

Stanford



Mary Wootters

Assistant Professor of Computer Science and of Electrical Engineering

Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Computer Science
- Assistant Professor, Electrical Engineering
- Member, Institute for Computational and Mathematical Engineering (ICME)

LINKS

- Personal website: <http://sites.google.com/site/marywootters>

Teaching

COURSES

2022-23

- Citizenship in the 21st Century: COLLEGE 102 (Win)
- Design and Analysis of Algorithms: CS 161 (Spr)
- Problem-Solving Lab for CS161: CS 161A (Spr)
- Randomized Algorithms and Probabilistic Analysis: CME 309, CS 265 (Aut)

2021-22

- Algebraic Error Correcting Codes: CS 250, EE 387 (Win)
- Randomized Algorithms and Probabilistic Analysis: CS 265 (Win)
- Randomness: Computational and Philosophical Approaches: CS 57N, PHIL 3N (Win)

2020-21

- Algebraic Error Correcting Codes: CS 250, EE 387 (Win)
- Randomized Algorithms and Probabilistic Analysis: CME 309, CS 265 (Aut)

2019-20

- Design and Analysis of Algorithms: CS 161 (Win)
- Randomness: Computational and Philosophical Approaches: CS 57N, PHIL 3N (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Joshua Brakensiek, Benedikt Bünz, Kabir Chandrasekher, Jay Mardia, Shaked Regev, Declan Thompson

Postdoctoral Faculty Sponsor

Ani Krishna

Orals Evaluator

Benedikt Bünz

Doctoral Dissertation Advisor (AC)

Yun Liao

Master's Program Advisor

Michael Chang, Pranav Jain, Crystal Liu, Rita Meraz, Carmen Strassle, Qingyue Wei, Yi-Chia Wu

Doctoral (Program)

Keller Blackwell, Margalit Glasgow, Jay Mardia, Kamilla Nazirkhanova, Joachim Neu

Publications

PUBLICATIONS

- **Bounds for List-Decoding and List-Recovery of Random Linear Codes** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Guruswami, V., Li, R., Moshieff, J., Resch, N., Silas, S., Wootters, M.
2022; 68 (2): 923-939
- **Threshold Rates for Properties of Random Codes** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Guruswami, V., Moshieff, J., Resch, N., Silas, S., Wootters, M.
2022; 68 (2): 905-922
- **Linear-Time Erasure List-Decoding of Expander Codes** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Ron-Zewi, N., Wootters, M., Zemor, G.
2021; 67 (9): 5827-5839
- **Improved List-Decodability of Random Linear Binary Codes**
Li, R., Wootters, M.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2021: 1522–36
- **Embedded Index Coding**
Porter, A., Wootters, M.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2021: 1461–77
- **Lifted Multiplicity Codes and the Disjoint Repair Group Property** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Li, R., Wootters, M.
2021; 67 (2): 716–25
- **Superbridge and bridge indices for knots** *JOURNAL OF KNOT THEORY AND ITS RAMIFICATIONS*
Adams, C., Agarwal, N., Allen, R., Khandhawit, T., Simons, A., Winarski, R., Wootters, M.
2021; 30 (2)
- **Weighted Matrix Completion From Non-Random, Non-Uniform Sampling Patterns** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Foucart, S., Needell, D., Pathak, R., Plan, Y., Wootters, M.
2021; 67 (2): 1264–90
- **Hermitian-lifted codes** *DESIGNS CODES AND CRYPTOGRAPHY*
Lopez, H. H., Malmskog, B., Matthews, G. L., Pinero-Gonzalez, F., Wootters, M.
2021
- **Illusion of large on-chip memory by networked computing chips for neural network inference** *NATURE ELECTRONICS*
Radway, R. M., Bartolo, A., Jolly, P. C., Khan, Z. F., Le, B. Q., Tandon, P., Wu, T. F., Xin, Y., Vianello, E., Vivet, P., Nowak, E., Wong, H., Aly, et al

2021

- **Wedge-Lifted Codes**
Hastings, J., Kanne, A., Li, R., Wootters, M., IEEE
IEEE.2021: 2990-2995
- **Approximate Gradient Coding with Optimal Decoding**
Glasgow, M., Wootters, M., IEEE
IEEE.2021: 2280-2285
- **On Greedy Approaches to Hierarchical Aggregation**
Porter, A., Wootters, M., IEEE
IEEE.2021: 2649-2654
- **On Coding for an Abstracted Nanopore Channel for DNA Storage**
Hulett, R., Chandak, S., Wootters, M., IEEE
IEEE.2021: 2465-2470
- **LOCAL LIST RECOVERY OF HIGH-RATE TENSOR CODES AND APPLICATIONS** *SIAM JOURNAL ON COMPUTING*
Hemenway, B., Ron-Zewi, N., Wootters, M.
2020; 49 (4)
- **Linear-time Erasure List-decoding of Expander Codes**
Ron-Zewi, N., Wootters, M., Zemor, G., IEEE
IEEE.2020: 379-383
- **LDPC Codes Achieve List Decoding Capacity**
Mosheiff, J., Resch, N., Ron-Zewi, N., Silas, S., Wootters, M., IEEE
IEEE.2020: 458-469
- **Tight Limits on Nonlocality from Nontrivial Communication Complexity; a.k.a. Reliable Computation with Asymmetric Gate Noise**
Shutty, N., Wootters, M., Hayden, P., IEEE
IEEE.2020: 206-217
- **OVERCOMING HIGH NANOPORE BASECALLER ERROR RATES FOR DNA STORAGE VIA BASECALLER-DECODER INTEGRATION AND CONVOLUTIONAL CODES**
Chandak, S., Neu, J., Tatwawadi, K., Mardia, J., Lau, B., Kubit, M., Hulett, R., Griffin, P., Wootters, M., Weissman, T., Ji, H., IEEE
IEEE.2020: 8822–26
- **A Data-Compressive Wired-OR Readout for Massively Parallel Neural Recording**
Muratore, D., Tandon, P., Wootters, M., Chichilnisky, E. J., Mitra, S., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 1128–40
- **On the Optimality of the Kautz-Singleton Construction in Probabilistic Group Testing**
Inan, H. A., Kairouz, P., Wootters, M., Ozgur, A.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 5592–5603
- **Fast Blind MIMO Decoding Through Vertex Hopping** *IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS*
Dean, T. R., Perlstein, J. R., Wootters, M., Goldsmith, A. J.
2019; 18 (7): 3669–82
- **Repairing Multiple Failures for Scalar MDS Codes**
Mardia, J., Bartan, B., Wootters, M.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 2661–72
- **Blind Joint MIMO Channel Estimation and Decoding** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Dean, T. R., Wootters, M., Goldsmith, A. J.
2019; 65 (4): 2507–24
- **Resistive RAM Endurance: Array-Level Characterization and Correction Techniques Targeting Deep Learning Applications** *IEEE TRANSACTIONS ON ELECTRON DEVICES*

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- Grossi, A., Vianello, E., Sabry, M. M., Barlas, M., Grenouillet, L., Coignus, J., Beigne, E., Wu, T., Le, B. Q., Wootters, M. K., Zambelli, C., Nowak, E., Mitra, et al 2019; 66 (3): 1281–88
- **A 43pJ/Cycle Non-Volatile Microcontroller with 4.7 μ s Shutdown/Wake-up Integrating 2.3-bit/Cell Resistive RAM and Resilience Techniques**
Wu, T. F., Le, B. Q., Radway, R., Bartolo, A., Hwang, W., Jeong, S., Li, H., Tandon, P., Vianello, E., Vivet, P., Nowak, E., Wootters, M. K., Wong, et al
IEEE.2019: 226+
 - **A Data-Compressive Wired-OR Readout for Massively Parallel Neural Recording**
Muratore, D. G., Tandon, P., Wootters, M., Chichilnisky, E. J., Mitra, S., Murmann, B., IEEE
IEEE.2019
 - **Stochastic Gradient Coding for Flexible Straggler Mitigation in Distributed Learning**
Bitar, R., Wootters, M., El Rouayheb, S., IEEE
IEEE.2019: 394–98
 - **Embedded Index Coding**
Porter, A., Wootters, M., IEEE
IEEE.2019: 354–58
 - **Improved read/write cost tradeoff in DNA-based data storage using LDPC codes**
Chandak, S., Tatwawadi, K., Lau, B., Mardia, J., Kubit, M., Neu, J., Griffin, P., Wootters, M., Weissman, T., Ji, H., IEEE
IEEE.2019: 147–56
 - **The N3XT Approach to Energy-Efficient Abundant-Data Computing** *PROCEEDINGS OF THE IEEE*
Aly, M., Wu, T. F., Bartolo, A., Malviya, Y. H., Hwang, W., Hills, G., Markov, I., Wootters, M., Shulaker, M. M., Wong, H., Mitra, S.
2019; 107 (1): 19–48
 - **Linear-time list recovery of high-rate expander codes**
Hemenway, B., Wootters, M.
ACADEMIC PRESS INC ELSEVIER SCIENCE.2018: 202–18
 - **Fast Blind MIMO Decoding through Vertex Hopping**
Perlstein, J., Dean, T., Wootters, M., Goldsmith, A., Matthews, M. B.
IEEE.2018: 148–49
 - **Average-radius list-recoverability of random linear codes**
Rudra, A., Wootters, M., Assoc Comp Machinery
ASSOC COMPUTING MACHINERY.2018: 644–62
 - **On the Optimality of the Kautz-Singleton Construction in Probabilistic Group Testing**
Inan, H. A., Kairouz, P., Wootters, M., Ozgur, A., IEEE
IEEE.2018: 188–95
 - **On taking advantage of multiple requests in error correcting codes**
Ramakrishnan, P., Wootters, M., IEEE
IEEE.2018: 1340–44
 - **Load-Balanced Fractional Repetition Codes**
Porter, A., Silas, S., Wootters, M., IEEE
IEEE.2018: 2072–76
 - **Improved decoding of Folded Reed-Solomon and Multiplicity Codes**
Kopparty, S., Ron-Zewi, N., Saraf, S., Wootters, M., Thorup, M.
IEEE COMPUTER SOC.2018: 212–23
 - **Repairing Reed-Solomon Codes**
Guruswami, V., Wootters, M.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2017: 5684–98
 - **Exponential Decay of Reconstruction Error From Binary Measurements of Sparse Signals** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Baraniuk, R. G., Foucart, S., Needell, D., Plan, Y., Wootters, M.

2017; 63 (6): 3368–85

- **De-biasing low-rank projection for matrix completion**
Foucart, S., Needell, D., Plan, Y., Wootters, M., Lu, Y. M., VanDeVille, D., Papadakis, M.
SPIE-INT SOC OPTICAL ENGINEERING.2017
- **Repairing multiple failures for scalar MDS codes**
Bartan, B., Wootters, M., IEEE
IEEE.2017: 1145–52
- **Blind Joint MIMO Channel Estimation and Decoding**
Dean, T., Wootters, M., Goldsmith, A., IEEE
IEEE.2017
- **Limitations of Piggybacking Codes with Low Substriping**
Hulett, R., Wootters, M., IEEE
IEEE.2017: 1131–38
- **SPECIAL ISSUE: APPROX-RANDOM 2015 Foreword** *THEORY OF COMPUTING*
Megow, N., Wootters, M.
2016; 12
- **Local correctability of expander codes**
Hemenway, B., Ostrovsky, R., Wootters, M.
ACADEMIC PRESS INC ELSEVIER SCIENCE.2015: 178–90
- **Linear-Time List Recovery of High-Rate Expander Codes**
Hemenway, B., Wootters, M., Halldorsson, M. M., Iwama, K., Kobayashi, N., Speckmann, B.
SPRINGER-VERLAG BERLIN.2015: 701–12
- **Configuration spaces of convex and embedded polygons in the plane** *GEOMETRIAE DEDICATA*
Shimamoto, D., Wootters, M.
2014; 172 (1): 121–34
- **1-Bit matrix completion** *INFORMATION AND INFERENCE-A JOURNAL OF THE IMA*
Davenport, M. A., Plan, Y., van den Berg, E., Wootters, M.
2014; 3 (3): 189–223
- **Optimal entanglement-assisted one-shot classical communication** *PHYSICAL REVIEW A*
Hemenway, B., Miller, C. A., Shi, Y., Wootters, M.
2013; 87 (6)
- **Lower Bounds for Quantized Matrix Completion**
Wootters, M., Plan, Y., Davenport, M. A., van den Berg, E., IEEE
IEEE.2013: 296–+
- **Local Correctability of Expander Codes**
Hemenway, B., Ostrovsky, R., Wootters, M., Fomin, F. V., Freivalds, R., Kwiatkowska, M., Peleg, D.
SPRINGER-VERLAG BERLIN.2013: 540–51
- **REUSABLE LOW-ERROR COMPRESSIVE SAMPLING SCHEMES THROUGH PRIVACY**
Gilbert, A. C., Hemenway, B., Strauss, M. J., Woodruff, D. P., Wootters, M., IEEE
IEEE.2012: 536–39