

ANDRE AUGUSTO CIRE

April 2026

Department of Management, University of Toronto Scarborough
Rotman School of Management, University of Toronto (cross-appoint.)
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RESEARCH

My research investigates how to make complex, high-dimensional decision problems computationally tractable while uncovering structural insights that guide effective decision-making. I develop optimization and approximation methodologies that bridge mathematical programming, stochastic control, and artificial intelligence. A central theme of my work is exploiting problem structure, such as weak coupling and network interactions, to design scalable algorithms with provable guarantees and strong numerical performance. These methods enable rigorous and practical decision support in scheduling, transportation, and healthcare systems characterized by uncertainty and combinatorial complexity.

ACADEMIC APPOINTMENTS

<i>July 2021 - Present</i>	Associate Professor, Operations Management Associate Chair, Research and Strategy (July 1 st , 2024 - present) Associate Chair, Strategic Initiatives (July 1 st , 2023 – June 30 th , 2024) Department of Management, University of Toronto Scarborough Rotman School of Management (Cross-Appointed) University of Toronto
<i>July 2014 – July 2021</i>	Assistant Professor, Operations Management Department of Management, University of Toronto Scarborough Rotman School of Management (Cross-Appointed) University of Toronto

EDUCATION

<i>August 2014</i>	Ph.D., Operations Research Tepper School of Business, Carnegie Mellon University Dissertation Title: Decision Diagrams for Optimization Advisors: <i>Dr. Willem-Jan van Hoes</i> and <i>Dr. John Hooker</i>
<i>August 2011</i>	M.Sc., Operations Research Tepper School of Business, Carnegie Mellon University
<i>June 2009</i>	M.Sc., Computer Science Institute of Computing, State University of Campinas Advisors: <i>Dr. Arnaldo Moura</i> and <i>Dr. Cid C. de Souza</i>
<i>December 2006</i>	B.Sc., Computer Science Institute of Computing, State University of Campinas

PUBLICATIONS

Author's Order and Publication Notes

- In operations management, authors are listed in either alphabetical or reverse alphabetical order. All collaborators must have contributed significantly to the paper to be listed.
- Students and trainees (i.e., MSc, Ph.D., and post-doctoral fellows) at the time of publication are listed first on the author list. They are marked with * in the publications below.
- Publications are listed in reverse chronological order of appearance/acceptance.
- A DOI or an official link is also added to the reference whenever possible.

Working Papers

1. S. Nadarajah, A. A. Cire. Delayed Allocation in Marginalized Flow Models for Weakly Coupled Markov Decision Processes. [\[Link\]](#)
2. L. Lozano, D. Bergman, A. A. Cire. Network Relaxations for Combinatorial Bilevel Optimization under Linear Interactions. [\[Link\]](#)
3. N. Chen, A. A. Cire, P. Gao, S. Wang*. Assortment Optimization without Prediction: An End-to-end Framework with Transaction Data. [\[Link\]](#)
4. V. Slaugh, A. A. Cire. Dialysis Clinic Patient Flow and Work Design. [\[Link\]](#)
5. Z. Xu*, A. Diamant, A. A. Cire, E. Furman, O. Baron. Managing Scarce MRI Capacity in Overloaded Queueing Systems. [\[Link\]](#)
6. L. Lozano, D. Bergman, A. A. Cire. Constrained Shortest-Path Reformulations via Decision Diagrams for Structured Two-stage Optimization Problems. [\[Link\]](#)
7. O. Baron, O. Berman, A. A. Cire, V. Roshanaei. Loss Ratio as a Risk Constraint: Analysis and Optimization. [\[Link\]](#)

Journal Papers

1. C. Cardonha, D. Bergman, A. A. Cire, L. Lozano, and T. Yunes. The Sensitivity of the US Presidential Election to Coordinated Voter Relocation. *INFORMS Journal on Computing*, forthcoming 2026. [\[Link\]](#)
2. C. Cardonha, A. A. Cire, L.C. Villa Real. Design and Analysis of Efficient Sequencing Policies for Linear Cold Storage Devices. *Production and Operations Management*, 34(8):2232-2251, 2025 [\[Link\]](#)
3. A. Hosseiniinasab*, W.-J. van Hoeve, A.A. Cire. Memory-efficient Sequential Pattern Mining with Hybrid Tries. *Journal of Machine Learning Research*, 5(227):1-29, 2025 [\[Link\]](#)
4. S. Nadarajah, A. A. Cire. Self-Adapting Network Relaxations for Weakly Coupled Markov Decision Processes. *Management Science*, 71(2):1779-1802, 2024. [\[Link\]](#)
5. O. Baron, A. A. Cire, S. Savaser*. Decentralized Online Order Fulfillment in Omni-Channel Retailers. *Production and Operations Management*, 33(8):1719-1738, 2023. [\[Link\]](#)
6. M. Bodur, M. Cevik, A. A. Cire, Y. Lee, M. Ruschin. Multistage Fractionated Intensity Modulated Radiation Therapy Planning. *Computers & Operations Research*, 160: 106371, 2023. [\[Link\]](#)
7. N. Chen, A. A. Cire, M. Hu, S. Lagzi*. Model-free Assortment Pricing with Transaction Data. *Management Science*, 69(10):5840-5847, 2023. [\[Link\]](#)

8. M. Castro*, A. A. Cire, J.C. Beck. Decision Diagrams for Discrete Optimization: A Survey of Recent Advances. *INFORMS Journal on Computing*, 34(4):2271-2295, 2022 [\[Link\]](#)
9. M. Castro*, A. A. Cire, J.C. Beck. A Combinatorial Cut-and-Lift Procedure with an Application to 0-1 Second-Order Conic Programming. *Mathematical Programming*, 196, 115-171 (2022) [\[Link\]](#)
10. A. A. Cire, A. Diamant. Dynamic Scheduling of Home Care Patients to Medical Providers. *Production and Operations Management*, 31(11):4038-4056, 2022 [\[Link\]](#)
11. D. Bergman, M. Bodur, C. Cardonha, A. A. Cire. Network Models for Multiobjective Discrete Optimization. *INFORMS Journal on Computing*, 34:2, 990-1005, 2022 [\[Link\]](#)
12. S. Nadarajah, A. A. Cire. Network-Based Approximate Linear Programming for Discrete Optimization. *Operations Research*, 68(6):1767-1786, 2020. [\[Link\]](#)
13. J. Gonzales*, A. A. Cire, A. Lodi, L.-M. Rousseau. BDD-Based Optimization for the Quadratic Stable Set Problem. *Discrete Optimization*, in press, 2020. [\[Link\]](#)
14. M. Castro*, A. A. Cire, J.C. Beck. An MDD-based Lagrangian Approach to the Multi-Commodity Pickup-and-Delivery TSP. *INFORMS Journal on Computing*, 32(2): 263-278, 2020. [\[Link\]](#)
15. M. Castro*, C. Piacentini*, A. A. Cire, J.C. Beck. Solving Delete Free Planning with Relaxed Decision Diagram Based Heuristics. *Journal of Artificial Intelligence Research (JAIR)*, Vol. 67, 2020. [\[Link\]](#)
16. J. Gonzales*, A. A. Cire, A. Lodi, L.-M. Rousseau. Integrated Integer Programming and Decision Diagram Search Tree with an Application to the Maximum Independent Set Problem. *Constraints* 25, 23–46, 2020. [\[Link\]](#)
17. A. A. Cire, A. Diamant, T. H. Yunes, Alejandro Carrasco. A Network-Based Formulation for Scheduling Clinical Rotations. *Production and Operations Management*, 28: 1186-1205, 2019. [\[Link\]](#)
18. D. Bergman, C. Cardonha, A. A. Cire, A. Raghunathan. On the Minimum Chordal Completion Polytope. *Operations Research*, 67(2): 532-547, 2019. [\[Link\]](#)
19. D. Bergman, A. A. Cire. Discrete Nonlinear Optimization by State-Space Decompositions. *Management Science*, 64(10): 4700-4720, 2018. [\[Link\]](#)
20. J. Kinable*, A. A. Cire, W.-J. van Hoeve. Hybrid Optimization Methods for Time-Dependent Sequencing Problems. *European Journal of Operational Research*, 259(3): 887-897, 2017. [\[Link\]](#)
21. A. A. Cire, J. N. Hooker, Tallys Yunes. Modeling with Metaconstraints and Semantic Typing of Variables. *INFORMS Journal on Computing*, 28(1): 1-13, 2016. [\[Link\]](#)
22. A. A. Cire, E. Çoban, J. N. Hooker. Logic-based Benders Decomposition for Planning and Scheduling: A Computational Analysis. *Knowledge Engineering Review*, 31(5): 440-451, 2016. [\[Link\]](#)
23. D. Bergman, A. A. Cire. Theoretical Insights and Algorithmic Tools for Decision Diagram-based Optimization. *Constraints*, 21(4): 533-566, 2016. [\[Link\]](#)
24. D. Bergman, A. A. Cire, W.-J. van Hoeve, J. N. Hooker. Discrete Optimization with Decision Diagrams. *INFORMS Journal on Computing*, 28(1): 47-66, 2016. [\[Link\]](#)
25. D. Bergman, A. A. Cire, W.-J. van Hoeve. Lagrangian Bounds from Decision Diagrams. *Constraints*, 20(3): 346-361, 2015. [\[Link\]](#)
26. D. Bergman, A. A. Cire, W.-J. van Hoeve. MDD Propagation for Sequence Constraints. *Journal of Artificial Intelligence Research (JAIR)*, Vol. 50: 697-722, 2014. [\[Link\]](#)

27. D. Bergman, A. A. Cire, W.-J. van Hoeve, and T. Yunes. BDD-Based Heuristics for Binary Optimization. *Journal of Heuristics*, 20(2): 211-234, 2014. [\[Link\]](#)
28. A. A. Cire, W.-J. van Hoeve. Multivalued Decision Diagrams for Sequencing Problems. *Operations Research* 61(6): 1411-1428, 2013. [\[Link\]](#)
29. D. Bergman, A. A. Cire, W.-J. van Hoeve, J. N. Hooker. Optimization Bounds from Binary Decision Diagrams. *INFORMS Journal on Computing* 26(2): 253-258, 2014. [\[Link\]](#)
30. T. Lopes, A. Moura, C. de Souza, A. A. Cire. Planning the Operation of a Large Real-World Oil Pipeline. *Computers & Chemical Engineering*, Volume 46, 2012, pp. 17-28. [\[Link\]](#)
31. T. Lopes, A. A. Cire, C. de Souza, A. Moura. A Hybrid Model for a Multiproduct Pipeline Planning and Scheduling Problem. *Constraints* 15(2): 151-189, 2010. [\[Link\]](#)

Books

1. A. A. Cire. (editor). Integration of Constraint Programming, Artificial Intelligence, and Operations Research: 20th International Conference (CPAIOR 2023), Nice, France, May 29–June 1, 2023, Proceedings. Vol. 13884. Springer Nature, 2023.
2. D. Bergman, A. A. Cire, W.-J. van Hoeve, J. N. Hooker. **Decision Diagrams for Optimization**. Springer, 2016. [\[Link\]](#)

Peer-Reviewed Conference Proceedings

1. X. Guillard*, V. Coppé, P. Schaus, A.A. Cire. *Improving the filtering of Branch-and-Bound MDD Solver*. In *CPAIOR'21: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, 2021.
2. C. E. de Andrade, A.A. Mahimkar, R.K. Sinha, W. Zhang, A.A. Cire, G. Rana, Z. Ge, S. Puthenra, J. Yates, R. Riding. *Minimizing Effort and Risk with Network Change Deployment Planning*. In *Proceedings of the IFIP Networking Conference*, 2021.
3. Q. Cappart, T. Moisan, L.-M. Rousseau, I. Prémont-Schwarz, A.A. Cire. Combining Reinforcement Learning and Constraint Programming for Combinatorial Optimization. In *AAAI 2021: Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence*, 2021. [\[Link\]](#)
4. R.T. Icarte*, L. Illanes*, M. Castro*, A. A. Cire, S.A. McIlraith, J.C. Beck. Training Binarized Neural Networks using MIP and CP. In *CP'19: Proceedings of the Twenty-Fifth International Conference on Principles and Practice of Constraint Programming*, 2019. [\[Link\]](#)
5. A. Hosseininasab*, W.-J. van Hoeve, A.A. Cire. Constraint-based Sequential Pattern Mining with Decision Diagrams. In *AAAI 2019: Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence*, 2019. [\[Link\]](#)
6. M. Castro*, C. Piacentini*, A.A. Cire, J.C. Beck, Relaxed BDDs: An Admissible Heuristic for Delete-Free Planning Based on a Discrete Relaxation. In *ICAPS 2019: Proceedings of the Twenty-Ninth Conference on Automated Planning and Scheduling*, 2019. [\[Link\]](#)
7. M. Romer*, A.A. Cire, L.-M. Rousseau. A Local Search Framework for Compiling Relaxed Decision Diagrams. In *CPAIOR'18: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, 2018. [\[Link\]](#)
8. C. Piacentini*, M.P. Castro*, A. A. Cire, J.C. Beck. Compiling Optimal Numeric Planning to Mixed-Integer Linear Programming. In *ICAPS 2018: Proceedings of the Twenty-Eighth International Conference on Automated Planning and Scheduling*, 2018. [\[Link\]](#)
9. C. Piacentini*, M.P. Castro*, A. A. Cire, J.C. Beck. Linear and Integer Programming-based Heuristics for Cost-optimal Numeric Planning. In *AAAI 2018: Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence*, 2018. [\[Link\]](#)

10. O.S. Bajgiran*, A.A. Cire, L.-M. Rousseau. A First Look at Picking Dual Variables for Maximizing Reduced Cost Fixing. In *CPAIOR'17: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, 2017. [\[Link\]](#)
11. D. Bergman, A.A. Cire. On Finding the Optimal BDD Relaxation. In *CPAIOR'17: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, 2017. [\[Link\]](#)
12. B. Say*, A. A. Cire, J. C. Beck. Mathematical Programming Models for Optimizing Partial Order Plan Flexibility. In *ECAI 2016: Proceedings of the Twenty-Second European Conference on Artificial Intelligence*, 1044-1052, 2016. [\[Link\]](#)
13. D. Bergman, A. A. Cire. Multiobjective Optimization by Decision Diagrams. In *CP'16: Proceedings of the International Conference on Principles and Practice of Constraint Programming*, LNCS 9892, Springer, 2016. [\[Link\]](#)
14. D. Bergman, A. A. Cire. Decomposition Based on Decision Diagrams. In *CPAIOR'16: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, LNCS 9676. Springer, 2016. [\[Link\]](#)
15. D. Bergman, A. A. Cire, W.-J. van Hoeve. Improved Constraint Propagation via Lagrangian Decomposition. In *CP'15: Proceedings of the International Conference on Principles and Practice of Constraint Programming*, LNCS 9255, pp. 30-38. Springer, 2015. [\[Link\]](#)
16. A. Cire, S. Kadioglu, M. Sellmann. Parallel Restarted Search. In *AAAI'14: Proceedings of the Twenty-Eighth AAAI Conference on Artificial Intelligence*: pp 842-848, Springer, 2014. [\[Link\]](#)
17. D. Bergman, A. A. Cire, A. Sabharwal, H. Samulowitz, V. A. Saraswat, W.-J. van Hoeve. Parallel Combinatorial Optimization with Decision Diagrams. In *CPAIOR'14: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, LNCS 8451, pp. 351-367. Springer, 2014. [\[Link\]](#)
18. A. Cire, E. Coban, J. N. Hooker. Mixed Integer Programming vs. Logic-based Benders Decomposition for Planning and Scheduling. In *CPAIOR'13: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, LNCS 7874, pp. 325-331. Springer, 2013. [\[Link\]](#)
19. A. Cire and W.-J. van Hoeve. MDD Propagation for Disjunctive Scheduling. In *ICAPS'12: Proceedings of the International Conference on Automated Planning and Scheduling*, pp. 11-19. AAAI Press, 2012. [\[Link\]](#)
20. D. Bergman, A. A. Cire, W.-J. van Hoeve, J. N. Hooker. Variable Ordering for the Application of BDDs to the Maximum Independent Set Problem. In *CPAIOR'12: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, LNCS 7298, pp. 34-49. Springer, 2012. [\[Link\]](#)
21. A. Cire, E. Coban, W.-J. van Hoeve. Flow-Based Combinatorial Chance Constraints. In *CPAIOR'12: Proceedings of the International Conference on Integration of AI and OR Techniques in Constraint Programming*, LNCS 7298, pp. 129-145. Springer, 2012. [\[Link\]](#)
22. A. Botea, A. A. Cire. Incremental Heuristic Search for Planning with Temporally Extended Goals and Uncontrollable Events. In *IJCAI'09: Proceedings of the International Joint Conference on Artificial Intelligence*, Pasadena, USA, 2009. [\[Link\]](#)
23. A. Cire, A. Botea. Learning in Planning with Temporally Extended Goals and Uncontrollable Events. In *ECAI'08: Proceedings of the European Conference on Artificial Intelligence*, Patras, Greece, 2008. [\[Link\]](#)
24. T. Lopes, A. A. Cire, C. de Souza, A. Moura. Planning and Scheduling the Operation of a Very Large Oil Pipeline Network. In *CP'08: Proceedings of the International Conference on Principles and Practice of Constraint Programming*, LNCS 5202, pp. 36-51. Springer, 2008. [\[Link\]](#)

25. Moura, C. de Souza, A. A. Cire, T. Lopes. Heuristics and Constraint Programming Hybridizations for a Real Pipeline Planning and Scheduling Problem. In *CSE'08: Proceedings of the 11th IEEE International Conf. on Computational Science and Engineering*, pp. 455-462, 2008. [\[Link\]](#)

Papers in Media and Interviews

1. *How the Iran war oil crisis impacts Canadian energy prices and households*. Toronto Star, Business/Opinion (2026). Co-authored with Opher Baron. [\[Link\]](#)
2. *COVID-19 vaccines are being injected in Canada now, so when am I getting mine*. Toronto Star, Business/Opinion (2020). Co-authored with Sinem Savaser*, Opher Baron. [\[Link\]](#)
3. *Why do my holiday gifts often arrive late when I order online? The answer can be found in logistics*. Toronto Star, Business/Opinion (2019). Co-authored with Sinem Savaser*, Opher Baron. [\[Link\]](#)
4. *How UTSC is teaming up with community groups to bring better services to Scarborough's newcomers*. UTSC Communications, Interview (2018) [\[Link\]](#)

AWARDS AND HONORS

Awards

1. *Harvey J. Greenberg Research Award* 2024
INFORMS Computing Society
2. *INFORMS Computing Society Prize, Honourable Mention* 2023
INFORMS Computing Society
3. *Teaching Excellency Award* 2023
University of Toronto Scarborough
4. *Rotman Teaching Award* 2023, 2024
Rotman School of Management, University of Toronto
5. *Management's Teaching Excellence Award* 2020
Department of Management, University of Toronto Scarborough
6. *Research Excellence Award* 2019
Department of Management, University of Toronto Scarborough
7. *ACP Doctoral Dissertation Award* 2016
Association for Constraint Programming
8. *Gerald L. Thompson Doctoral Dissertation Award in Management Science* 2015
Carnegie Mellon University
9. *INFORMS Computing Society Best Student Paper Award* 2014
INFORMS Computing Society
10. *Egon Balas Award - Best Student Paper in Operations Research* 2011
Carnegie Mellon University
11. *William L. Mellon Fellowship* 2009-2011
Carnegie Mellon University
12. *Latin American Master's Thesis Contest in Informatics, Second Place* 2009
Latin American Center for Informatics Studies
13. *Best Paper Award, Applications Track* 2008
CP'08: The 14th International Conference on Principles and Practice of Constraint

- Programming
Paper title: Planning and Scheduling the Operation of a Very Large Oil Pipeline Network
14. *Scientific Initiation Prize, First Place* 2005
Brazilian Operational Research Society

Student Awards

1. MIP Best Poster Award, Honorable Mention 2025
Matheus Jun Ota (main supervisor: Ricardo Fukasawa)
The Mixed Integer Programming (MIP) Workshop
2. *Best Student Paper Award* 2021
Xavier Gillard, Ph.D. Student (main supervisor: Pierre Schaus)
CPAIOR'21: The 18th International Conference on the Integration of
Constraint Programming, Artificial Intelligence, and Operations Research
Paper title: Improving the Filtering of Branch-and-bound MDD Solvers
3. *First Place, Supply Chain & Logistics Management Best Student Research Paper* 2021
Sinem Kinay, Ph.D. student (also co-supervised by Prof O. Baron)
Centre for Research in Sustainable Supply Chain Analytics, Dalhousie University
4. *Runner-up, Canadian Operations Research Society Best Student Paper Award* 2021
Saman Lagzi, Ph.D. student (also co-supervised by Profs Ningyuan Chen, Ming Hu)
5. *First Place, Canadian Operations Research Society Best Student Paper Award* 2020
Margarita Castro, Ph.D. student (also co-supervised by Prof J. C. Beck)
6. *Runner-up, INFORMS Computing Society Best Student Paper Award* 2020
Margarita Castro, Ph.D. student (also co-supervised by Prof J. C. Beck)

Grants

1. *NSERC Discovery Grant* 2026-2031
Natural Sciences and Engineering Research Council of Canada
Project title: Coupling in Optimization: Models, Theory, and Algorithms
2. *NSERC Discovery Grant* 2020-2026
Natural Sciences and Engineering Research Council of Canada
Project title: Network-based Models for Scheduling Under Uncertainty
3. *MITACS: Search Engine Optimization from Product Images* 2023-2024
MITACS Accelerate, Artificial Intelligence
4. *MITACS: Expanding Sustainable Commuting Designation Across Canada* 2023-2024
MITACS Business Strategy Internship
Partnering Company: pointA
5. *CIHR: Addressing the Wider Health Impacts of COVID-19 (Group grant)* 2022-2024
Canadian Institutes of Health Research
Role: Co-applicant (led by York University, Ontario Health)
Project: Understanding How COVID-19 has Affected Hospital Performance
6. *Suburban Mobilities Cluster of Scholarly Prominence (Cluster grant)* 2020-2023
University of Toronto Scarborough
Role: Cluster Team Member (Cluster lead: Prof. Steven Farber)
Project: Joint grant involving faculty from the Dept. of Management, Human Geography,
Sociology, Public Health, and Political Sciences to investigate social and transportation
suburban problems

7. *NSERC Discovery Grant* 2015-2020
Natural Sciences and Engineering Research Council of Canada
Project title: Optimization with Decision Diagrams: Theory and Applications
8. *NSERC Engage Grant* 2018
Natural Sciences and Engineering Research Council of Canada
Project title: Data Analytics for Ore Blending Schedules
9. *Connaught Research Award* 2016-2017
University of Toronto
Project title: Decision Analytics for Home Health Care
10. *UTSC Research Competitiveness Fund* 2014
University of Toronto Scarborough
Project title: New Optimization Methods based on Decision Diagrams for Planning and Scheduling

INTERNSHIPS AND VISITING POSITIONS

1. *IBM Research, Yorktown Heights, USA* Summer 2013
Internship at the AI for Optimization Group
Project: Lagrangian and Parallel methods for Large-scale Integer Programming
2. *Google, California, USA* July 2012
Research Visitor, Optimization Group
3. *Zuze Institute Berlin (ZIB), Berlin, Germany* Summer 2010
Research Visitor
Project: Operational Planning for Home Health Care
4. *Australian National University / NICTA, Canberra, Australia* Summer 2007
Internship at the Knowledge and Representation Group, NICTA
Project: Model-based Supervision of Composite Systems

TALKS

Conference and Workshop Talks

1. INFORMS Optimization Society Conference 2026. *Delayed Allocation in Marginalized Flow Models for Weakly Coupled Dynamic Programs*. Atlanta, GA, 2025. Invited talk.
2. INFORMS Annual Meeting 2025. *Leveraging Decoupling in Robust Network Rebalancing*. Atlanta, GA, 2025. Invited talk.
3. INFORMS Annual Meeting 2024. *Beyond the Scores: Incorporating Chance in Sequential Admission Processes*. Seattle, WA, 2024. Invited talk.
4. INFORMS Optimization Society, 2024. *Self-adapting Networks for Weakly Coupled Markov Decision Processes*. Houston, TX, 2024. Invited talk.
5. INFORMS Annual Meeting 2023. *Network Models for Centralized Surgical Scheduling..* Phoenix, AZ, 2023. Invited talk.
6. INFORMS Healthcare Conference 2023. *Network Models for Centralized Surgical Scheduling*. Toronto, ON, 2023. Invited talk.
7. CPAIOR 2022, Keynote Speaker. *Network Models for Optimization*. Los Angeles, CA, 2022

8. INFORMS Annual Meeting 2022. *Self-adapting Networks for Weakly Coupled Markov Decision Processes*. Indianapolis, IN, 2022. Invited Talk.
9. INFORMS Annual Meeting 2019. *Network-based Formulation for Scheduling Clinical Rotations*. Seattle, WC, 2019. Invited Talk.
10. Production and Operations Management Conference 2019. *Network-based Formulation for Scheduling Clinical Rotations*. Washington, D.C., 2019. Session Chair.
11. Production and Operations Management Conference 2019. *Dynamic Scheduling of Home Health Care Patients to Medical Providers*. Washington, D.C., 2019. Invited Talk.
12. INFORMS Computing Society Conference 2019. *Stochastic Task Scheduling with Heterogeneous Agents*. Knoxville, TN, 2019. Invited Talk.
13. INFORMS Annual Meeting 2018. *Network-based Approximate Linear Programming*. Phoenix, AZ, 2018. Invited Talk.
14. Canadian Operational Research Society (CORS) 2018. *Network-based Approximate Linear Programming for Discrete Optimization*. Halifax, NS, 2018. Invited Talk.
15. International Symposium on Mathematical Programming (ISMP 2018). *Nonlinear State-Space Decompositions*, Bordeaux, France, 2018. Invited Talk.
16. INFORMS Annual Meeting 2017. *Dynamic Scheduling of Home Care Patients to Medical Providers*. Houston, TX, 2018. Invited Talk.
17. INFORMS Annual Meeting 2017. *Maximizing Reduced-cost-based Fixing*. Houston, TX, 2018. Invited Talk.
18. IFORS 2017. *A Decision Diagram-based Lagrangian Approach to the One-to-one Multi-commodity Pickup and Delivery Traveling Salesman Problem*. Québec City, QC, 2017. Invited Talk.
19. IFORS 2017. *Dynamic Scheduling of Home Care Patients to Medical Providers*. Québec City, QC, 2017. Invited Talk.
20. INFORMS Computing Society Conference 2017, *Dynamic Scheduling of Home Health Care Patients*, Austin, TX, 2017. Invited Talk.
21. INFORMS Annual Meeting 2016, *Decomposition by Decision Diagrams*, Nashville, TN, 2016. Invited Talk.
22. INFORMS Optimization Society Conference, *Decision Diagrams for Scheduling*, Princeton, NJ, 2016. Invited Talk.
23. Mixed Integer Programming Workshop (MIP), *Decision Diagrams for Optimization*, Chicago, IL, 2015. Invited Talk.
24. International Symposium on Optimization (ISMP), *Lagrangian Relaxation based on Decision Diagrams*, Pittsburgh, PA, 2015. Invited Talk.
25. Joint International Meeting of the Canadian Operational Research Society (CORS), *Lagrangian Relaxation Based on Decision Diagrams*, Montréal, QC, 2014. Invited Talk.
26. INFORMS Annual Meeting, *Improving Constraint Propagation via Lagrangian Decomposition*, Philadelphia, PA, 2015. Invited Talk.
27. INFORMS Computing Society Conference. *Relaxations from Multiple Decision Diagrams*. Richmond, VA, 2015. Invited Talk.
28. INFORMS Annual Meeting. *MDD-Based Lagrangian Relaxation*, Richmond, VA, 2014. Invited Talk.
29. INFORMS Annual Meeting. *Decision Diagrams for Sequencing and Scheduling*. Minneapolis, MN, 2013. Invited Talk.

30. INFORMS Annual Meeting. *A Branch and Bound Algorithm Based on Approximate Binary Decision Diagrams*. Phoenix, AZ, 2012. Invited Talk.
31. 21st International Symposium on Mathematical Programming (ISMP 2012). *MDD Propagation for Disjunctive Scheduling*. Berlin, Germany, 2012. Invited Talk.
32. 54th Annual Conference of the Canadian Operations Research Society (CORS 2012). *MDD Propagation for Disjunctive Scheduling*. Niagara Falls, Canada, 2012. Invited Talk.
33. INFORMS Annual Meeting. *Multivalued Decision Diagrams Relaxation for the Maximum Independent Set Problem*. Charlotte, NC, 2011. Invited Talk.
34. INFORMS Annual Meeting. *Logic-Based Benders Decomposition for the Home Health Care Problem*, Austin, TX, 2010. Invited Talk.
35. INFORMS Annual Meeting, *Hybrid Models for Scheduling a Real Oil Pipeline Network*. Washington, D.C., 2008. Invited Talk.

Invited Speaker in University/Industry Seminars

1. Round Table on Data Analytics in Healthcare, Rotman School of Management. *Network Models for Centralized Surgical Scheduling*, Invited Speaker, 2023.
2. Amazon Speaker Series. *Decision Diagrams for Optimization*. Invited Speaker, 2021.
3. Round Table on Data Analytics in Healthcare, Rotman School of Management. *Dynamic Scheduling of Home Health Care Patients to Medical Providers*, Invited Speaker, 2018.
4. CIRRELT Invited Speaker Series. *Dynamic Scheduling of Home Health Care Patients*. Invited Seminar Speaker, Université de Montréal, 2017.
5. DeGroote School of Management, McMaster University. *Decision Diagrams for Optimization*, Invited Seminar Speaker, 2017.
6. CIRRELT Seminar. *Decision Diagrams for Sequencing and Scheduling Problems*, Invited Seminar Speaker, Université de Montréal, 2015.
7. Combinatorics and Optimization, University of Waterloo, *Optimization based on Decision Diagrams*, Invited Seminar Speaker, 2015.

STUDENTS AND POSTDOCTORAL FELLOWS

Ph.D. Students

1. *Seyedeh Parisa Moosavi* 2024 - ongoing
Project co-supervised with Dr. Selvaprabu Nadarajah (University of Illinois at Chicago)
Topic: Coupled Dynamic Programming: Theory and Methodology
2. *Sinem Kinay Savaser* 2024
Co-supervised with Dr. Opher Baron (University of Toronto)
Topic: Order Fulfillment and Inventory Problems of Omni-Channel Retailers
First position after completion: Research Scientist, Amazon.
3. *Saman Lagzi (one dissertation chapter)* 2022
Main supervisors: Dr. M. Hu, Dr. N. Chen, Dr. G. Romero (University of Toronto)
Topic: Revenue Management and Pricing
First position after completion: Assistant Professor, UNC Kenan–Flagler Business School

4. *Margarita Castro* 2015 - 2020
Co-supervised with Dr. J. Christopher Beck (University of Toronto)
Topic: Decision Diagrams for Planning, Scheduling, and Routing.
First position after completion: Assistant Professor, Pontificia Universidad Católica de Chile
5. *Jaime Esteban Gonzales Jurado* 2016- 2020
Co-supervised with Dr. Andrea Lodi and Dr. Louis-Martin Rousseau (Université de Montréal)
Topic: Hybrid Machine Learning and Decision Diagram Techniques
First position after completion: FICO, Operations Research Scientist

MSc. Students

6. *Lucas Barbosa Zattar Paganin* 2020 – 2021
Co-supervised with Dr. V. Sarhangian (University of Toronto)
Topic: Integrated Modelling of Statistical Process Control and Maintenance
First position after completion: Project Manager, BASSETTI Americas (Montréal, Quebec)
7. *Buser Say* 2014 – 2015
Co-supervised with Dr. J. Christopher Beck (University of Toronto)
Topic: Mathematical Programming Methods for Planning
First position after completion: Ph.D. student, University of Toronto (Computer Science Dept. and the Vector Institute)

Post-doctoral Fellows

8. *Danielle Ripsman* 2024-2025
Co-supervised with Dr. Adam Diamant (York Univ.)
Topic: Combinatorial fluid models
First position after completion: Malone Postdoctoral Fellow, Johns Hopkins University
9. *Su Li* 2024-2025
Co-supervised with Dr. Vahid Sarhangian (MIE, UofT) and Dr. Adam Diamant (York Univ.)
Topic: Markov Decision Process Approximations
First position after completion: Postdoctoral Fellow, Rice University
10. *Uta Mohring* 2022-2024
Co-supervised with Dr. Philipp Afeche (Rotman)
Topic: On-demand Transportation
First position after completion: Assistant Professor, University of Zurich (Switzerland)
11. *Alireza Ghahtarani* 2023-2024
Co-supervised with Dr. Vahid Sarhangian (MIE, UofT)
Topic: Optimization under Uncertainty for Resource Staffing
Expected Completion: August 2024
12. *Aliaa Alnaggar* 2021-2023
Co-supervised with Dr. Adam Diamant (York University)
Topic: Distributionally Robust Optimization Methods for Network Rebalancing
First position after completion: Assistant Professor, Toronto Metropolitan University
13. *Eugene Furman* 2020-2021
Co-supervised with Dr. Opher Baron (Rotman), Dr. Adam Diamant (York Univ.)
Topic: Healthcare Analytics, Optimization Methods for Queuing Theory
First position after completion: Postdoctoral fellow, University of Toronto

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| 14. | <i>Michael Römer</i>
Co-supervised with Dr. Louis-Martin Rousseau (Université de Montréal)
<u>Topic:</u> Search-based techniques based on Network Reformulations
<u>First position after completion:</u> Assistant Professor, Martin Luther Universität Halle Wittenberg (Germany) | 2017-2019 |
| 15. | <i>Omid Sanei Bajgiran</i>
Co-supervised with Dr. Louis-Martin Rousseau (Université de Montréal)
<u>Topic:</u> Dual-based Search and Fixing Methods for Mathematical Programming
<u>First position after completion:</u> Bank of Montréal (BMO), Senior Data Scientist. | 2016-2017 |

ACADEMIC SERVICE

Society Services

- | | | |
|----|---|--------------|
| 1. | <i>Board Member, INFORMS Computing Society</i>
Elected for 2023-2024 period. | 2023-2024 |
| 2. | <i>Council Member, Healthcare Special Interest Group, CORS</i>
Canadian Operations Research Society (CORS) | 2022-current |

Editorial Services

- | | | |
|----|--|--------------|
| 1. | <i>Associated Editor, INFORMS Journal on Computing</i>
Network Optimization: Algorithms & Applications | 2021-Present |
| 2. | <i>Ad-hoc Associated Editor, Naval Research Logistics</i>
Optimization | 2022-Present |
| 3. | <i>Ad-hoc reviewer</i>
Management Science, Operations Research, Mathematical Programming, INFORMS Journal on Computing, Manufacturing & Service Operations Management, Networks, Naval Research Logistics, Computers & Operations Research, Information System and Operational Research (INFOR), Transportation Research, MITACS Accelerate, NSERC Discovery Grant. | |

Senior/Chair Roles in Conferences and Workshops

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|----|---|-----------|
| 1. | <i>Conference Chair, ICS 2025</i>
INFORMS Computing Society Conference | 2025 |
| 2. | <i>Area Chair, NeurIPS 2024</i>
Conference on Neural Information Processing Systems | 2024 |
| 3. | <i>Program Chair, CPAIOR-2023</i>
International Conference on the Integration of CP, AI, and OR | 2022-2023 |
| 4. | <i>Conference Chair, CP-2023</i>
International Conference on Principles and Practice of Constraint Programming | 2022-2023 |
| 5. | <i>Area Chair (Optimization and Constraint Satisfaction), AAAI Conference</i>
AAAI Conference on Artificial Intelligence (2021, 2023) | 2020-2023 |
| 6. | <i>Chair, CORS Undergraduate Student Competition</i>
Canadian Operational Research Society | 2021-2023 |
| 7. | <i>Chair, Canadian Healthcare Optimization Workshop</i>
Co-chaired with Prof. Adam Diamant (York University)
Event co-allocated with the Canadian Operations Research Society (CORS) Annual Meeting | 2020 |

- The event was postponed to 2021 due to COVID-19.
8. *Cluster Chair, Decision Diagram Track* 2019
16th INFORMS Computing Society Conference
 9. *Chair, Symposium for Decision Diagrams for Optimization* 2018
Carnegie Mellon University, Pittsburgh, USA
 10. *Chair, Operations Research Track* 2017-2018
International Conference on Principles and Practice of Constraint Programming (CP)
 11. *Chair – Planning, Search, and Optimization Workshop (PlanSOpt)* 2018
28th International Conference on Automated Planning and Scheduling (ICAPS)
Co-chaired with Dr. Michael Cashmore (King's College London) and Chiara Piacentini (Augmenta AI)
 12. *Chair, Doctoral Research Award in Constraint Programming* 2018
Association for Constraint Programming
 13. *Chair, ACP Summer School on Constraint Programming* 2016, 2022
Association for Constraint Programming
Co-chaired with Prof. David Bergman (University of Connecticut)

Program Committees

1. International Conference on Machine Learning (ICML) 2020-25
2. Conference on Neural Information Processing Systems (NeurIPS) 2020-25
3. AAAI Conference on Artificial Intelligence (AAAI) 2015-25
4. Int. Conference on Integration of AI and OR Techniques in CP (CPAIOR) 2015-25
5. Int. Conference on Principles and Practice of Constraint Programming (CP) 2017-25
6. Int. Conference on Machine Learning, Optimization, and Data Science (LOD) 2022
7. Int.Joint Conference on Artificial Intelligence (IJCAI) 2013, 2015-24
8. Int. Conference on Automated Planning and Scheduling (ICAPS) 2018-24
9. Learning and Intelligent Optimization Conference (LION) 2016-18
10. Int. Conference on Operations Research and Enterprise Systems (ICORES) 2017-2020
11. Doctoral Program, CP 2015-16

Memberships

1. INFORMS Senior Membership 2025

UNIVERSITY SERVICE

Administrative Service

1. *Associate Chair, Research, Strategic Initiatives, and External Relations* 2024-present
Department of Management, University of Toronto Scarborough
2. *Associate Chair, Strategic Initiatives and External Relations* 2023-2024
Department of Management, University of Toronto Scarborough
3. *Academic Director, BRIDGE* 2021-2022
Department of Management, University of Toronto Scarborough
4. *Committee Member, Oded Berman Ph.D. Award* 2023
Rotman School of Management, University of Toronto

5. *Teaching Committee* 2021-present
Department of Management, University of Toronto Scarborough
6. *Job Search Committee Member, Operations & Analytics Area* 2019-2020, 2023-24
Department of Management, University of Toronto Scarborough
7. *Core-Review Committee Member* 2019-2021
Department of Management, University of Toronto Scarborough
8. *Newcomers Needs and Trends Initiative, Data Analysis* 2018-present
Department of Management, University of Toronto Scarborough
Toronto East Quadrant Local Immigration Partnership (TEQ-LIP)
 - **Role:** The project's objective is to collect, organize, and analyze data provided by refugee agencies in Scarborough. Our goal is to identify newcomer trends, patterns of service access, and other insight to support agencies in improving their services. The project is a collaboration between the TEQ-LIP and the Business, Research, and Innovation (BRIDGE) lab at the Department of Management, UTSC. My role includes data collection, analytics training to agencies via free workshops, support of co-op students, reporting, and data visualization. Since its inception, the project already includes approximately 19 newcomer agencies and considers analysis of more than 100,000 service accesses since 2018.
9. *Interviews - Management and International Business (MIB) Co-op Program* 2016-2020
Department of Management, University of Toronto Scarborough
10. *Interviews – Master of Management Analytics* 2018-2019
Rotman School of Management
11. *Faculty Coaching - Master of Management Analytics (MMA) Analytics Practicum* 2018
Rotman School of Management
12. *Faculty Coaching – Master of Management Analytics (MMA) Datathon* 2018
Rotman School of Management
13. *Judge - LIVE - Future Leaders Challenge* 2017
Department of Management, University of Toronto Scarborough

Ph.D. Thesis Examiner

1. Berk Gorgulu 2023
University of Toronto
2. Carolina Riascos-Álvarez 2023
University of Toronto
3. Xavier Gillard 2022
Université Catholique de Louvain
4. Amin Hosseinasab 2020
Carnegie Mellon University
5. Buser Say 2020
University of Toronto
6. Longyuan Du 2018
University of Toronto
7. Wen-Yang Ku 2017
University of Toronto

Ph.D. Committee Meetings

1. Gueng Guo 2019, 2020

- University of Toronto
2. Maryam Daryalal
University of Toronto 2019

MSc Thesis Examiner

1. Tanya Tang
University of Toronto 2020
2. Leyi Chang
University of Toronto 2019
3. Stefana Filipova
University of Toronto 2018

TEACHING

Undergraduate Courses

1. **Introductory/Advanced Business Data Analytics (MGOC15 / MGOD30H3 / MGOD31H)**
Department of Management, University of Toronto Scarborough
Audience: 3rd – 4th-year students (D-level course)
 - Summary: The course provides skills in data manipulation, data cleaning, and predictive models (such as decision trees, random forests, and neural networks) for Management students, emphasizing managerial insights and principles of evidence-based decision making.
 - Terms Taught: Winter 2018 , Winter 2019, Summer 2019, Winter 2020, Summer 2020, Summer 2021, Winter 2022
 - Fully designed course curriculum and lecture notes.
2. **Operations Management: A Mathematical Approach (MGOC20H3)**
Department of Management, University of Toronto Scarborough
Audience: 2nd – 4th-year students (C-level course)
 - Summary: The course provides skills in practical quantitative approaches to assess and improve upon decisions underlying the strategic goals of a firm. Topics include project management, forecasting, total quality, supply chain, inventory management, and basics of revenue management.
 - Terms Taught: Fall 2016, Winter 2018
 - Redesigned course material (lecture notes)
3. **Analysis for Decision Making (MGOC10H3)**
Department of Management, University of Toronto Scarborough
Audience: 2nd – 4th-year students (C-level course)
 - Summary: The course provides skills in prescriptive analytics models to enhance decision making and analysis of outcomes. Topics include decision analysis, mathematical programming, multi-criteria decision making, and queuing models using Excel.
 - Terms: Fall 2014, Fall 2015
 - Redesigned course material (lecture notes)
4. **Mathematical Models for Consulting,**
Tepper School of Business, Carnegie Mellon University
Course taught during my Ph.D. and before joining the University of Toronto Scarborough

- Summary: The course provides skills in mathematical programming techniques for decision making, including linear and integer programming.
- Audience: 4th-year students
- Terms Taught: Spring 2013

Graduate Courses

1. **Optimizing Supply Chain and Logistics Analytics**
Rotman School of Management, University of Toronto
Audience: Master of Management Analytics (MMA)
 - Summary: The course provides optimization skills in supply chain operations, and topics include network design, aggregate planning, routing, and pricing.
 - Terms Taught/Evaluations: Fall 2021, Fall 2022
 - Designed new lecture notes based on existing material .
2. **Business Data Analytics (MAF3003H3)**
Department of Management, University of Toronto Scarborough
Audience: Master of Accounting and Finance (MaccFin) students
 - Summary: The course provides skills in data manipulation, data cleaning, and predictive models emphasizing applications in Accounting and Finance.
 - Terms Taught/Evaluations: Summer 2019, Summer 2020
 - Designed course curriculum and lecture notes.
3. **Duality in Optimization** (Advanced Methods in Linear and Non-linear Optimization, RSM3046)
Rotman School of Management, University of Toronto
Audience: Ph.D. students in Operations
 - Summary: The course investigates the use of duality in optimization and classical results in the field, including topics in polyhedral analysis, convex analysis, and decomposition methods.
 - Terms Taught: Winter 2018, Fall 2021, Winter 2024
 - Designed course curriculum and lecture notes.