Hadley Black

Postdoctoral Researcher in Computer Science
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Education

2023   PhD in Computer Science, *UCLA*
Adviser: Raghu Meka

- *Thesis:* Testing and Learning in High-Dimensions: Monotonicity Testing, Directed Isoperimetry, and Convex Sets

2018   MS in Computer Science, *UC Santa Cruz*
Adviser: C. Seshadhri.

2016   BA in Computer Science, *UC Santa Cruz*
2016   BA in Pure Mathematics, *UC Santa Cruz*

- Graduated with highest honors in both majors
- *GPA:* 3.91 - *Magna Cum Laude*

Publications

2025   Hadley Black, Arya Mazumdar, Barna Saha, Yinzhan Xu
Optimal Graph Reconstruction by Counting Connected Components in Induced Subgraphs.
Preprint.

2024   Hadley Black, Arya Mazumdar, Barna Saha
Learning Partitions with Optimal Query and Round Complexities.
Preprint.

2024   Hadley Black, Euiwoong Lee, Arya Mazumdar, Barna Saha
Clustering with Non-adaptive Subset Queries.
In *Neural Information Processing Systems* (**NeurIPS**), 2024.

2023   Hadley Black.
Nearly Optimal Bounds for Sample-Based Testing and Learning of k-Monotone Functions.
In *International Conference on Randomization and Computation* (**RANDOM**), 2024.

2023   Hadley Black, Eric Blais, Nathaniel Harms.
Testing and Learning Convex Sets in the Ternary Hypercube.
In *Innovations in Theoretical Computer Science* (**ITCS**), 2024.

2023   Hadley Black, Deeparnab Chakrabarty, C. Seshadhri.
A $d^{1/2+o(1)}$ Monotonicity Tester for Boolean Functions on d-Dimensional Hypergrids.
In *Foundations of Computer Science* (**FOCS**), 2023. Invited to **SICOMP** Special Issue.

2022   Hadley Black, Deeparnab Chakrabarty, C. Seshadhri.
Directed Isoperimetric Theorems for Boolean Functions on the Hypergrid and an $\widetilde{O}(n\sqrt{d})$ Monotonicity Tester.
In *Symposium on Theory of Computing* (**STOC**), 2023.

2020   Hadley Black, Iden Kalemaj, Sofya Raskhodnikova.
Isoperimetric Inequalities for Real-Valued Functions with Applications to Monotonicity Testing.
In *Random Structures and Algorithms* (**RSA**), 2024.
In *International Colloquium on Automata, Languages, and Programming* (**ICALP**), 2023.

2019   Hadley Black, Deeparnab Chakrabarty, C. Seshadhri.
Domain Reduction for Monotonicity Testing: A $o(d)$ Tester for Boolean Functions in d-Dimensions.
In *Symposium on Discrete Algorithms* (**SODA**), 2020.

2018   Hadley Black, Deeparnab Chakrabarty, C. Seshadhri.
A $o(d)$·polylog n Monotonicity Tester for Boolean Functions over the Hypergrid $[n]^d$.
In *Symposium on Discrete Algorithms* (**SODA**), 2018.

Honors and Awards

2023   Student Travel Award, FOCS 2023.
2023   Student Travel Award, STOC 2023.
2020   *SIAM* Student Travel Award, SODA 2020.
2019-2020   Computer Science Department Fellowship Recipient, UCLA.
2018-2019   Samueli Fellowship Recipient, UCLA.
2018   *SIAM* Student Travel Award, SODA 2018.
Spring 2017   Regent's Fellowship Recipient, UC Santa Cruz.
2016   Porter College Leadership and Community Service Award, UC Santa Cruz.
2013 - 2016   Dean's Honors, UC Santa Cruz - all terms attended.

Additional Research Experience

Summ 2021   Visiting Graduate Student, *University of Waterloo*, with Prof. Eric Blais
Summ 2020   Visiting Graduate Student, *Boston University*, with Prof. Sofya Raskhodnikova
Summ 2015   Guest Researcher at *DIMACS REU Program*, *Rutgers University*
            Selected participant in *DIMACS/DIMATIA Exchange Program*

Teaching

Spring 2023   Teaching Assistant - CS 260B, *Algorithmic Machine Learning*, UCLA
Fall 2022   Teaching Assistant - CS 181, *Introduction to Theoretical Computer Science*, UCLA
Winter 2022   Teaching Assistant - CS 181, *Introduction to Formal Languages and Automata Theory*, UCLA
Fall 2021   Teaching Assistant - CS 181, *Introduction to Theoretical Computer Science*, UCLA
Spring 2021   Teaching Assistant - CS 32, *Introduction to Computer Science II*, UCLA
Winter 2021   Teaching Assistant - CS 32, *Introduction to Computer Science II*, UCLA
Fall 2020   Teaching Assistant - CS 181, *Introduction to Theoretical Computer Science*, UCLA
Spring 2020   Teaching Assistant - CS 180, *Introduction to Algorithms and Complexity*, UCLA
Fall 2017   Teaching Assistant - CMPS 12B, *Introduction to Data Structures*, UC Santa Cruz
Fall 2015   MSI Learning Assistant - CMPS 101, *Algorithms and Abstract Data Types*, UC Santa Cruz
2014 - 2016   MSI Learning Assistant - CMPE 16, *Discrete Mathematics*, UC Santa Cruz
2014   Mathematics Tutor - *Calculus, Trigonometry, and Algebra*, Santa Rosa Junior College

Professional Service

Program committee member - ITCS 2025
External journal reviewer - TOCT 2018, SIDMA 2018, TCS 2024
External conference reviewer - SOSA 2020, SODA 2021, ICALP 2021, ICALP 2022, FOCS 2022, FOCS 2023, STOC 2024, FORC 2024, FOCS 2024, SODA 2025, STOC 2025