

# D Ellis Hershkowitz

ASSISTANT PROFESSOR, BROWN UNIVERSITY COMPUTER SCIENCE DEPARTMENT

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## Employment

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### 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

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### 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

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### Parallel Greedy Spanners

Preprint

WITH BERNHARD HAEUPLER, ZIHAN TAN

### 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)

<b>Ghost Value Augmentation for <math>k</math>-Edge-Connectivity</b>	<i>STOC 2024</i>
WITH NATHAN KLEIN, RICO ZENKLUSEN (ACM Symposium on Theory of Computing 2024) <b>Invited to SICOMP Special Issue</b>	
<b>Low-Step Multi-Commodity Flow Emulators</b>	<i>STOC 2024</i>
WITH BERNHARD HAEUPLER, JASON LI, ANTTI RÖYSKÖ, THATCHAPHOL SARANURAK (ACM Symposium on Theory of Computing 2024)	
<b>One Tree to Rule Them All: Poly-Logarithmic Universal Steiner Tree</b>	<i>FOCS 2023</i>
WITH COSTAS BUSCH, DA QI CHEN, ARNOLD FILTNER, DANIEL HATHCOCK, RAJMOHAN RAJARAMAN (IEEE Symposium on Foundations of Computer Science)	
<b>Max. Length-Constrained Flows and Disjoint Paths: Distributed, Deterministic and Fast</b>	<i>STOC 2023</i>
WITH BERNHARD HAEUPLER, THATCHAPHOL SARANURAK (ACM Symposium on Theory of Computing 2023)	
<b><math>O(1)</math> Steiner Point Removal in Series-Parallel Graphs</b>	<i>ESA 2022</i>
WITH JASON LI (European Symposium on Algorithms 2022)	
<b>Deterministic Tree Embeddings with Copies for Algorithms Against Adaptive Adversaries</b>	<i>ESA 2022</i>
WITH BERNHARD HAEUPLER, GORAN ZUZIC (European Symposium on Algorithms 2022)	
<b>Near-Optimal Schedules for Simultaneous Multicasts</b>	<i>ICALP 2021</i>
WITH BERNHARD HAEUPLER, DAVID WAJC (International Colloquium on Automata, Languages and Programming 2021)	
<b>Tree Embeddings for Hop-Constrained Network Design</b>	<i>STOC 2021</i>
WITH BERNHARD HAEUPLER, GORAN ZUZIC (ACM Symposium on Theory of Computing 2021)	
<b>District-Fair Participatory Budgeting</b>	<i>AAAI 2021</i>
WITH ANSON KAHNG, DOMINIK PETERS, ARIEL D. PROCACCIA (AAAI Conference on Artificial Intelligence 2021)	
<b>An Optimal Rounding for Half-Integral Weighted MSCSS</b>	<i>IPL 2020</i>
WITH GREGORY KEHNE, R. RAVI (Information Processing Letters 2020)	
<b>Reverse Greedy is Bad for <math>k</math>-Center</b>	<i>IPL 2020</i>
WITH GREGORY KEHNE (Information Processing Letters 2020)	
<b>Computation-Aware Data Aggregation</b>	<i>ITCS 2020</i>
WITH BERNHARD HAEUPLER, ANSON KAHNG, ARIEL PROCACCIA (Innovations in Theoretical Computer Science 2020)	
<b>Erasur Correction for Noisy Radio Networks</b>	<i>DISC 2019</i>
WITH KEREN CENSOR-HILLEL, BERNHARD HAEUPLER, GORAN ZUZIC (International Symposium on Distributed Computing 2019)	
<b>Prepare for the Expected Worst: Algorithms for Reconfigurable Resources Under Uncert.</b>	<i>APPROX 2019</i>
WITH R. RAVI, SAHIL SINGLA (International Workshop on Approximation Algorithms for Combinatorial Optimization Problems)	
<b>Finding Options that Minimize Planning Time</b>	<i>ICML 2019</i>
WITH YUU JINNAI, DAVID ABEL, MICHAEL LITTMAN, GEORGE KONIDARIS (International Conference on Machine Learning 2019)	

<b>Round- and Message-Optimal Distributed Graph Algorithms</b>	<i>PODC 2018</i>
WITH BERNHARD HAEUPLER, DAVID WAJC (Symposium on Principles of Distributed Computing 2018)	
<b>Broadcasting in Noisy Radio Networks</b>	<i>PODC 2017</i>
WITH KEREN CENSOR-HILLEL, BERNHARD HAEUPLER, GORAN ZUZIC (Symposium on Principles of Distributed Computing 2017)	
<b>Near Optimal Behavior via Approximate State Abstraction</b>	<i>ICML 2016</i>
WITH DAVID ABEL, MICHAEL LITTMAN (International Conference on Machine Learning 2016)	
<b>Goal-based Action Priors</b>	<i>ICAPS 2015</i>
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)

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<b>An Advertisement for Length-Constrained Expander Decompositions</b>		
7/21/2024	ISMP, Workshop on Network Design	<i>Montreal, QC</i>
<b>New Structures and Algorithms for Length-Constrained Expander Decompositions</b>		
6/26/2024	STOC 2024, Workshop on Length-Constrained Expanders	<i>Vancouver, BC</i>
<b>Polylogarithmic Universal Steiner Trees and Strong Sparse Partition Hierarchies</b>		
4/29/2024	Cornell, Theory Seminar	<i>Ithaca, NY</i>
3/12/2024	Google Research NYC, Algorithms Seminar	<i>New York, NY</i>
3/7/2024	University of Maryland, Algorithms Seminar	<i>College Park, MA</i>
2/28/2024	MIT, Algorithms and Complexity Seminar	<i>Boston, MA</i>
1/23/2024	University of Bonn, Algorithms Seminar @ Research Institute for Discrete Mathematics	<i>Bonn, Germany</i>
1/22/2024	ETH Zürich, Institute for Operations Research, Algorithms Seminar	<i>Zürich, Switzerland</i>
1/12/2024	Aussois, Workshop on Combinatorial Optimization	<i>Aussois, France</i>

## Classes Taught

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Fall 2024	Discrete Structures and Probability (CSCI 0220), Co-Instructor w/ Robert Lewis	<i>Brown</i>
Fall 2024	An Algorithmist's Toolkit (CSCI 2952T), Instructor	<i>Brown</i>
Fall 2023	Frontiers of Graph Algorithms (CSCI 1952C), Instructor	<i>Brown</i>
Fall 2022	Advanced Topics in Discrete Optimization (401-3900-00), Co-Instructor w/ Richard Santiago	<i>ETH Zürich</i>

## Other Teaching Experience

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Spring 2019	Algorithmic Superpower Randomization (15-859), 3 Hour Lecture on Lovász Local Lemma	<i>Carnegie Mellon</i>
Fall 2017	Graduate Complexity Theory (15-855), Graduate Teaching Assistant	<i>Carnegie Mellon</i>
Spring 2017	Undergraduate Complexity Theory (15-455), Graduate Teaching Assistant	<i>Carnegie Mellon</i>
Spring 2016	Introduction for Non-Majors (CS8), Teaching Assistant	<i>Brown</i>
Fall 2014	Artificial Intelligence (CS141), Teaching Assistant	<i>Brown</i>
Spring 2014	An Integrated Introduction to Computer Science (CS18), Teaching Assistant	<i>Brown</i>
Fall 2013	An Integrated Introduction to Computer Science (CS17), Teaching Assistant	<i>Brown</i>

## Theses Advised

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<b>Minimum Recourse Branching Algorithms</b>	<i>ETH Zürich 2023</i>
NIKLAS DAHLMEIER'S MASTER'S THESIS	

## New Proof of Lower Bound for the Steiner Point Removal Problem

JONATHAN SCHNELL'S BACHELOR'S THESIS

ETH Zürich 2022

## Compact Name-independent Congestion-Competitive Oblivious Routing

YITING WANG'S MASTER'S THESIS

ETH Zürich 2021

## Funding

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### A Scalable Graph-Based Approach to Clustering

CCF-2403236, COLLABORATIVE MEDIUM, SHF, \$363,931

NSF 2024-2028

## Recent Professional Service

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Ongoing	<b>Brown CS Theory Seminar Organizer</b> , Fall 2023 (co-organizer), Spring 2024.	<i>Brown</i>
Ongoing	<b>Brown Algorithms Lunch Organizer</b> , Summer 2024, Fall 2024.	<i>Brown</i>
Ongoing	<b>Program Committees</b> , APPROX 2025. ESA 2025. SOSA 2025. AAAI 2021. <b>Reviewer</b> , 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.	
Ongoing		