

Curriculum Vitae

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September 2023

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I received a bachelor's degree in mathematics from National Taiwan University in 2015 and a Ph.D. degree in mathematics from the University of Illinois Urbana-Champaign in 2021. After spending a year as a Postdoctoral Scholar in the Department of ECE at UC San Diego, I am currently a Postdoctoral Scholar in the Department of EECS at UC Berkeley. I have worked on polar codes, distributed storage, distributed computation, and group testing. I am specialized at applying algebra, combinatorics, calculus, probability theory and other mathematics tools to these topics.

I Education

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| Ph.D in Mathematics | 2016–2021 |
| University of Illinois Urbana-Champaign | |
| Advisor: Iwan Duursma | |
| Dissertation: <i>Complexity and Second Moment of the Mathematical Theory of Communication</i> | |
| Bachelor of Science in Mathematics | 2011–2015 |
| National Taiwan University (國立臺灣大學) | |

II Employment

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| Research Fellowship | January–May 2024 |
| Simons Institute for the Theory of Computing | |
| Postdoctoral Scholar | October 2022–Present |
| Department of Electrical Engineering and Computer Sciences | |
| University of California, Berkeley | |
| Postdoctoral Scholar | October 2021–September 2022 |
| Department of Electrical and Computer Engineering | |
| University of California San Diego | |

III Research Interests

• Information theory • Coding theory • Polar codes • Distributed storage • Distributed computation
• Group testing • Applications of algebra, combinatorics, calculus, probability theory and other mathematics tools

IV Awards and Honors

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| 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 |

V Peer-Reviewed Conference Publications

- [1] 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>
- [2] 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>
- [3] 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>
- [4] 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>
- [5] 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>
- [6] 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>
- [7] 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>

VI Journal Publications

- [1] 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/>
- [2] 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>
- [3] 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>
- [4] 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>
- [5] 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>
- [6] 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>