Heng Qiao

Curriculum Vitae

University of Michigan-Shanghai Jiao Tong University Joint Institute,
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Current Position

Assistant Professor, UM-SJTU Joint Institute, Shanghai Jiao Tong University, 2020 – present

Academic Affiliation

Member, IEEE Signal Processing Society

Education

Ph.D. in **Electrical Engineering**
University of California, San Diego, CA, USA, 2019
M.Sc. in **Electrical Engineering**
University of Maryland, College Park, MD, USA, 2016
B.E. in **Electronic Engineering**
Tsinghua University, Beijing, China, 2012

Honors & Awards

Leading Talents (Overseas), Shanghai, 2021
Best Student Paper Award Finalist (First Author), IEEE 11th SAM, 2020
Shannon Fellowship, University of California, San Diego, 2019
Qualcomm Fellow-Mentor-Advisor Fellowship, 2018
Best Student Paper Award Finalist (First Author), IEEE 7th CAMSAP, 2017
Best Student Paper Award (First Author, First Place), IEEE 42nd ICASSP, 2017

Distinguished Graduate Fellowship, University of Maryland, College Park, 2012

Good Graduate Award, Tsinghua University, 2012

Grants & Research Contracts

General Program, STCMC of Shanghai: Nonconvex Algorithms in Fourier Compressed Sensing with Structural Priors; 200K RMB; 2023.04 – 2026.03; H. Qiao (PI)

Young Scientists Program, NSFC: Robustness Analysis of Sparse Array based Direction-of-Arrival Estimation Algorithms with Finite Snapshots; 240K RMB; 2021.01 – 2023.12; H. Qiao (PI)

Sailing Program, STCMC of Shanghai: Robustness Analysis of Sparse Array based Direction-of-Arrival Estimation Algorithms; 200K RMB; 2020.07 – 2023.06; H. Qiao (PI)

Research Supervision & Advising

DOCTORAL ADVISING

Mingyu Jiang, 2022 – present

Hongqing Yu, 2021 – present

Wenzhe Lu, 2020 – present

MASTER ADVISING

Ziyi Wang, 2022 – present

Xingyun Mao, 2021 – present

Research Interests

Statistical Signal Processing, Array Signal Processing, Statistical Inference, Optimization Algorithm

Publications

Journals

[J10] **H. Qiao** and H. Yu, ``On Landscape of Nonconvex Regularized Least Squares for Sparse Support Recovery", IEEE Signal Processing Letters, vol 29, pp. 2467-2471, 2022.

[J9] W. Lu and **H. Qiao**, ``Correlation-Aware Joint Support Recovery with Separation Prior", IEEE Signal Processing Letters, vol 29, pp. 1739-1743, 2022.

[J8] **H. Qiao**, ``On the Performance of the SPICE Method", IEEE Signal Processing Letters, vol 28, pp. 543-547, 2021.

[J7] **H. Qiao**, ``A Universal Technique for Analysing Discrete Super-Resolution Algorithms", IEEE Signal Processing Letters, vol 27, pp. 1829-1833, 2020.

[J6] **H. Qiao**, ``Estimating the Number of Sinusoids in Additive Sub-Gaussian Noise with Finite Measurements", IEEE Signal Processing Letters, vol 27, pp. 1225-1229, 2020.

[J5] **H. Qiao** and P. Pal, ``Guaranteed Localization of More Sources than Sensors with Finite Snapshots in Multiple Measurement Vector Models Using Difference Co-Arrays", IEEE Transactions on Signal Processing, vol. 67, no. 22, pp. 5715-5729, Nov. 2019.
[J4] Ali KoochakZadeh, **H. Qiao** and P. Pal, ``On Fundamental Limits of Joint Sparse Support Recovery Using Certain Correlation Priors", IEEE Transactions on Signal Processing, vol. 66, no. 17, pp. 4612-4625, Sep. 2018.
[J3] **H. Qiao** and P. Pal, ``Gridless Line Spectrum Estimation and Low-Rank Toeplitz Matrix Compression Using Structured Samplers: A Regularization-Free Approach", IEEE Transactions on Signal Processing, vol. 65, no. 9, pp. 2211-2226, May 2017.
[J2] **H. Qiao** and P. Pal, ``On Maximum Likelihood Methods for Localizing More Sources than Sensors", IEEE Signal Processing Letters, vol. 24, no. 5, pp. 703-706, May 2017.
[J1] **H. Qiao** and P. Pal, ``Generalized Nested Sampling for Compressing Low Rank Toeplitz Matrices", IEEE Signal Processing Letters, vol. 22, no. 11, pp. 1844-1848, Nov. 2015.

Conferences

[C18] X. Mao and **H. Qiao**, ``On Super-Resolution with Separation Prior ", in the Proceedings of 48th International Conference on Acoustics, Speech and Signal Processing (ICASSP), Rhodes Island, Greece, June 2023.
[C17] H. Yu and **H. Qiao**, ``Exact Sparse Super-Resolution via Model Aggregation", in the Proceedings of 47th International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, May 2022.
[C16] W. Lu and **H. Qiao**, ``On Overfitting in Discrete Super-Resolution Recovery", in the Proceedings of 46th International Conference on Acoustics, Speech and Signal Processing (ICASSP), Toronto, Canada, June 2021.
[C15] **H. Qiao**, P. Sarangi, Y. Alnumay and P. Pal, ``Sample Complexity Trade-Offs for Synthetic Aperture based High-Resolution Estimation and Detection", in the Proceedings of 11th IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), Hangzhou, China, June 2020. **[Nominated for Best Student Paper Award Competition]**
[C14] **H. Qiao**, S. Shahsavari and P. Pal, ``Super-Resolution with Noisy Measurements: Reconciling Upper and Lower Bounds", in the Proceedings of 45th International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, May 2020.
[C13] **H. Qiao** and P. Pal, ``A Non-Convex Approach to Non-Negative Super-Resolution: Theory and Algorithm", in the Proceedings of 44th International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, UK, May 2019.
[C12] **H. Qiao,** M. C. Hucumenoglu and P. Pal, ``Compressive Kriging Using Multi-Dimensional Generalized Nested Sampling", in the Proceedings of Asilomar Conference on Signals, Systems and Computers, 2018.
[C11] **H. Qiao** and P. Pal, `` On modulus of continuity for noisy positive super-resolution", in the Proceedings of 43nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2018), Calgary, Canada.

[C10] **H. Qiao** and P. Pal, ``Understanding the Role of Positive Constraints in Sparse Bilinear Problems", in the Proceedings of 7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Dec. 2017**. [Nominated for Best Student Paper Award Competition]**

[C9] P. Sarangi, **H. Qiao** and P. Pal, "On the Role of Sampling and Sparsity in Phase Retrieval for Optical Coherence Tomography", in the Proceedings of 7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Dec. 2017.

[C8] **H. Qiao** and P. Pal, ``Performance Limits of Covariance-Driven Super Resolution Imaging", in the Proceedings of Asilomar Conference on Signals, Systems and Computers, 2017.

[C7] **H. Qiao** and P. Pal, ``Multiple Hypothesis Testing for Dynamic Support Recovery," in the Proceedings of 18th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), 2017.

[C6] **H. Qiao** and P. Pal, ``Unified Analysis of Co-Array Interpolation for Direction-of-Arrival Estimation," in the Proceedings of 42nd International Conference on Acoustics, Speech and Signal Processing (ICASSP), New Orleans, March 2017.

[Best Student Paper Award, First Place]

[C5] **H. Qiao** and P. Pal, ``Stable Compressive Low Rank Toeplitz Covariance Estimation Without Regularization", in the Proceedings of Asilomar Conference on Signals, Systems and Computers, 2016.

[C4] **H. Qiao** and P. Pal, ``Finite Sample Analysis Covariance Compression Using Structured Samplers,'' in the Proceedings of 9th IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), Rio de Janeiro, Brazil, 2016.

[C3] **H. Qiao** and P. Pal, `` Sparse Phase Retrieval with Near Minimal Measurements: A Structured Sampling Based Approach", in the Proceedings of 41st IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Shanghai, China, 2016.

[C2] **H. Qiao** and P. Pal, ``Sparse Phase Retrieval Using Partial Nested Fourier Samplers,'' in the Proceedings of IEEE Global Conference on Signal and Information Processing (GlobalSIP), Orlando, FL, USA, 2015.

[C1] **H. Qiao** and P. Pal, ``Generalized Nested Sampling for Compression and Exact Recovery of Symmetric Toeplitz Matrix,'' in the Proceedings of IEEE Global Conference on Signal and Information Processing (GlobalSIP), Atlanta, GA, USA, 2014.