

Bo Tang

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RESEARCH INTERESTS

Decision-focused learning and differentiable optimization; learning to optimize mixed-integer problems; first-order methods and GPU-accelerated optimization.

ACADEMIC APPOINTMENT

Massachusetts Institute of Technology, Boston, MA

Postdoctoral Associate

Jan. 2026 – Present

Advisor: Haihao Lu

- Contributed to the development of [cuPDLPx](#), a GPU-accelerated first-order LP solver.
- Developing new first-order methods for linear programming.
- Developing MPI-based multi-GPU implementation of primal–dual linear programming.

EDUCATION BACKGROUND

University of Toronto, Toronto, Canada

Ph.D. in Operations Research

Advisor: Elias B. Khalil

GPA: 4.0/4.0

Sept. 2020 – Dec. 2025

Northeastern University, Boston, MA

M.Sc. in Operations Research

Advisor: Mehdi Behrooz

GPA: 4.0/4.0

Sept. 2017 – Dec. 2019

University of International Business and Economics, Beijing, China

B.Ec. in Actuarial Science

GPA: 3.54/4.0

Sept. 2013 - June 2017

PUBLICATIONS AND PREPRINTS

Peer-Reviewed Publications

Bo Tang, Elias Khalil†. "[PyEPO: A PyTorch-based End-to-End Predict-then-Optimize Library for Linear and Integer Programming](#)." *Mathematical Programming Computation*, 16, 297–335, 2024. [[Code](#), [Slides](#)]

Bo Tang, Elias Khalil†. "[CaVE: A Cone-Aligned Approach for Fast Predict-then-optimize with Binary Linear Programs](#)." *International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 193–210, 2024 [[Code](#), [Slides](#)]

Bo Tang, Elias Khalil†. "[Multi-Task Predict-then-Optimize](#)." *Learning and Intelligent Optimization Conference (LION)*, 506–522, 2023. [[Code](#)]

Ruobing Shen†, **Bo Tang**, Leo Liberti, Claudia D’Ambrosio, Stéphane Canu. "[Learning Discontinuous Piecewise Affine Fitting Functions Using Mixed Integer Programming over Lattice](#)" *Journal of Global Optimization*, 81, 85–

108, 2021.

[\[Code\]](#)

Ruobing Shen[†], **Bo Tang**, Andrea Lodi, Andrea Tramontani, Ismail Ben Ayed. "[An ILP Model for Multi-label MRFs with Connectivity Constraints](#)." *Transactions on Image Processing*, 29, 6909–6917, 2020. [\[Code\]](#)

Preprints and Manuscripts Under Review

Zhengzhong You, **Bo Tang**[†], Haoran Liu, Baichuan Mo. "[Learned Pairwise Deep Dual-Optimal Inequalities for Stabilizing Column Generation](#)" *INFORMS Journal on Computing*. Under Review

Bo Tang, Elias Khalil, Ján Drgoň[†]. "[Learning to Optimize for Mixed-Integer Non-linear Programming with Feasibility Guarantees](#)." *INFORMS Journal on Computing*. Major Revision [\[Code\]](#)

Workshop Papers:

Bo Tang^{*}, Yunfei Ma^{*†}, and Zhengzhong You. "Towards Routing Foundation Models for Commercial Vehicles." *UMFM 2026: Urban Mobility Foundation Models (ACM SIGSPATIAL 2026 Workshop)*.

Bo Tang, Elias Khalil[†]. "[PyEPO: A PyTorch-based End-to-End Predict-then-Optimize Library with Linear Objective Function](#)." *OPT 2022: Optimization for Machine Learning (NeurIPS 2022 Workshop)*.

Ruobing Shen[†], Thomas Guthier^{*}, **Bo Tang**^{*}, and Ismail Ben Ayed. "[Scribble supervised annotation algorithms of panoptic segmentation for autonomous driving](#)." *ML4AD 2019: Machine Learning for Autonomous Driving (NeurIPS 2019 Workshop)*.

WORKING PAPERS

Haihao Lu[†], **Bo Tang**, Jinwen Yang. "GPU First-Order Generalized PDHG Solver for Linear Programming with Reliable Infeasibility Detection." Targeted for *Mathematical Programming Computation*.

Bo Tang, Honghui Zheng, Jingyi Zhao, Ján Drgoň[†]. "NOIR: A MILP and MINLP Solver using Neural Overparameterization for Integer Representation." Targeted for *Forty-Fourth International Conference on Machine Learning*.

RESEARCH SOFTWARE

cuPDLPx: A GPU-Accelerated First-Order LP Solver

[\[GitHub Code\]](#)

- Implemented the core algorithm design and developed the Python interface.

REINS: A Learning-to-Optimize Framework for Parametric MINLP

[\[GitHub Code\]](#)

- Developed a learning-based framework for parametric mixed-integer nonlinear optimization.

PyEPO: PyTorch-based End-to-End Predict-then-Optimize Library

[\[GitHub Code\]](#)

- Developed a PyTorch library supporting multiple decision-focused learning methods.

Augmented Lagrangian Method for Block-Structured Integer Programming

[\[GitHub Code\]](#)

- Reproduced an augmented Lagrangian method for vehicle routing with time windows.

OCT: Optimal Classification Tree

[\[GitHub Code\]](#)

- Implemented three MILP formulations for optimal classification trees.

TUTORIALS & TALKS

Tutorials:

American Control Conference (ACC) – PIML Workshop: Open-source Code Tutorial	July 2024
AAAI Conference – LEANOPT Workshop: Open-source Code Tutorial	Dec. 2023
Cardinal Operations – CORIDM Lecture: Invited Lecture	Nov. 2023
Association for Constraint Programming Summer School: Tutorial Slides Preparation	July 2023

Talks:

INFORMS Annual Meeting: Oral Presentation (Scheduled)	Nov. 2026
INFORMS Annual Meeting: Panelist (Scheduled)	Nov. 2026
MIP Workshop: Poster Presentation	May 2026
INFORMS Annual Meeting: Oral Presentation	Oct. 2025
CORS Annual Conference: Three Oral Presentations	June 2025
MIP Workshop: Poster Presentation	June 2025
INFORMS Computing Society Conference: Oral Presentation	Mar. 2025
INFORMS Annual Meeting: Oral Presentation	Oct. 2024
CPAIOR Conference: Oral Presentation	May 2024
AAAI Conference – LEANOPT Workshop: Poster Presentation	Dec. 2023
INFORMS Annual Meeting: Oral Presentation	Oct. 2023
MIP Workshop: Poster Presentation	May 2023
Vector Research Symposium: Poster Presentation	May 2023
NeurIPS Conference – OPT Workshop: Poster Presentation	Dec. 2022

TEACHING EXPERIENCE

MIE365H1: Advanced Operations Research

Fall 2020, Fall 2023, Fall 2024

Tutorial Teaching Assistant and Lab Instructor

- Led tutorials and labs, providing instruction on the practical application of advanced algorithms and use of programming tools for solving complex optimization problems. [\[Colab Notes\]](#)

MIE376H1: Mathematical Programming

Winter 2024

Tutorial Teaching Assistant and Lab Instructor

- Designed and prepared assignments, exams, and lab sessions to guide students in theory and practice of mathematical modeling.

MIE424H1: Optimization in Machine Learning

Winter 2024

Tutorial Teaching Assistant

- Led tutorials focused on deepening students' understanding of machine learning by exploring its foundations through the lens of optimization techniques. [\[Colab Notes\]](#)

INDUSTRY EXPERIENCE

Pacific Northwest National Laboratory, Richland, United States

Data Science Intern, Advanced Computing, Mathematics, and Data Division

June 2023 - Sept. 2023

- Contributed to the development of [NeuroMANCER](#), an open-source differentiable programming library.
- Investigated learning-based correction methods for mixed-integer nonlinear optimization.

Hyundai Mobis, Frankfurt Am Main Area, Germany

Machine Learning Intern, Vision Recognition Algorithm Team

Feb. 2019 - Aug. 2019

- Developed image annotation algorithms for segmentation datasets.
- Built a graphical annotation tool to streamline labeling workflows.

Willis Towers Watson, Beijing, China

Actuarial Intern, Investment Risk and Reinsurance

Dec. 2016 - May 2017

- Supported actuarial modeling and conducted sensitivity analyses across risk scenarios.

BLOG ENTRIES

When Machine Learning Meets Operations Research: PyEPO Framework and End-to-End Predict-Then-Optimize Algorithms [\[Chinese Version\]](#)

Paper Interpretation and Reproduction: Augmented Lagrangian Method for Block-Structured Integer Programming [\[English Version\]](#) | [\[Chinese Version\]](#)

A Deep Dive into DeepOPF: A Deep Neural Network Approach for Security-Constrained DC Optimal Power Flow Problems [\[Chinese Version\]](#)

Decision Trees and Mathematical Programming: Three Mixed-Integer Linear Programming Models for Optimal Classification Trees and Their Implementation [\[Chinese Version\]](#)

ACADEMIC SERVICE

Reviewer: Journal of Heuristics; IISE Transactions; ICLR 2025–2026; ICML 2024–2025; NeurIPS 2023, 2025

Session Chair: Optimization and Robust Linear Models, INFORMS Annual Meeting, 2024

Program Committee Member: NeurIPS Workshop on GPU-Accelerated and Scalable Optimization, 2025.

Media Editor: Operation Research China Society (运筹 OR 帷幄), OlittleRer (运小筹)