

Sally Dong

Website
Google Scholar

CONTACT	sallyqd@mit.edu	CITIZENSHIP: Canadian
APPOINTMENTS	Massachusetts Institute of Technology Postdoctoral researcher	Sept 2024-present
EDUCATION	University of Washington, Seattle Ph.D., Computer Science and Engineering Advisors: Yin Tat Lee, Thomas Rothvoss Dissertation: Convex optimization with combinatorial characteristics: new algorithms for linear programming, min-cost flow, and other structured problems.	June 2024
	University of Waterloo B.Math. <i>with distinction – Dean’s Honours List (highest honours)</i> Majors: computer science, combinatorics & optimization, pure math	June 2018
PREPRINTS	Playing devil’s advocate: argument-driven red-teaming of LLMs. Sally Dong, Mohammed Taha Zakir, Beibei Li, Ramayya Krishnan. In submission to NeurIPS. A Contextual Measure of Ambiguity in Prescriptive Texts. Sally Dong, Luke Thorburn, Andrew Konya, Michiel Bakker. In submission to EMNLP. Extended abstract at <i>Workshop on NLP for Democracy, Conference on Language Modeling</i> , 2025. Strategic Polarization: Political Advertising Rhetoric Across Geographic and Institutional Contexts. Sally Dong. Extended abstract at <i>Western Political Science Association Annual Meeting</i> , 2025.	
INDUSTRY	Arini.ai , Remote	Mar 2026 – Jun 2026
EXPERIENCE	Consulting Optimization Engineer (part-time) • Prototyped an AI-native analytics platform for appointment scheduling and SKU management for dental practices Amazon , Luxembourg Applied Scientist Intern, Algorithms and Optimization Lab • Designed and implemented truck-scheduling algorithms for Amazon’s middle-mile transportation network • Launched in production across European and North American networks, with operating-cost savings of approx. €1M per week in Europe The Voleon Group , Berkeley, CA Quantitative Research Intern • Designed and trained an MLP-based model using JAX to approximate the optimal portfolio allocation problem over a large-scale equities dataset, subject to allocation constraints. Amazon , Seattle, WA Software Engineering Intern	Oct 2022 – Mar 2023 Jun – Sept 2022 Sept – Dec 2017
	Microsoft (Intentional Software) , Bellevue, WA Software Engineering and Programming Languages Intern	Sept – Dec 2015
PUBLICATIONS	Nested Dissection Meets IPMs: Planar Min-Cost Flow in Nearly-Linear Time. with Yu Gao, Gramoz Goranci, Yin Tat Lee, Richard Peng, Sushant Sachdeva, and Guanghao Ye. <i>Journal of the ACM</i> , 2025.	

ACM-SIAM Symposium on Discrete Algorithms (SODA), 2022.
<https://arxiv.org/abs/2205.01562>.

Faster Min-Cost Flow and Approximate Tree Decomposition on Bounded Treewidth Graphs.

with Guanghai Ye.

European Symposium on Algorithms (ESA), 2024.
<https://arxiv.org/abs/2308.14727>.

The Extension Complexity of Polytopes with Bounded Integral Slack Matrices.

with Thomas Rothvoss.

Conference on Integer Programming and Combinatorial Optimization (IPCO), 2024.
<https://arxiv.org/abs/2307.16159>.

Fast Algorithms for Separable Linear Programs.

with Gramoz Goranci, Lawrence Li, Sushant Sachdeva, and Guanghai Ye.

ACM-SIAM Symposium on Discrete Algorithms (SODA), 2024.
<https://arxiv.org/abs/2310.16351>.

Decomposable Non-Smooth Convex Optimization with Nearly-Linear Gradient Oracle Complexity.

with Haotian Jiang, Yin Tat Lee, Swati Padmanabhan and Guanghai Ye.

Neural Information Processing Systems (NeurIPS), 2022.
<https://arxiv.org/abs/2208.03811>.

A Nearly-Linear Time Algorithm for Linear Programs with Small Treewidth: A Multiscale Representation of Robust Central Path.

with Yin Tat Lee and Guanghai Ye.

ACM Symposium on Theory of Computing (STOC), 2021. Invited to SICOMP Special Issue.
<https://arxiv.org/abs/2011.05365>.

Computing Circle Packing Representations of Planar Graphs.

with Yin Tat Lee and Kent Quanrud.

ACM-SIAM Symposium on Discrete Algorithms (SODA), 2020.
<https://arxiv.org/abs/1911.00612>.

Improved Bounds for Rota's Basis Conjecture.

with Jim Geelen.

Combinatorica, 2019.

<https://arxiv.org/abs/1709.00075>. Polymath 12 discussions.

Modeling Temporal Effects in Re-captured Video.

Philipp Schaber, Sally Dong, Benjamin Guthier, Stefan Kopf, Wolfgang Effelsberg.
ACM International Conference on Multimedia (ACMMM), 2015.

SELECT AWARDS	NSERC (Canadian NSF equivalent) Postgraduate Scholarship	2021
	NSERC Alexander Graham Bell Canada Graduate Scholarship (declined)	2021
	EECS Great Educators Fellowship, MIT (declined)	2018
	Jessie W.H. Zou Memorial Award, University of Waterloo	2018
	NSERC Undergraduate Research Award	2016, 2017
	University of Waterloo President's Research Award	2016
	University of Waterloo President's International Experience Award	2015
	President's Scholarship of Distinction, University of Waterloo	2013
	Suncor Energy Inc. Emerging Leaders Award, University of Waterloo	2013
TEACHING ASSISTANT	Introduction to Computing, University of Washington	Apr – Jun 2023
	Algorithms, University of Washington	Jan – Mar 2022, Apr – Jun 2020
	Sketching Algorithms, University of Washington	Jan – Mar 2021
	Calculus 2, University of Waterloo	Jan – Apr 2017
	Introduction to Combinatorics, University of Waterloo	May – Aug 2015

INVITED TALKS

“Fast algorithm design for structured linear programs.”*SIAM Conference on Optimization*, University of Edinburgh. Jun 2026.*Mixed Integer Programming Society Annual Workshop*, University of Connecticut. May 2026.*Computer Science Seminar*, Brown University. Apr 2025.*Discrete Optimization Session*, INFORMS Annual Meeting. Oct 2024.*Seminar*, Amazon modeling and optimization group. Apr 2024.*Computer Science Seminar*, UMass Amherst. Feb 2024.*West Coast Optimization Meeting*. Simon Fraser University, Sep 2023.**“The Extension Complexity of Polytopes with Bounded Integral Slack Matrices.”***Workshop on Integer Programming*, McGill University. Jun 2025.*IPCO conference presentation*, Jul 2024.**“Faster Min-Cost Flow and Approximate Tree Decomposition on Bounded Treewidth Graphs.”***ESA conference presentation*, Sep 2024.**“Fast algorithms for structured linear programs.”***SODA conference presentation*, Jan 2024.*Optimization and Algorithms Design Workshop*. Simons Institute, Berkeley, Dec 2023.**“Nested Dissection Meets IPMs: Planar Min-Cost Flow in Nearly-Linear Time.”***Theory Seminar*. University of Washington, May 2022.*Theory Seminar*. University of Toronto, May 2022.*SODA conference presentation*, Jan 2022.*Workshop on Continuous Approaches to Discrete Optimization*. Hausdorff Institute for Mathematics, University of Bonn, Oct 2021.**“A Nearly-Linear Time Algorithm for Linear Programs with Small Treewidth.”***Workshop on Parametrized Complexity*. Hausdorff Institute for Mathematics, University of Bonn, Dec 2021.**“Computing Circle Packing Representations of Planar Graphs.”***Theory Seminar*. University of Washington, Apr 2020.*Theory Tea*. EPFL, Switzerland, Feb 2020.*SODA conference presentation*, Jan 2020.**“Improved Bounds for Rota’s Basis Conjecture.”***Theory Lunch*. University of Washington, Feb 2019.*Graphs and Matroids Seminar*. University of Waterloo, Apr 2018.

SERVICE

Annual reviewer for the conferences NeurIPS, STOC, FOCS, SODA, ESA, ICALP, ITCS.

Reviewer for *IEEE Transaction on Visualization and Computer Graphics*, *Journal of Privacy and Confidentiality*, *Annals of Combinatorics*, *Graphs and Combinatorics*, *Advances in Applied Mathematics*.

UW computer science department PhD applications reader.

SKILLS

Python, PyTorch, JAX, NumPy/SciPy, C, C++, Haskell, HPC/Slurm, Git, Linux, L^AT_EX