JUSTIN DUMOUCHELLE

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EDUCATION

University of Toronto 2021 - 2025
PhD in Operations Research & Machine Learning
Advisor: Elias Khalil

Polytechnique Montréal 2019 - 2021
MASc in Applied Mathematics
Advisors: Andrea Lodi, Emma Frejinger

University of Waterloo 2013 - 2018
BMath (double major) in Computer Science, Combinatorics and Optimization

RESEARCH INTERESTS

Methodology: Operations research, data-driven optimization, discrete optimization, optimization under uncertainty, machine learning
Applications: Transportation, logistics, sustainability, healthcare

PUBLICATIONS

Under Review

[1] **J. Dumouchelle**, E. Julien, J. Kurtz, and E. B. Khalil. Deep Learning for Two-Stage Robust Integer Optimization. Submitted to *Operations Research*, 2024.
- Extends [3] with benchmarks, methodology, computational improvements, and theory
- [**Paper**] [**Website**]

Conference Papers

[2] **J. Dumouchelle**, E. Julien, J. Kurtz, and E. B. Khalil. Neur2BiLO: Neural Bilevel Optimization. *Advances in Neural Information Processing Systems*, 2024.
- [**Paper**] [**Code**] [**Website**]

[3] **J. Dumouchelle**, E. Julien, J. Kurtz, and E. B. Khalil. Neur2RO: Neural Two-Stage Robust Optimization. *International Conference on Learning Representations*, 2024.
- [**Paper**] [**Code**] [**Website**]

[4] **J. Dumouchelle***, R. Patel*, E. B. Khalil, and M. Bodur. Neur2SP: Neural Two-Stage Stochastic Programming. *Advances in Neural Information Processing Systems*, 2022.
- [**Paper**] [**Code**] [**Website**]

Journal Papers

[5] **J. Dumouchelle**, E. Frejinger, and A. Lodi. Reinforcement Learning for Freight Booking Control Problems. *Journal of Revenue and Pricing Management*, 2024.
- [**Paper**] [**Code**]

[6] M. Gasse, S. Bowly, Q. Cappart, J. Charfreitag, L. Charlin, D. Chételat, A. Chmiela, **J. Dumouchelle**, ..., and M. Kun. The machine learning for combinatorial optimization competition (ML4CO): Results and insights. *Proceedings of the NeurIPS* 2021 *Competitions and Demonstrations Track*, in *Proceedings of Machine Learning Research (PMLR)*, 2022.
- [**Paper**] [**Website**]

* denotes equal contribution

Workshop Papers

[7] A. Prouvost, **J. Dumouchelle**, L. Scavuzzo, M. Gasse, D. Chételat, and A. Lodi. Ecole: A gym-like library for machine learning in combinatorial optimization solvers. *Learning Meets Combinatorial Algorithms at NeurIPS2020*, 2020.
• [**Paper**] [**Code**] [**Website**]

PROFESSIONAL EXPERIENCE

Borealis AI - RBC July 2018 - August 2019
Machine Leaning Research Intern *Montréal, QC*

- **Time Series Prediction**: Developed data prepossessing pipeline and supervised deep learning models for time series forecasting
- **Natural Language Processing**: Implemented distant supervision and supervised learning techniques to extract numerical data from unstructured text
- **Communication**: Communicated scientific topics, i.e., machine learning, to non-expert departments within RBC to plan and develop machine learning systems for financial applications

TALKS & PRESENTATIONS

Invited Talks

- INFORMS Annual Meeting, October 2024
- International Symposium on Mathematical Programming (ISMP), July 2024
- Data Science for Decision Making Coffee Talks, University of Montréal, March 2024
- AI Seminar, University of Toronto, February 2024
- Robust Optimization Webinar (ROW), December 2023 [**Video**]
- INFORMS Annual Meeting, October 2023

Contributed Talks

- Mechanical & Industrial Engineering Research Symposium, September 2024
- International Conference on Stochastic Programming (ICSP), July 2023

Poster Presentations

- Princeton Workshop on Optimization, Learning, and Control, June 2024
- AAAI Leanopt Workshop, February 2024
- INFORMS Poster Competition, (**1st Place, People's Choice Track**), October 2023
- Mixed Integer Programming Workshop, May 2023
- Vector Institute Research Symposium, May 2023

Guest Lectures

- Machine Learning Applications for Supply Chain Management, MIT, April 2023

TEACHING EXPERIENCE

University of Toronto
Teaching Assistant

- Data Structures and Algorithms (MIE245), Tutorial TA, Winter 2024
  Average Rating: n/a
- Algorithms and Numerical Methods (MIE335), Tutorial TA, Winter 2023
  Average Rating: 4.97/5.0
  Nominated for departmental teaching assistant award

University of Waterloo
Private Tutor

- Algorithm Design and Analysis (CS 466/666), Fall 2018
- Data Structures and Algorithms (MTE 140), Winter 2018

AWARDS

- Ontario Graduate Scholarship × 2, 2023-2025
- 1st place poster award (People's Choice Track) at the INFORMS annual meeting poster competition among hundreds of submissions, 2023 [**Poster**]

ACADEMIC SERVICE

- Editor for OR/MS Tomorrow
- Top Reviewer at NeurIPS 2024 (top 8% of reviewers)
- Reviewing: NeurIPS, ICLR, AISTATS, INFORMS Journal of Computing, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Network Science and Engineering, Journal of Revenue and Pricing Management, Sampling and Optimization in Discrete Spaces (SODS) workshop at ICML
- Organizer: NeurIPS 2021 Competition on Machine Learning for Combinatorial Optimization
- Session Chair: ISMP 2024

EXTRACURRICULAR

University of Waterloo Varsity Swimming 2013-2018

- Captain for the 2016-2017 and 2017-2018 seasons
- 2017 and 2018 Academic All Canadian