D Ellis Hershkowitz

Assistant Professor, Brown University Computer Science Department

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Employment

Brown University — *Providence, RI*

Assistant Professor in Computer Science Department — *Fall 2023 -*

- Research interests: approximation algorithms; online algorithms; metric embeddings; distributed graph algorithms.

ETH Zürich — *Zürich, Switzerland*

Postdoc in Math Department — *Fall 2022 - Summer 2023*

- Hosted by Professor Rico Zenklusen in the Mathematical Optimization Group.

Visiting Researcher in Computer Science Department — *Summer, Fall 2021*

- Visted Professor Mohsen Ghaffari's group in the Institute of Theoretical Computer Science.

Education

Carnegie Mellon University — *Pittsburgh, PA*

PhD in Computer Science — *Fall 2016 - Spring 2022*

- Advised by Professors Bernhard Haeupler and R. Ravi.
- Thesis: Compact Representations of Graphs and Their Metrics.
- Thesis Committee: Bernhard Haeupler, R. Ravi, Anupam Gupta (CMU); Michel Goemans (MIT); Ola Svensson (EPFL).

Brown University — *Providence, RI*

MS in Computer Science — *Fall 2015 - Spring 2016*

- Advised by Professor Michael L. Littman.

BA in Computer Science and Philosophy — *Fall 2012 - Spring 2015*

- Advised by Professor Stefanie Tellex.

Publications

Parallel Hierarchical Agglomerative Clustering in Low Dimensions — *Preprint*

With Mohammad Hossein Bateni, Laxman Dhulipala, Willem Fletcher, Kishen Gowda, Rajesh Jayaram, Jakub Lacki

Parallel Greedy Spanners — *Preprint*

With Bernhard Haeupler, Zihan Tan

Low Recourse Arborescence Forests Under Uniformly Random Arcs — *WAOA 2025*

With Niklas Dahlmeier

(Workshop on Approximation and Online Algorithms)

Simple Length-Constrained Minimum Spanning Trees — *SOSA 2025*

With Richard Huang

(SIAM Symposium on Simplicity in Algorithms)

Efficient Centroid-Linkage Clustering — *NeurIPS 2024*

With Mohammad Hossein Bateni, Laxman Dhulipala, Willem Fletcher, Kishen Gowda, Rajesh Jayaram, Jakub Lacki

(Conference on Neural Information Processing Systems)

New Structures and Algorithms for Length-Constrained Expander Decompositions — *FOCS 2024*

With Bernhard Haeupler, Zihan Tan

(IEEE Symposium on Foundations of Computer Science)

It's Hard to HAC with Average Linkage! *ICALP 2024*

With Mohammad Hossein Bateni, Laxman Dhulipala, Kishen Gowda, Rajesh Jayaram, Jakub Lacki

(International Colloquium on Automata, Languages and Programming 2024)

Ghost Value Augmentation for k-Edge-Connectivity *STOC 2024*

With Nathan Klein, Rico Zenklusen

(ACM Symposium on Theory of Computing 2024)

Invited to SICOMP Special Issue

Low-Step Multi-Commodity Flow Emulators *STOC 2024*

With Bernhard Haeupler, Jason Li, Antti Röyskö, Thatchaphol Saranurak

(ACM Symposium on Theory of Computing 2024)

One Tree to Rule Them All: Poly-Logarithmic Universal Steiner Tree *FOCS 2023*

With Costas Busch, Da Qi Chen, Arnold Filtser, Daniel Hathcock, Rajmohan Rajaraman

(IEEE Symposium on Foundations of Computer Science)

Max. Length-Constrained Flows and Disjoint Paths: Distributed, Deterministic and Fast *STOC 2023*

With Bernhard Haeupler, Thatchaphol Saranurak

(ACM Symposium on Theory of Computing 2023)

$O(1)$ Steiner Point Removal in Series-Parallel Graphs *ESA 2022*

With Jason Li

(European Symposium on Algorithms 2022)

Deterministic Tree Embeddings with Copies for Algorithms Against Adaptive Adversaries *ESA 2022*

With Bernhard Haeupler, Goran Zuzic

(European Symposium on Algorithms 2022)

Near-Optimal Schedules for Simultaneous Multicasts *ICALP 2021*

With Bernhard Haeupler, David Wajc

(International Colloquium on Automata, Languages and Programming 2021)

Tree Embeddings for Hop-Constrained Network Design *STOC 2021*

With Bernhard Haeupler, Goran Zuzic

(ACM Symposium on Theory of Computing 2021)

District-Fair Participatory Budgeting *AAAI 2021*

With Anson Kahng, Dominik Peters, Ariel D. Procaccia

(AAAI Conference on Artificial Intelligence 2021)

An Optimal Rounding for Half-Integral Weighted MSCSS *IPL 2020*

With Gregory Kehne, R. Ravi

(Information Processing Letters 2020)

Reverse Greedy is Bad for k-Center *IPL 2020*

With Gregory Kehne

(Information Processing Letters 2020)

Computation-Aware Data Aggregation *ITCS 2020*

With Bernhard Haeupler, Anson Kahng, Ariel Procaccia

(Innovations in Theoretical Computer Science 2020)

Erasure Correction for Noisy Radio Networks *DISC 2019*

With Keren Censor-Hillel, Bernhard Haeupler, Goran Zuzic

(International Symposium on Distributed Computing 2019)

Prepare for the Expected Worst: Algorithms for Reconfigurable Resources Under Uncert. *APPROX 2019*

With R. Ravi, Sahil Singla

(International Workshop on Approximation Algorithms for Combinatorial Optimization Problems)

Finding Options that Minimize Planning Time *ICML 2019*

With Yuu Jinnai, David Abel, Michael Littman, George Konidaris

(International Conference on Machine Learning 2019)

Round- and Message-Optimal Distributed Graph Algorithms *PODC 2018*

With Bernhard Haeupler, David Wajc

(Symposium on Principles of Distributed Computing 2018)

Broadcasting in Noisy Radio Networks *PODC 2017*

With Keren Censor-Hillel, Bernhard Haeupler, Goran Zuzic

(Symposium on Principles of Distributed Computing 2017)

Near Optimal Behavior via Approximate State Abstraction *ICML 2016*

With David Abel, Michael Littman

(International Conference on Machine Learning 2016)

Goal-based Action Priors *ICAPS 2015*

With David Abel, Gabriel Barth-Maron, Stephen Brawner, Kevin O'Farrell, James MacGlashan, Stefanie Tellex

(International Conference on Automated Planning and Scheduling 2015)

Invited Talks (Since 2024)

An Advertisement for Length-Constrained Expander Decompositions

7/21/2024 **ISMP**, Workshop on Network Design *Montreal, QC*

New Structures and Algorithms for Length-Constrained Expander Decompositions

6/26/2024 **STOC 2024**, Workshop on Length-Constrained Expanders *Vancouver, BC*

Polylogarithmic Universal Steiner Trees and Strong Sparse Partition Hierarchies

4/29/2024 **Cornell**, Theory Seminar *Ithaca, NY*

3/12/2024 **Google Research NYC**, Algorithms Seminar *New York, NY*

3/7/2024 **University of Maryland**, Algorithms Seminar *College Park, MA*

2/28/2024 **MIT**, Algorithms and Complexity Seminar *Boston, MA*

1/23/2024 **University of Bonn**, Algorithms Seminar @ Research Institute for Discrete Mathematics *Bonn, Germany*

1/22/2024 **ETH Zürich, Institute for Operations Research**, Algorithms Seminar *Zürich, Switzerland*

1/12/2024 **Aussois**, Workshop on Combinatorial Optimization *Aussois, France*

Classes Taught

Fall 2025 **Discrete Structures and Probability (CSCI 0220)**, Instructor *Brown*

Spring 2025 **Discrete Structures and Probability (CSCI 0220)**, Co-Instructor w/ Robert Lewis *Brown*

Fall 2024 **An Algorithmist's Toolkit (CSCI 2952T)**, Instructor *Brown*

Fall 2023 **Frontiers of Graph Algorithms (CSCI 1952C)**, Instructor *Brown*

Fall 2022 **Advanced Topics in Discrete Optimization (401-3900-00)**, Co-Instructor w/ Richard Santiago *ETH Zürich*

Other Teaching Experience

Spring 2019 **Algorithmic Superpower Randomization (15-859)**, 3 Hour Lecture on Lovász Local Lemma *Carnegie Mellon*

Fall 2017 **Graduate Complexity Theory (15-855)**, Graduate Teaching Assistant *Carnegie Mellon*

Spring 2017 **Undergraduate Complexity Theory (15-455)**, Graduate Teaching Assistant *Carnegie Mellon*

Spring 2016 **Introduction for Non-Majors (CS8)**, Teaching Assistant *Brown*

Fall 2014 **Artificial Intelligence (CS141)**, Teaching Assistant *Brown*

Spring 2014 **An Integrated Introduction to Computer Science (CS18)**, Teaching Assistant *Brown*

Fall 2013 **An Integrated Introduction to Computer Science (CS17)**, Teaching Assistant *Brown*

Theses Advised

Minimum Recourse Branching Algorithms *ETH Zürich 2023*

Niklas Dahlmeier's Master's Thesis

New Proof of Lower Bound for the Steiner Point Removal Problem *ETH Zürich 2022*

Jonathan Schnell's Bachelor's Thesis

Compact Name-independent Congestion-Competitive Oblivious Routing *ETH Zürich 2021*

Yiting Wang's Master's Thesis

Funding

A Scalable Graph-Based Approach to Clustering *NSF 2024-2028*

CCF-2403236, Collaborative Medium, SHF, $363,931

Recent Professional Service

Ongoing	**Brown CS Theory Seminar Organizer**, Fall 2023 (co-organizer), Spring 2024.	*Brown*
Ongoing	**Brown Algorithms Lunch Organizer**, Summer 2024, Fall 2024.	*Brown*
Ongoing	**Program Committees**, APPROX 2025. ESA 2025. SOSA 2025. AAAI 2021.	
Ongoing	**Reviewer**, SODA 2026; FOCS 2025; ICALP 2025; IPCO 2025; STOC 2025; ESA 2024; ICALP 2024; SODA 2024; ESA 2023; FOCS 2023; ICALP 2023; SODA 2023; RANDOM 2022; ESA 2022; ICALP 2022; FOCS 2021; DIST 2020; ICALP 2020; ITCS 2020; DIST 2019; DISC 2019; ESA 2019; FOCS 2019; STOC 2019; SODA 2019; DISC 2018; STACS 2018.	