

Chao Xu

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Research Interests

Combinatorial Optimization · Computational Geometry · Algorithms

Education

- 2013-2018 PHD in Computer Science, University of Illinois at Urbana-Champaign
Advisors: Karthik Chandrasekaran and Chandra Chekuri.
- 2009-2013 BS in Mathematics and Applied Mathematics & Statistics with minor in Computer Science, Stony Brook University

Employment

- Oct.2021-
now **Assistant Professor, UESTC**, Chengdu, China.
School of Computer Science and Engineering.
- Mar.2020-
Mar.2021 **Software Engineer, Voleon**, Berkeley, CA, USA.
Research Engineering.
- Sep.2019-
Mar.2020 **Senior Software Engineer, Grab**, Bellevue, WA, USA.
Grab Artificial Intelligence Accelerator.
- Jun.2018-
Aug.2019 **Research Scientist, Yahoo! Research**, New York, NY, USA.
Scalable Machine Learning Group.
- Feb.-Aug.
2013 **Software Engineer, Google**, Mountain View, CA, USA.
Google Analytics Backend.

Visiting Positions

- Jun.-Aug.
2017 **Visiting Researcher, National Institute of Informatics**, Tokyo, Japan.
Hosted by Ken-ichi Kawarabayashi.
- Jun.-Aug.
2015 **Visiting Scholar, New York University**, New York, USA.
Hosted by Boris Aronov.

Conference Publications¹

- 2023 T. Hirayama, Y. Liu, K. Makino, K. Shi, and C. Xu. A Polynomial Time Algorithm for Finding a Minimum 4-Partition of a Submodular Function. In **SODA 2023** (to appear).
- 2022* P. Yu, C. Xu, A. Bifet, and J. Read. Linear TreeShap. In **NeurIPS 2022** (to appear).
- 2022 C. Beideman, K. Chandrasekaran, C. Chekuri, and C. Xu. Approximate Representation of Symmetric Submodular Functions via Hypergraph Cut Functions. In **FSTTCS 2022** (to appear).
- 2022* J. Zhao, M. Xiao, and C. Xu. Improved Approximation Algorithms for the Traveling Tournament Problem. In S. Szeider, R. Ganian, and A. Silva, editors, *47th International Symposium on Mathematical Foundations of Computer Science (MFCS 2022)*, volume 241 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 83:1–83:15, Dagstuhl, Germany, 2022. Schloss Dagstuhl – Leibniz-Zentrum für Informatik.
- 2020 C. Beideman, K. Chandrasekaran, and C. Xu. Multicriteria Cuts and Size-Constrained k -Cuts in Hypergraphs. In J. Byrka and R. Meka, editors, *Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX/RANDOM 2020)*, volume 176 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 17:1–17:21, Dagstuhl, Germany, 2020. Schloss Dagstuhl–Leibniz-Zentrum für Informatik.
- 2019 C. Chekuri, K. Quanrud, and C. Xu. LP Relaxation and Tree Packing for Minimum k -cuts. In J. T. Fineman and M. Mitzenmacher, editors, *2nd Symposium on Simplicity in Algorithms (SOSA 2019)*, volume 69 of *OpenAccess Series in Informatics (OASIcs)*, pages 7:1–7:18, Dagstuhl, Germany, 2018. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik.
- 2018 K. Chandrasekara, C. Xu, and X. Yu. Hypergraph k -cut in randomized polynomial time. In *Proceedings of the Twenty-Ninth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1426–1438, 2018.
- 2017 K. Bérczi, K. Chandrasekaran, T. Király, E. Lee, and C. Xu. Global and Fixed-Terminal Cuts in Digraphs. In *Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX/RANDOM 2017)*, volume 81 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 2:1–2:20, Dagstuhl, Germany, 2017.
- 2017 K. Koiliaris and C. Xu. A faster pseudopolynomial time algorithm for subset sum. In *Proceedings of the Twenty-Eighth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1062–1072. SIAM, 2017.
- 2017 C. Chekuri and C. Xu. Computing minimum cuts in hypergraphs. In *Proceedings of the Twenty-Eighth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1085–1100. SIAM, 2017.
- 2015 C. Chekuri, T. Rukkanchanunt, and C. Xu. On element-connectivity preserving graph simplification. In N. Bansal and I. Finocchi, editors, *Algorithms - ESA 2015*, volume 9294 of *Lecture Notes in Computer Science*, pages 313–324. Springer Berlin Heidelberg, 2015.
- 2015 H.-C. Chang, J. Erickson, and C. Xu. Detecting weakly simple polygons. In *Proceedings of the Twenty-Sixth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 1655–1670. SIAM, 2015.

¹By convention in theoretical computer science and mathematics, author orders of all papers are alphabetical.

* the author order is determined by contribution.

Journal Publications

- 2021 C. Beideman, K. Chandrasekaran, and C. Xu. Multicriteria cuts and size-constrained k -cuts in hypergraphs. ***Mathematical Programming***, 2021.
- 2020 K.-i. Kawarabayashi and C. Xu. Minimum violation vertex maps and their applications to cut problems. ***SIAM Journal on Discrete Mathematics***, 34(4):2183–2207, 2020.
- 2020 A. Gharehgozli, C. Xu, and W. Zhang. High multiplicity asymmetric traveling salesman problem with feedback vertex set and its application to storage/retrieval system. ***European Journal of Operational Research***, 289(2):495–507, 2021.
- 2020 C. Chekuri, K. Quanrud, and C. Xu. LP Relaxation and Tree Packing for Minimum k -Cut. ***SIAM Journal on Discrete Mathematics***, 34(2):1334–1353, 2020.
- 2019 K. Chandrasekaran, C. Xu, and X. Yu. Hypergraph k -cut in randomized polynomial time. ***Mathematical Programming***, 186:85–113, March 2021.
- 2019 K. Koiliaris and C. Xu. Faster pseudopolynomial time algorithms for subset sum. ***ACM Trans. Algorithms***, 15(3):40:1–40:20, June 2019.
- 2018 C. Chekuri and C. Xu. Minimum cuts and sparsification in hypergraphs. ***SIAM Journal on Computing***, 47(6):2118–2156, 2018.
- 2018 C. Xu and Q. Zhang. The shortest kinship description problem. ***Information Processing Letters***, 138:61 – 66, 2018.
- 2018 K. Bérczi, K. Chandrasekaran, T. Király, E. Lee, and C. Xu. Beating the 2-approximation factor for global bicut. ***Mathematical Programming***, 177(1):291–320, Sep 2019.
- 2016 C. Xu. Reconstructing edge-disjoint paths faster. ***Operations Research Letters***, 44(2):174 – 176, 2016.
- 2013 N. J. Calkin, J. E. Janoski, A. Nelson, S. Ryan, and C. Xu. Champion spiders in the game of Graph Nim. ***Congr. Numer.***, 218:5–19, 2013.