

# Connor Lawless

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CONTACT	Cornell University Operations Research & Information Engineering 294 Rhodes Hall, 136 Hoy Road, Ithaca, NY 14853	<a href="mailto:cal379@cornell.edu">cal379@cornell.edu</a> <a href="https://conlaw.github.io">https://conlaw.github.io</a>
RESEARCH INTERESTS	My research interests lie at the intersection of <i>computational integer programming and interpretable and fair machine learning</i> .	
EDUCATION	<b>Cornell University</b> Ph.D. in <b>Operations Research and Information Engineering</b> M.S. in <b>Operations Research and Information Engineering</b> - PhD Advisor: <b>Oktay Günlük</b> - Thesis: Integer Programming Approaches for Trustworthy Machine Learning	<i>Ithaca, NY</i> <i>May 2024, expected</i> <i>December 2022</i>
	<b>University of Toronto</b> B.A.Sc. in <b>Industrial Engineering</b> , <i>High Honors</i>	<i>Toronto, ON</i> <i>April 2019</i>
WORKING PAPERS	<b>Preference Embedding from Chat: A Hybrid LLM and Constraint Programming Framework for Interactive Optimization</b> <b>Connor Lawless</b> , Jakob Schoeffer, Kael Rowan, Bahar Sarrafzadeh, Shilad Sen, Jina Suh <i>In preparation for ACM CHI Conference on Human Factors in Computing Systems.</i>	
	<b>Cluster Explanations via Polyhedral Descriptions: A Scalable Column Generation Framework</b> <b>Connor Lawless</b> , Oktay Günlük <i>In preparation for Operations Research</i>	
	<b>Fair Minimum Representation Clustering</b> <b>Connor Lawless</b> , Oktay Günlük <i>Under review</i>	
PUBLICATIONS	<b>Interpretable and Fair Decision Rules via Column Generation</b> <b>Connor Lawless</b> , Sanjeeb Dash, Oktay Günlük, Dennis Wei <i>Journal of Machine Learning Research (2023)</i>	
	<b>Cluster Explanation via Polyhedral Description</b> <b>Connor Lawless</b> , Oktay Günlük <i>International Conference on Machine Learning (2023)</i>	
	<b>Interpretable Clustering via Multi-Polytope Machines</b> <b>Connor Lawless</b> , Jayant Kalagnanam, Lam Nguyen, Dzung T. Phan, Chandra Reddy <i>AAAI Conference on Artificial Intelligence (2022)</i>	
	<b>Two-Stage Approach to Routing with Driver Preferences via Heatmaps</b> <b>Connor Lawless</b> , Sotiris Ntanasaras, Anders Wikum <i>Proceedings of the Amazon-MIT Last Mile Vehicle Routing Challenge (2022)</i>	
	<b>Fair and Interpretable Decision Rules for Binary Classification</b> <b>Connor Lawless</b> , Oktay Günlük <i>NeurIPS Workshop on Optimization in Machine Learning (2020)</i> <i>IJCAI Workshop on AI for Social Good (2021)</i>	
PATENTS	<b>Trade Platform with Reinforcement Learning</b> Hasham Burhani, Shary Mudassir, Xiao Qi Shi, <b>Connor Lawless</b> <i>US Patent, Granted in 2023</i>	

## Interpretable Clustering via Multi-Polytope Machines

Dzung T. Phan, **Connor Lawless**, Jayant R. Kalagnanam, Lam M. Nguyen, Chandra K. Reddy  
*Patent Application in US (2021)*

### ACADEMIC PRESENTATIONS

#### Cluster Explanation via Polyhedral Description

- Cornell ORIE PhD Colloquium, Ithaca NY *September 2022*
- Making Sense of Explainable ML, Lorentz Center at the University of Leiden *October 2022*
- Fidelity AI Center Seminar, Remote *April 2023*
- Thematic Einstein Seminar on Optimization and ML, Berlin Germany *April 2023*
- NYC Operations Day (Poster), NYC NY *April 2023*
- SIAM Optimization Conference, Seattle WA *May 2023*
- International Federation of Operations Research Society Meeting, Santiago Chile *July 2023*
- ICML (Poster), Honolulu HI *July 2023*

#### Fair Minimum Representation Clustering

- NYC Joint PhD Colloquium *May 2023*

#### Interpretable Clustering via Multi-Polytope Machines

- IBM Research Applied AI Seminar, Remote *August 2021*
- Cornell ORIE PhD Colloquium, Ithaca NY *October 2021*
- INFORMs Optimization Society, Greenville SC *March 2022*
- European Conference on Operational Research, Espoo Finland *July 2022*

#### Fair and Interpretable Decision Rules for Binary Classification

- ORACL Workshop, Cornell University *June 2019*
- AI for Social Good Workshop, IJCAI (Remote) *January 2021*
- Machine Learning NeEDs Mathematical Optimization Seminar Series *February 2021*
- European Conference on Operational Research (Remote) *July 2021*
- INFORMs, Anaheim CA *October 2021*

### TEACHING EXPERIENCE

<b>Instructor</b>	ORIE 5270: Big Data Technologies, <i>Spring 2023 - Cornell</i> Teaching Effectiveness: 4.45/5 (Dept. Avg.: 3.99)
<b>Instructor</b>	ORIE 6125: Computational Methods in OR, <i>Spring 2023 - Cornell</i> Teaching Effectiveness: 4.63/5 (Dept. Avg.: 3.99)
<b>Instructor</b>	<b>Data Analytics</b> 2021-2022 - <i>iXperience</i> Teacher Rating: 4.9/5 (Fall '21), 5/5 (Spring '22)
<b>Teaching Assistant</b>	ORIE 5135: Computational IP, <i>Spring 2022 - Cornell</i>
<b>Teaching Assistant</b>	ORIE 4740: Learning with Big Messy Data, <i>Fall 2021 - Cornell</i>
<b>Instructor</b>	<b>Data Science Bootcamp</b> 2020 - 2021 <i>iXperience</i> Teacher Rating: 4.9/5 (Summer '20), 4.9/5 (Winter '21)
<b>Guest Lecturer</b>	ORIE 6140: Mathematical Modeling for OR, <i>Fall 2020 - Cornell</i>
<b>Teaching Assistant</b>	ORIE 3300: Optimization I, <i>Fall 2019 - Cornell</i>
<b>Guest Lecturer</b>	ENGRI 1101: Engineer Applications of OR, <i>Fall 2019 - Cornell</i>

### HONOURS

Outstanding Graduate Instructor, Cornell ORIE	<i>2023</i>
Michigan Institute for Data Science Future Leaders Summit Selected Attendee	<i>2023</i>
Outstanding Reviewer, AISTATS	<i>2023</i>
FAccT Doctoral Consortium Selected Attendee	<i>2022</i>
Ontario Professional Engineers Foundation for Education Gold Medal, University of Toronto	<i>2019</i>
W.S. Wilson Medal, University of Toronto	<i>2019</i>
Dean's List, University of Toronto	<i>2014-2019</i>
Edward L. Donegan Scholarship (\$100K), University of Toronto	<i>2014-2019</i>
Ben Bernholtz Memorial Prize in Operations Research, University of Toronto	<i>2016</i>

### SERVICE

**In Cornell:**

- *Mentoring*: Graduate Student Mentor with Operations Research Graduate Association (2020-2023)
- *Operations Research Graduate Association*: Co-President (2021-2022), Visit Weekend Coordinator (2020 - 2021), Mentorship Director (2022 - 2023), URM PhD Application Support Program Officer (2023 - 2024)

#### In Conferences:

- *Session Chair*: INFORMS Annual Meeting, EURO Annual Meeting, IFORS Triennial Meeting
- *Referee*: AISTATS, FAccT, ICML, AAAI, NeurIPS

#### In Journals:

- *Referee*: Journal of Machine Learning Research, INFORMS Journal of Computing, Operations Research

INDUSTRY EXPERIENCE	<b>Microsoft Research</b> , Research Intern <span style="float: right;"><i>May - August 2023</i></span>	
	Project Title: “Preference Embedding from Chat: A Hybrid LLM and Constraint Programming Framework for Interactive Optimization”	
	<b>IBM Research</b> , Research Intern <span style="float: right;"><i>May - August 2021</i></span>	
	Project Title: “Interpretable Clustering via Multi-Polytope Machines”	
	<b>Cornell University</b> , COVID-19 Class Scheduling Team <span style="float: right;"><i>June - September 2020</i></span>	
	Led the implementation of the primary optimization models to schedule <b>all classes at Cornell during COVID-19</b> .	
	<b>Royal Bank of Canada</b> , A.I. Scientist <span style="float: right;"><i>September 2017 - June 2018</i></span>	
	Project Title: “ <b>Deep Reinforcement Learning for Trade Execution</b> ”	
	<b>BlackRock</b> , Summer Analyst <span style="float: right;"><i>June-August 2017, 2018</i></span>	
	<b>GetSmarter</b> , Data Science Intern <span style="float: right;"><i>June-August 2016</i></span>	
RELEVANT SKILLS	<b>Languages:</b>	English - Native French, German, Spanish - Beginner
	<b>Programming:</b>	Python, R, Java, SQL, MATLAB, C, Gurobi LaTeX, ReactJS, HTML, Windows/Unix Environment
	<b>Development:</b>	Git, SVN
PROFESSIONAL MEMBERSHIPS	Institute for Operations Research and the Management Sciences (INFORMS) Queer in AI Out in STEM	
REFERENCES	<b>Oktay Günlük</b> , Professor of Practice, Operations Research and Information Engineering, Cornell University, <a href="mailto:ong5@cornell.edu">ong5@cornell.edu</a>	
	<b>David Shmoys</b> , Laibe/Acheson Professor of Business Management & Leadership Studies, Operations Research and Information Engineering, Cornell University, <a href="mailto:david.shmoys@cornell.edu">david.shmoys@cornell.edu</a>	
	<b>Andrea Lodi</b> , Andrew H. and Ann R. Tisch Professor, Operations Research and Information Engineering, Cornell University, <a href="mailto:andrea.lodi@cornell.edu">andrea.lodi@cornell.edu</a>	