

Antares Chen

Graduate Student at the University of Chicago

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Education

Ph.D. in Computer Science June, 2026 (Expected)
University of Chicago
Advised by: Prof. Lorenzo Orecchia

Thesis: *Variational Perspectives on First-Order Methods, with Applications to Designing Fast Graph Algorithms*

M.S. in Computer Science December, 2023
University of Chicago
Committee: Profs. Julia Chuzhoy, Lorenzo Orecchia, Madhur Tulsiani

Thesis: *(Hyper) Graph Partitioning: Past and Present*

B.A. in Computer Science and Mathematics May, 2020
University of California Berkeley

Academic Experience

Visiting Researcher	Yale University Advised by Prof. Sekhar Tatikonda	(2025 – current)
-	Studied analyzing accelerated first-order methods using continuous-time dynamics, variational principles for first-order methods, and applications of belief propagation to solving linear systems.	
Visiting Researcher	Bocconi University Advised by Prof. Luca Trevisan	(2022)
-	Studied rank-constrained semidefinite programming relaxations for planted bisection using techniques from statistical physics.	
Visiting Researcher	Bocconi University Advised by Prof. Luca Trevisan	(2019)
-	Studied different notions of graph sparsification, and methods of analyzing cuts of random graph ensembles using tools from statistical physics.	
Research Assistant	University of California Berkeley Advised by Aaron Schild	(2016 – 2019)
-	Studied applications of electrical flows to graph sparsification, and solving Laplacian linear systems.	
-	Developed algorithms for efficiently simulating the Abelian sandpile model on undirected graphs.	
	Advised by Prof. Satish Rao	

	- Studied methods from online optimization: experts, bandits, online local learning.	
Research Assistant	Berkeley Institute of Design Advised by Prof. Armando Fox	(2015 – 2016)
	- Developed AutoStyle, an application that provides students automated coding style feedback via clustering abstract syntax trees. - Deployed AutoStyle to classroom settings with +1500 students.	
Research Assistant	Stanford University Computational Geometry Group Advised by Jonathan Huang	(2014)
	- Studied methods for clustering Fitch style proofs for the purpose of designing automated feedback systems.	
Research Assistant	University of Maryland College Park Advised by Prof. Aravind Srinivasan and David G. Harris	(2013 – 2015)
	- Studied the algorithmic Lovász Local Lemma and its applications to rounding covering integer linear programs.	

Industry Experience

Student Researcher	Google Member of the Data Commons project [link].	(2018 – 2019)
	- Assisted in curating an open source knowledge graph of public data sets. - Implemented and deployed a Python API for querying the Data Commons knowledge graph [Github]. - Lead the Data Commons pilot in UC Berkeley's DS100 [blog post].	

Writing

Journals

1. "Partial resampling to approximate covering integer programs." Antares Chen, David G. Harris & Aravind Srinivasan in *Random Structures & Algorithms* 58.1 (2021): 68-93. [[wiley](#)]

Conference Proceedings

1. "Submodular Hypergraph Partitioning: Metric Relaxations and Fast Algorithms via an Improved Cut-Matching Game." Antares Chen, Lorenzo Orecchia & Erasmo Tani in *Proceedings of the 52nd International Colloquium on Automata, Languages, and Programming 2025*. [[arXiv](#)] [[drops](#)]
2. "Top-K ranking with a monotone adversary" Yuepeng Yang, Antares Chen, Lorenzo Orecchia & Cong Ma in *Proceedings of Thirty Seventh Conference on Learning Theory 2024*. [[arXiv](#)] [[pmlr](#)]
3. "Cut sparsification of the clique beyond the ramanujan bound: a separation of cut versus spectral sparsification." Antares Chen, Jonathan Shi & Luca Trevisan in *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms 2022*. [[arXiv](#)] [[siam](#)]
4. "Teaching students to recognize and implement good coding style." Eliane S. Wiese, Michael Yen, Antares Chen, Lucas A. Santos & Armando Fox in *Proceedings of the ACM Conference on Learning at Scale 2017*, pp. 41-50. [[acm](#)]
5. "Partial resampling to approximate covering integer programs." Antares Chen, David G. Harris & Aravind Srinivasan in *Proceedings of the ACM-SIAM Symposium on Discrete Algorithms 2016*, pp. 1984-2003. [[arXiv](#)] [[siam](#)]

Preprints / Technical Reports

1. "Local algorithms and the failure of log-depth quantum advantage on sparse random CSPs" Antares Chen, Neng Huang & Kunal Marwaha. 2023. [[arXiv](#)]
2. "Hypergraph diffusions and resolvents for norm-based hypergraph Laplacians" Konstantinos Ameranis, Antares Chen, Adela Frances DePavia, Lorenzo Orecchia & Erasmo Tani. 2023. [[arXiv](#)]
3. "AutoStyle: scale-driven hint generation for coding style." Rohan R. Choudhury, Hezheng Yin, Joseph Moghadam, Antares Chen & Armando Fox in *Technical Report No. UCB/EECS-2016-40*. 2016. [[link](#)]

Abstracts

1. "Preliminary evidence for learning good coding style with Autostyle." Antares Chen, Eliane S. Wiese, Hezheng Yin & Armando Fox in *Learning with MOOCs 2016* [[link](#)]

Presentations

1. *Yale Theory Student Seminar* (2025)
"Belief propagation"
2. *International Colloquium on Automata, Languages, and Programming 2025* (2025)
"Submodular hypergraph partitioning"
3. *Yale Theory Student Seminar* (2025)
"Variational principles for first-order methods"
4. *Yale Theory Student Seminar* (2025)
"A recent result on fast hypergraph partitioning"
5. *University of Chicago Theory Lunch* (2022)
"Spectral graph theory without a spectrum II: Partitioning hypergraphs via network flows"
6. *University of Chicago Theory Lunch* (2022)
"Solving covering / packing LPs via saddle-point problems"
7. *ACM-SIAM Symposium on Discrete Algorithms 2016* (2016)
"Partial resampling to approximate covering integer programs"
8. *Learning with MOOCs 2016* (2016)
"Preliminary evidence for learning good coding style with Autostyle"

Teaching

Sp2024	<i>CMSC 27200: Theory of Algorithms</i> Head Graduate Student Instructor	University of Chicago
Fa2023	<i>CMSC 27100: Discrete Mathematics</i> Graduate Student Instructor	University of Chicago
Fa2023	<i>TTIC 31080: Approximation Algorithms</i> Graduate Student Instructor	Toyota Institute of Technology
Wi2021	<i>CMSC 27200: Theory of Algorithms</i> Graduate Student Instructor	University of Chicago
Sp2019	<i>CS170 Efficient Algorithms and Intractable Problems</i> Undergraduate Student Instructor	University of California Berkeley

Su2017	<i>CS375 Teaching Techniques for Computer Science</i> Undergraduate Student Instructor	University of California Berkeley
Su2016 – Sp2018	<i>CS61B(L) Data Structures and Programming</i> (Head) Undergraduate Student Instructor	University of California Berkeley

Advising / Mentorship

Undergraduate students

Supervised through the University of Chicago's Department of Computer Science

- 1. Ethan Koroma (2024)
- 2. William Hu
Now a PhD student at Rutgers University (2023 – 2024)
- 3. Rebecca (Bex) Golovanov
Now a PhD students at Northeastern University (2023)
- 4. Kelly Mao
Now at United Airlines (2023)
- 5. Andy J. Yang (2022 - 2023)
Now a PhD student at Notre Dame University

Supervised through the University of Chicago's Mathematics Research Experience for Undergraduates – This is an 8-week Summer program where students participate in open-ended research, and summarize their studies by writing a thesis. [link]

- 1. Rohan Buluswar (2024)
“Analysis of Langevin diffusions”
- 2. Glen Cahilly (2024)
“Counterfactual regret minimization: intuition, theory, and application”
- 3. Pascal Descollonges (2024)
“Moore-type bounds in hypergraphs”
- 4. James Gillibrand (2024)
“Exposition on the connection between descent methods and Hamiltonian mechanics”
- 5. Junfei Sun (2024)
“A Hamiltonian perspective on Sherman’s area-convexity algorithm”
- 6. William Hu (2023)
“Graph partitioning and multi-way Cheeger inequalities”
- 7. Daniel Katari (2023)
“High conductance expander graphs: constructions and bounds”
- 8. Dow Lafevers (2023)
“The relationship between expansion and the Unique Games Conjecture”
- 9. Lucas Tucker (2023)
“Dimensionality reduction and the Fenchel game”
- 10. William Spencer (2023)
“High conductance expander graphs: constructions and bounds”

Honors / Awards

1. *National Science Foundation* (2021)
Graduate Research Fellowship [[link](#)]
2. *Doolittle Institute's Mini-Urban Challenge* (2015)
Best Technical Presentation: Montgomery Blair Waffle Revengeance [[link](#)]
3. *Toshiba / NSTA ExploraVision Honorable Mention* (2014)
“Utilizing Carbon Nanotube Field Effect Transistors in Computer Design” [[link](#)]

Community Activities

Organizer	Yale Student Theory Day 2025 [link]	(2025)
Reviewer	Transactions on Machine Learning	(2024, 2025)
Election Judge	Chicago Board of Election Commissioners	(2020, 2024)
Reviewer	SIAM Conference on Applied and Computational Discrete Algorithms	(2023)
Organizer	University of Chicago Theory Lunch [link]	(2022)
Reviewer	Thirty-Fifth Annual Conference on Neural Information Processing Systems	(2021)
Reviewer	12th Innovations in Theoretical Computer Science	(2021)
Founder	Undergraduate Theoretical Computer Science @ Berkeley [link]	(2018 – 2019)
	- Organized reading groups: <i>Convex Optimization and Maximum Flows</i> , <i>A Theorist’s Toolkit</i> , <i>Approximation Algorithms</i> , and <i>Algorithmic Analysis Beyond the Worst-Case</i>	

Skills

Programming	Python, Java, C, C++, Golang, Julia, Matlab, Mathematica, Javascript, HTML/CSS, L ^A T _E X
Miscellaneous	I make a mean gumbo