Sally Dong

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CONTACT sallyqd@cs.washington.edu CITIZENSHIP: Canadian

EDUCATION

University of Washington, Seattle June 2024
Ph.D., Computer Science and Engineering

Advisor: Yin Tat Lee
Dissertation: Convex optimization with combinatorial characteristics: new algorithms for linear programming, min-cost flow, and other structured problems.

University of Waterloo June 2018
B.Math. *with distinction – Dean's Honours List (highest honours)*
Majors: computer science, combinatorics & optimization, pure math

PUBLICATIONS AND PREPRINTS

Authors are listed in alphabetical order, as is convention in pure math and theoretical computer science.

Faster Min-Cost Flow and Approximate Tree Decomposition on Bounded Treewidth Graphs.
with Guanghao 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 Guanghao Ye.
Proceedings of the 35th 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 Guanghao Ye.
NeurIPS, 2022.
https://arxiv.org/abs/2208.03811.

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.
Proceedings of the 33rd ACM-SIAM Symposium on Discrete Algorithms (SODA), 2022.
https://arxiv.org/abs/2205.01562.

A Nearly-Linear Time Algorithm for Linear Programs with Small Treewidth: A Multiscale Representation of Robust Central Path.
with Yin Tat Lee and Guanghao Ye.
Proceedings of the 53rd 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.
Proceedings of the 31st 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.
P. Schaber, S. Dong, B. Guthier, S. Kopf, W. Effelsberg.
Proceedings of the 23rd ACM International Conference on Multimedia (ACMMM), 2015.

Industry Experience

Amazon Transportation Services, Luxembourg — Oct 2022 – Mar 2023
Applied Scientist Intern, Algorithms and Optimization Lab
Designed and implemented truck-scheduling algorithms for Amazon's middle-mile transportation network. My work was launched in production for the European and North American network, and led to savings in operating costs of approximately one million Euros per week in Europe.

The Voleon Group, Berkeley, CA — Jun – Sept 2022
Quantitative Research Intern
Built a deep-learning model using Jax to solve the optimal portfolio allocation problem.

Amazon, Seattle, WA — Sept – Dec 2017
Software Engineering Intern

Intentional Software, Bellevue, WA — Sept – Dec 2015
Software Engineering and Programming Languages Intern

Teaching Assistantships

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
Algebra, University of Waterloo	Sept – Dec 2014

Awards

NSERC (Canadian NSF equivalent) Postgraduate Scholarship — 2021
NSERC Alexander Graham Bell Canada Graduate Scholarship (declined) — 2021
Financial support for PhD studies in STEM awarded to top candidates across Canada, valued at $105,000 CAD over 3 years.

EECS Great Educators Fellowship, MIT (declined) — 2018
Jessie W.H. Zou Memorial Award, University of Waterloo — 2018
Awarded to one student annually in the Faculty of Math for excellence in undergraduate research (with advisor nomination).

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
Top entrance scholarship in engineering awarded to four students a year.

Invited Talks

"Faster Min-Cost Flow and Approximate Tree Decomposition on Bounded Treewidth Graphs."
ESA conference presentation, Sep 2024.

"The Extension Complexity of Polytopes with Bounded Integral Slack Matrices."
IPCO conference presentation, Jul 2024.

"Fast algorithms for structured linear programs."
Discrete Optimization Session, INFORMS Annual Meeting. Oct 2024.
Seminar, Amazon modeling and optimization group. Apr 2024.
Computer Science Seminar, UMass Amherst. Feb 2024.
SODA conference presentation, Jan 2024.
Optimization and Algorithms Design Workshop. Simons Institute, Berkeley, Dec 2023.
West Coast Optimization Meeting. Simon Fraser University, Sep 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

External reviewer for the conferences STOC, FOCS, SODA, ESA, ICALP, ITCS.
Reviewer for *IEEE Transaction on Visualization and Computer Graphcis, Journal of Privacy and Confidentiality, Annals of Combinatorics, Graphs and Combinatorics, Advances in Applied Mathematics.*
UW computer science department PhD applications reader.
Waterloo CUMC Committee Co-Chair
Secured funding, oversaw the application process, and organized the trip for 30 undergraduate students to attend the Canadian Undergraduate Math Conference.

Misc Experience

AAAS Catelyzing Advocacy in Science and Engineering Workshop Apr 2024
One of four attendees sponsored by UW to attend an annual workshop on science policy in D.C. organized by the American Association for the Advancement of Science

Languages

Python, PyTorch, C, C++, Java, C#, Haskell, Matlab