CURRICULUM VITAE

Hsin-Po Wang 王新博

Google Scholar: https://scholar.google.com/citations?user=tJ8-ChgAAAAJ

Website: https://www.symbol.codes Email: a.simple.people@gmail.com

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
Book–Scroll Award (top 5% GPA)	Fall 15, Spring 14, Spring 13, Fall 12, Spring 12, Fall 11
Prof. Cheng-Tang Hsiao Memorial Scholarship (蕭正堂紀念獎學金)	2014
Prof. Ta-Kai Hu Memorial Scholarship (胡達開先生紀念獎學金)	2013

Research Interests

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

Peer-Reviewed Conference Publications (new to old)

[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. https://doi.org/10.1109/ISIT54713.2023.10206843

[C6] H.-P. Wang, C.-W. Chin. *Density Devolution for Ordering Synthetic Channels*. IEEE International Symposium on Information Theory (ISIT). June 2023. https://doi.org/10.1109/ISIT54713.2023.10206540

[C5] T.-C. Lin, H.-P. Wang. *Optimal Self-Dual Inequalities to Order Polarized BECs*. IEEE International Symposium on Information Theory (ISIT). June 2023. https://doi.org/10.1109/ISIT54713.2023.10206451

[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. https://doi.org/10.1109/ISIT54713.2023.10206989

[C3] H.-P. Wang, V.-F. Dragoi. *Fast Methods for Ranking Synthetic BECs*. IEEE International Symposium on Information Theory (ISIT). June 2023. https://doi.org/10.1109/ISIT54713.2023.10206704

[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. https://doi.org/10.4230/LIPIcs.APPROX/RANDOM.2022.17

[C1] H.-P. Wang, R. Gabrys, A. Vardy. *PCR, Tropical Arithmetic, and Group Testing*. IEEE International Symposium on Information Theory (ISIT). June 2022. https://doi.org/10.1109/ISIT50566.2022.9834718

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. https://ieeexplore.ieee.org/document/10146331/

[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 https://doi.org/10.1109/TIT.2023.3253074

[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. https://doi.org/10.1007/s00200-021-00526-3

[J3] I. Duursma, X. Li, H.-P. Wang. *Multilinear Algebra for Distributed Storage*. SIAM Journal on Applied Algebra and Geometry (SIAGA). September 2021. https://doi.org/10.1137/20M1346742

[J2] H.-P. Wang, I. Duursma. *Log-logarithmic Time Pruned Polar Coding*. IEEE Transactions on Information Theory. March 2021. https://doi.org/10.1109/TIT.2020.3041523

[J1] H.-P. Wang, I. Duursma. *Polar Codes' Simplicity, Random Codes' Durability*. IEEE Transactions on Information Theory. March 2021. https://doi.org/10.1109/TIT.2020.3041570

Invited Talks (new to old)

[T3] H.-P. Wang. *Intra-Strand Inner Polar Codes for DNA Storage*. Information Theory and Applications Workshop (ITA). February 2024.

[T2] H.-P. Wang. *Channel Manipulation as a Coding Technique*. Joint Mathematics Meetings (JMM). January 2024. https://meetings.ams.org/math/jmm2024/meetingapp.cgi/Paper/29146

[T1] H.-P. Wang. *Moulin Codes*. SIAM Conference on Applied Algebraic Geometry (AG21). August 2021. https://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=72368