CURRICULUM VITAE

Hsin-Po Wang   王新博

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Education

| Ph.D in Math | University of Illinois Urbana-Champaign, Illinois | 2016–2021 |
| BSc in Math | National Taiwan University (國立臺灣大學), Taiwan | 2011–2015 |

Employment

Apple Research Fellow   January–May 2024
Simons Institute for the Theory of Computing, California

Postdoctoral Scholar   October 2022–December 2023
Department of Electrical Engineering and Computer Sciences,
University of California, Berkeley, California

Postdoctoral Scholar   October 2021–September 2022
Department of Electrical and Computer Engineering,
University of California San Diego, California

Teaching Assistant   September 2016–May 2023
Department of Mathematics,
University of Illinois Urbana-Champaign, Illinois

Awards and Honors

Irving Reiner Memorial Award in Algebra   2021

Research Assistant Fellowship   Spring 2020

Teacher ranked as excellent by their students Fall 2019, Spring 2019, Spring 2018

書卷獎 (top 5% GPA)   Fall 15, Spring 14, Spring 13, Fall 12, Spring 12, Fall 11

蕭正堂紀念獎學金 (Prof. Cheng-Tang Hsiao Memorial Scholarship)   2014

胡達開先生紀念獎學金 (Prof. Ta-Kai Hu Memorial Scholarship)   2013

Research Interests

I am interested in information theory and coding theory. I have worked on polar codes (wireless communication), regenerating codes (cloud storage), distributed matrix–matrix multiplication (cloud computation), group testing (with many downstream applications), and DNA data storage. I specialize in finding applications of algebra, combinatorics, calculus, probability theory, and other mathematical tools to said topics.

Journal Publications (new to old)

[J6] H.-P. Wang and R. Gabrys and A. Vardy. Tropical Group Testing. *IEEE Transactions on Information Theory*. June 2023.

[J5] H.-P. Wang, T.-C. Lin, A. Vardy, R. Gabrys. Sub-4.7 Scaling Exponent of Polar Codes. *IEEE Transactions on Information Theory*. March 2023

[J4] I. Duursma, H.-P. Wang. Multilinear Algebra for Minimum Storage Regenerating Codes: A Generalization of Product-Matrix Construction. *Applicable Algebra in Engineering, Communication and Computing*. October 2021.

[J3] I. Duursma, X. Li, H.-P. Wang. Multilinear Algebra for Distributed Storage. *SIAM Journal on Applied Algebra and Geometry (SIAGA)*. September 2021.

[J2] H.-P. Wang, I. Duursma. Log-logarithmic Time Pruned Polar Coding. *IEEE Transactions on Information Theory*. March 2021.

[J1] H.-P. Wang, I. Duursma. Polar Codes' Simplicity, Random Codes' Durability. *IEEE Transactions on Information Theory*. March 2021.

Peer-Reviewed Conference Publications (new to old)

[C10] H.-P. Wang, C.-W. Chin. On Counting Subsequences and Higher-Order Fibonacci Numbers. *IEEE International Symposium on Information Theory (ISIT)*. July 2024.

[C9] H.-P. Wang, V. Guruswami. Successive Cancellation Sampling Decoder: An Attempt to Analyze List Decoding Theoretically. *IEEE International Symposium on Information Theory (ISIT)*. July 2024.

[C8] H.-P. Wang, V. Guruswami. Isolate and then Identify: Rethinking Adaptive Group Testing. *IEEE International Symposium on Information Theory (ISIT)*. July 2024.

[C7] H.-P. Wang, R. Gabrys, V. Guruswami. Quickly-Decodable Group Testing with Fewer Tests: Price-Scarlett's Nonadaptive Splitting with Explicit Scalars. *IEEE International Symposium on Information Theory (ISIT)*. June 2023.

[C6] H.-P. Wang, C.-W. Chin. Density Devolution for Ordering Synthetic Channels. *IEEE International Symposium on Information Theory (ISIT)*. June 2023.

[C5] T.-C. Lin, H.-P. Wang. Optimal Self-Dual Inequalities to Order Polarized BECs. *IEEE International Symposium on Information Theory (ISIT)*. June 2023.

[C4] H.-P. Wang, V. Guruswami. How Many Matrices Should I Prepare to Polarize Channels Optimally Fast? *IEEE International Symposium on Information Theory (ISIT)*. June 2023.

[C3] H.-P. Wang, V.-F. Dragoi. Fast Methods for Ranking Synthetic BECs. *IEEE International Symposium on Information Theory (ISIT)*. June 2023.

[C2] I. Duursma, R. Gabrys, V. Guruswami, T.-C. Lin, H.-P. Wang. Accelerating Polarization via Alphabet Extension. *International Conference on Randomization and Computation (RANDOM)*. September 2022.

[C1] H.-P. Wang, R. Gabrys, A. Vardy. PCR, Tropical Arithmetic, and Group Testing. *IEEE International Symposium on Information Theory (ISIT)*. June 2022.

Invited Talks (new to old)

[T3] GenoWeave: Interleaving Polar Codes Across Strands for DNA Data Storage. *Information Theory and Applications Workshop (ITA)*. February 2024.

[T2] Channel Manipulation as a Coding Technique. *Joint Mathematics Meetings (JMM)*. January 2024.

[T1] Moulin Codes. *SIAM Conference on Applied Algebraic Geometry (AG21)*. August 2021.