JUNREN CHEN

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Profile

Junren Chen is currently a final-year PhD candidate at Department of Mathematics, The University of Hong Kong. His PhD research revolves around the mathematical foundations and computationally efficient algorithms for problems in signal processing, statistics and machine learning. He is expected to graduate in June 2025. His research interests include *high-dimensional statistics, non-convex optimization, statistical signal processing, machine learning and mathematics of data science.*

Education

Department of Mathematics, University of Hong Kong — *Hong Kong*
Ph.D. in Applied and Computational Mathematics — *Sep 2021 - June 2025 (expected)*
- Advisor: Prof. Michael K. Ng

School of Mathematics, Sun Yat-sen University — *Guangzhou, China*
B.Sc. in Mathematics and Applied Mathematics — *Sep 2017 - June 2021*
- Ranking: 1/130 (Major GPA & Overall GPA)

Visiting Experience

Department of Statistics, Columbia University — *New York, USA*
Visiting Graduate Student — *Jan 2024 - July 2024*
- Host: Prof. Ming Yuan. Topic: Phase retrieval, tensors.

Department of Computer Science, National University of Singapore — *Singapore*
Visiting Graduate Student — *June 2023 - Sep 2023*
- Host: Prof. Jonathan Scarlett. Topic: Group testing.

Publication List

(⋆) Representative Paper

1. **J. Chen**, M. K. Ng, Z. Liu. Solving Quadratic Systems with Full-Rank Matrices Using Sparse or Generative Priors.
   IEEE Transactions on Signal Processing, 2025, to appear
2. **J. Chen**, M. Yuan. Optimal Quantized Compressed Sensing via Projected Gradient Descent. (⋆)
   Submitted, 2024
3. **J. Chen**, Z. Liu, M. K. Ng, J. Scarlett. Robust Instance Optimal Phase-Only Compressed Sensing.
   Submitted, 2024
4. **J. Chen**, J. Scarlett. Exact Thresholds for Noisy Non-Adaptive Group Testing. (⋆)
   ACM-SIAM Symposium on Discrete Algorithms (SODA25), to appear.
5. Z. Liu, W. Li, **J. Chen**. Generalized Eigenvalue Problems with Generative Priors.
   Neural Information Processing Systems (NeurIPS 2024), to appear.
6. **J. Chen**, M. Yuan. One-Bit Phase Retrieval: Optimal Rates and Efficient Algorithms. (⋆)
   Submitted, 2024
7. Quantizing Heavy-tailed Data in Statistical Estimation: (Near) Minimax Rates, Covariate Quantization, Uniform Recovery.
   J. Chen, M. K. Ng, D. Wang.
   IEEE Transactions on Information Theory, 2024.
8. Uniform Recovery Guarantees for Quantized Corrupted Sensing Using Structured or Generative Priors.
   J. Chen, Z. Liu, M. Ding, M. K. Ng.
   SIAM Journal on Imaging Sciences, 2024.
9. **J. Chen**, Z. Liu. Efficient Algorithms for Non-gaussian Single Index Models with Generative Priors.
   AAAI Conference on Artificial Intelligence (AAAI), 2024.
10. **J. Chen**, M. K. Ng. A Parameter-Free Two-Bit Covariance Estimator with Improved Operator Norm Error Rate. (⋆)
    In Revision at *Applied and Computational Harmonic Analysis*, 2023
11. **J. Chen**, M. K. Ng. Phase Retrieval of Quaternion Signal via Wirtinger Flow.
    IEEE Transactions on Signal Processing, 2023.

12. **J. Chen**, M. K. Ng. Signal Reconstruction from Phase-only Measurements: Uniqueness Condition, Minimal Measurement Number and Beyond.
SIAM Journal on Applied Mathematics, 2023.
13. **J. Chen**, M. K. Ng. Uniform Exact Reconstruction of Sparse Signals and Low-rank Matrices from Phase-Only Measurements.
IEEE Transactions on Information Theory, 2023.
14. A Unified Framework for Uniform Signal Recovery in Nonlinear Generative Compressed Sensing. ($\star$)
J. Chen, J. Scarlett, M. K. Ng, Z. Liu.
Neural Information Processing Systems (NeurIPS 2023).
15. **J. Chen**, Y. Wang, M. K. Ng. Quantized Low-Rank Multivariate Regression with Random Dithering.
IEEE Transactions on Signal Processing, 2023.
16. High Dimensional Statistical Estimation under Uniformly Dithered One-bit Quantization. ($\star$)
J. Chen, C.-L. Wang, M. K. Ng, D. Wang.
IEEE Transactions on Information Theory, 2023.
17. **J. Chen**, M. K. Ng. Color Image Inpainting via Robust Pure Quaternion Matrix Completion: Error Bound and Weighted Loss.
SIAM Journal on Imaging Sciences, 2022.

Honors & Awards

- Hong Kong PhD Fellowship (2021-2025)
- China National Scholarship (2019, 2020)
- Undergraduate first class Scholarship (2018, 2019, 2020)

Teaching Experience

- MATH1009 - Basic Mathematics (Fall of 2022, 2023)
- MATH2014 - Multivariable Calculus and Linear Algebra (Spring of 2022, 2023, 2024)
- MATH3904 - Introduction to Optimization (Fall of 2024)

Selected Talks

- Estimation from quantized heavy-tailed measurements. [Jan 2023, University of Hong Kong, Hong Kong]
- Uniform Exact Reconstruction of Structured Signals from Phases. [Mar 2023, University of Hong Kong, Hong Kong]
- Exact thresholds for noisy group testing. [Jan 2025, SODA 2025, New Orleans, USA]