
- Conor Duggan (MMath Computational Mathematics, University of Waterloo). Supervised a  
 project to apply SAT solvers and computer algebra to problems in Ramsey theory (with Vijay  
 Ganesh). Published a student abstract at AAAI 2024. *Conor graduated in 2024 and is now a  
 data analyst at AON Insurance.* 2022–2024
- Shreyash Mutyalwar (Summer Intern, University of Windsor). Supervised a project to test  
 Schnorr’s algorithm for factoring integers using Diophantine approximation as a part of the  
 2022 Mitacs Globalink Research Internship program. *Shreyash graduated from COEP Techno-  
 logical University in 2023 and is now a software engineer at Arista Networks.* 2022
- Vidyanshu Mishra (Summer Intern, University of Windsor). Supervised a project to experi-  
 mentally test an algorithm for factoring integers with known bits using SAT solvers as a part  
 of the 2022 Mitacs Globalink Research Internship program. *Vidyanshu graduated from Delhi  
 Technological University in 2023 and is now a product analyst at Sprinklr.* 2022
- Daniel Dallaire (BSc Mathematics and Computer Science, University of Windsor). Supervised  
 an honours project to certify the classification of the projective planes of order nine. Paper  
 accepted to the 2022 SC<sup>2</sup> workshop. *Daniel graduated in 2022 and started as a Master’s student  
 at the University of Ottawa.* 2021–2022
- Zhengyu Li (BSc Computer Science, University of Toronto). Mentored a project to apply SAT  
 solvers and computer algebra to problems in physics (with Vijay Ganesh). Paper accepted to  
 the 2022 SC<sup>2</sup> workshop. *Zhengyu graduated in 2022 and started as a Master’s student at the  
 University of Waterloo.* 2021–2022
- Noah Rubin (BMath Mathematics, Carleton University). Supervisor of a Bachelor thesis project  
 for combining integer and constraint programming to search for combinatorial designs (with  
 Kevin Cheung and Brett Stevens). Paper accepted to ICTAI 2021 and a student abstract at AAAI  
 2022. *Noah graduated in 2022 and is currently a software developer at Canada’s national  
 cryptologic agency.* 2020–2022
- Abinaya Venkatesan (MEng Electrical and Computer Engineering, University of Waterloo).  
 Mentored a project to apply SAT solvers to problems in circuit complexity (with Vijay Ganesh  
 and Supratik Chakraborty). *Abinaya graduated in 2022 and is now a software engineer at the  
 Royal Bank of Canada.* 2020–2022
- Abhinav Baid (BEng Computer Science, Birla Institute of Technology and Science). Supervised

during Google’s Summer of Code program (with William Hart). The project resulted in a high performance implementation of a lattice basis reduction algorithm in the number theory library FLINT. *Abhinav graduated in 2017 and became a software engineer for Bloomberg LP.* 2014

### Committee Service (as Chair)

Co-chair and organizer of the School of Computer Science Colloquium at the University of Windsor for three years (with Ahmad Biniiaz for two years and Muhammad Asaduzzaman for one year). 2022–2025

Co-chair (with Erik Postma) of the “Algorithms and Software” track of the *Maple Conference 2024*. 2024

Chair of the MSc thesis defence of Ibraheem Aloran. 2024

Chair of the Computer Science Awards committee at the University of Windsor. 2023–2024

Chair of the MSc thesis defence of Vlad Tusinean. 2023

Co-chair (with Jürgen Gerhard) of the “Algorithms and Software” track of the *Maple Conference 2023*. 2023

Chair of the MSc thesis defence of Vishakha Gautam. 2023

Co-chair (with James Davenport) of the *2021 International Workshop on Satisfiability Checking and Symbolic Computation*. 2021

### Other Service

Member of the Computer Science Graduate Executive committee at the University of Windsor for three years. 2022–2025

Member of the Computer Science Appointments committee at the University of Windsor for two years. 2022–2024

Volunteer for CS open houses for the University of Windsor for two years. 2023–2024

Member of the Computer Science PhD Admissions and Progress committee at the University of Windsor. 2023–2024

Member of the PhD student Abdulrauf Gidado’s thesis committee. 2020–2024

Member of the MSc student Jilsa Chandrana’s thesis committee. 2024

On the program committee for the *2024 International Workshop on Satisfiability Checking and Symbolic Computation*. 2024

Member of the PhD student Chris Khalil’s thesis committee. 2023–

On the program committee for the *2024 AAAI Conference on Artificial Intelligence*. 2023

On the program committee for the *2023 International Workshop on Satisfiability Checking and Symbolic Computation*. 2023

On the program committee for the *2022 International Workshop on Satisfiability Checking and Symbolic Computation*. 2022

Associate editor of the journal *Maple Transactions*. 2021–

On the program committee for the *2021 AAAI Conference on Artificial Intelligence*. 2020

On the program committee for the *2020 Maple Conference*. 2020

On the program committee for the *2020 International Workshop on Satisfiability Checking and Symbolic Computation*. 2020

Administered the webpage of the Computer Science Graduate Student Association at the University of Waterloo for several years. 2014–2017

Have been an executive member and volunteer instructor of three university clubs: Mambo Club at the University of Waterloo, KW Salseros at Wilfrid Laurier University, and UOSalsa at the University of Ottawa.

### Grant Reviewing

NSERC Discovery Grant Reviewer 2024

NSERC Discovery Grant Reviewer 2023

### Paper Reviewing

Journal of Computational Algebra 2024

IEEE Transactions on Aerospace and Electronic Systems 2024

Journal of Artificial Intelligence Research 2024

International Workshop on Satisfiability Checking and Symbolic Computation 2024

IEEE Transactions on Information Theory 2024

Open Physics 2024

AAAI Conference on Artificial Intelligence (6) 2023

Journal of Symbolic Computation 2023

Cryptography and Communications 2023

Maple Transactions 2023

International Workshop on Satisfiability Checking and Symbolic Computation (2) 2023

IEEE Transactions on Information Theory 2023

Journal of Automated Reasoning 2022

Graphs and Combinatorics 2022

International Workshop on Satisfiability Checking and Symbolic Computation 2022

International Conference on Tools and Algorithms for the Construction and Analysis of Systems  
2021

IEEE Access 2021

IEEE Transactions on Information Theory 2021

Cryptography and Communications 2021

Maple Conference (3) 2021

International Workshop on Satisfiability Checking and Symbolic Computation (3) 2021

AAAI Conference on Artificial Intelligence 2020

Computer Algebra in Scientific Computing 2020

International Workshop on Satisfiability Checking and Symbolic Computation 2020

International Conference on Tools with Artificial Intelligence (2)	2019
IEEE Access	2019
International Symposium on Symbolic and Algebraic Computation	2019
Notes on Number Theory and Discrete Mathematics	2018
International Conference on Formal Structures for Computation and Deduction (2)	2018
International Workshop on Satisfiability Checking and Symbolic Computation	2017
International Symposium on Symbolic and Numeric Algorithms for Scientific Computing	2017
International Conference on Principles and Practice of Constraint Programming	2017
International Workshop on Satisfiability Checking and Symbolic Computation	2016
International Symposium on Formal Methods	2016
Computer Algebra in Scientific Computing	2016
International Symposium on Artificial Intelligence and Mathematics	2015
Journal of Integer Sequences	2014