

## 刘宏清

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### 教育背景

- (2006-2009) 博士, 香港城市大学, 电子工程系
- (2003-2006) 硕士, 西安电子科技大学, 电子工程系
- (1999-2003) 学士, 西安电子科技大学, 电子工程系

### 研究方向

- 阵列流型设计, 阵列信号处理
- 参数估计, 统计信号处理
- 传感器网络中的目标跟踪
- 压缩感知
- 凸优化
- 水声信号处理, 成像, 定位
- 语音信号处理, 智能音频信号处理

### 奖励

- 西安电子科技大学优秀本科毕业生, 2003
- 西安电子科技大学学术年会最优论文, 2005
- 陕西省优秀硕士毕业生, 2006
- 西安电子科技大学优秀硕士论文, 2006
- 陕西省高等学校科学技术奖, 一等, 2006, 编号: No. 06C18.
- 陕西省科技进步奖, 二等, 2007, 编号: No. 06-2-010-R9.
- 最优论文, IEEE DSP, 2016
- 多元供给、自主选择、形成性评价的个性化实践教学模式改革与实践, 重庆市教学成果奖励, 三等奖, 2022.
- 第八届中国国际互联网+创新创业大赛, 优秀创新创业导师, 重庆市教育委员会, 2022.
- mdctGAN: Taming transformer-based GAN for speech super-resolution with Modified DCT spectra, 重庆市优秀本科毕业论文, 2023.
- 第三届成渝地区双城经济圈留学生创新创业大赛, 优秀指导教师, 重庆市教育委员会, 四川省教育厅, 2023.

## 竞赛获奖

- 全国银奖, The intelligent wheelchair based on GIS and MIC array speech recognition, 第五届中国国际“互联网+”大学生创新创业大赛, 2019.
- Global Top 10, Beamforming Videos Contest, ICASSP, Spain, 2020.
- 全国铜奖, “Timbre” - 一款基于计算机听觉技术的智能安全监测机器人, 第七届中国国际“互联网+”大学生创新创业大赛, 2021.
- 全国银奖, Windblade listener - an intelligent approach for wind turbine blade monitoring using sound, 第七届中国国际“互联网+”大学生创新创业大赛, 2021.
- L3DAS22: Machine Learning for 3D Audio Signal Processing - 3D Sound Event Localization and Detection, second place, ICASSP, 新加坡, 2022.
- Robust Anomaly Sound Detection Framework for Machine Condition Monitoring, DCASE (声事件检测全球比赛) Task 2, 全球第一名, 2022.
- 重庆市金奖, 踏铁寻声, 第八届中国国际“互联网+”大学生创新创业大赛, 重庆, 2022.
- Attention mechanism network and data augmentation for sound event localization and detection, DCASE Task 3.A, 全球第二名, 2023.
- Audio-visual sound event localization and detection based on CRNN using depth-wise separable convolution, DCASE Task 3.B, 全球第二名, 2023.
- 第三届成渝地区双城经济圈留学生创新创业大赛, 二等奖, 重庆市教育委员会, 四川省教育厅, 2023.
- Power cue enhanced network and audio-visual fusion for sound event localization and detection of DCASE2024 Challenge, DCASE Task 3.A&B, Fourth place, 2024.

## 工作经历

- 研究员 (2009.10 - 2013.01), Acoustic Research Laboratory, Tropical Marine Science Institute, Electrical and Computer Engineering Department, National University of Singapore (新加坡国立大学).
- 教授 (2013.02 - ), 通信与信息工程学院, 重庆邮电大学.
- 高级学术导师 (2018. 09-), 联合办学, 重庆邮电大学和伦敦布鲁内尔大学.

## 教学

1. 本科生课程
  - ◇ 信号与系统(中文和英文)
  - ◇ 数字信号处理(英文)
2. 研究生课程
  - ◇ 现代信号处理(中文和英文)
3. 留学生研究生
  - ◇ 现代信号处理(英文)

## 文章

## Journal papers

1. 刘宏清,谢奇洲, 赵宇, 周翊, 基于扩张卷积和Transformer的视听融合语音分离方法, 信号处理, Mar. 2024.
2. X. Kang, J. Wan, D. Li, Q. Liu, **H. Q. Liu**, R. Hu, Z. Chen, Spaceborne Distributed Aperture Radar Maneuvering Target Detection Approach with Space-Time 2D Hybrid Integration Technique, *Signal Processing*, Dec. 2023.
3. A. Ashurov, Z. Yi, **H. Q. Liu**, Z. Yu, and M. Li, Concatenation-based pre-trained convolutional neural networks using attention mechanism for environmental sound classification, *Applied Acoustics*, Vol. 216, Jan. 2024.
4. Y. Liu, **H. Q. Liu**, Y. Zhao, Y. Zhou, A Novel Earprint: Stimulus-Frequency Otoacoustic Emission for Biometric Recognition, *IEEE Transactions on Information Forensics & Security*, accepted.
5. Q. Liu, D. Li, R. Jiang, S. Liu, **H. Q. Liu**, S. Li, MT-FANet: A Morphology and Topology-based Feature Alignment Network for SAR Ship Rotation Detection, *Remote Sensing*, accepted.
6. J. Wan, X. Kang, X. Tan, D. Li, Z. Chen, **H. Q. Liu**, An Efficient Approach for Coherent Integration Detection of High-speed Maneuvering Targets with Arbitrary-Order Doppler Frequency Migrations, *IEEE Transactions on Aerospace and Electronic Systems*, accepted.
7. **H. Q. Liu**, W. Zhu, Y. Zhou, L. Shi, L. Gan, Nonintrusive wind blade fault detection using deep learning approach by exploring acoustic information, *The Journal of the Acoustical Society of America*, 153, 538-547, 2023.
8. S. Liu, **H. Q. Liu**, Simultaneous non-convex low rank regularization for fast magnetic resonance spectroscopy reconstruction, *Digital Signal Processing*, accepted.
9. J. Wan, Z. He, X. Tan, D. Li, **H. Q. Liu**, Y. Shu, and Z. Chen, Coherent Integration for Maneuvering Target Detection via Fast Nonparametric Estimation Method, *Signal Processing*, accepted.
10. Z. Luo, T. Liu, Y. Xiang, and **H. Q. Liu**, Robust Hybrid Beamforming in Full-Duplex Broadband mmWave Relay Systems, *Digital Signal Processing*, accepted (**Corresponding author**).
11. A. Ashurov, Y. Zhou, L. Shi, Y. Zhao, and **H. Q. Liu**, Environmental sound classification based on transfer learning techniques with multiple optimizers, *Electronics*, accepted.
12. Y. Shu, J. Wan, D. Li, Z. Chen and **H. Q. Liu**, Fast Approach for SAR Imaging of Ground Moving Target Based on Range Azimuth Joint Processing, *Remote Sensing*, Jul. 2022.

13. R. Liu, Y. Zhou, **H. Q. Liu**, X. Xu, J. Jia, and B. Chen, A New Neural Beam-former for Multi-channel Speech Separation, *Journal of Signal Processing Systems*, accepted.
14. S. Berthe, X. Jing, **H. Q. Liu**, and Q. Chen, Low-complexity soft-output signal detector based on adaptive pre-conditioned gradient descent method for up-link multiuser massive MIMO systems, *Digital Communications and Networks*, accepted.
15. Z. Luo, L. Zhao, **H.Q. Liu**, MmWave Relay Systems with Robust Hybrid Transceiver Designs Under Correlated Channel Estimation Errors, *Digital Signal Processing*, accepted.
16. Jian Pang, Hongcheng Li, Tao Jiang, Hui Wang, Xiangning Liao, Le Luo, and **H.Q. Liu**, A Dual-Channel End-to-End Speech Enhancement Method Using Complex Operations in the Time Domain, *Applied Sciences*, 13(13), 2023.
17. D. Li, J. Ren, **H.Q. Liu**, Z. Yang, J. Wan, and Z. Chen, A Novel ISAR Imaging Approach for Maneuvering Targets with Satellite-borne Platform, *IEEE Geoscience and Remote Sensing Letters*, vol. 19, pp. 1-8, 2022.
18. Z. Yang, D. Li, **H.Q. Liu**, G. Liao, An Efficient ISAR Imaging Approach for Highly Maneuvering Targets Based on Subarray Averaging and Image Entropy, *IEEE Trans. Geoscience and Remote Sensing*, 2022.
19. T. Yang, S. Liu, and **H.Q. Liu**, Stochastic Resonance Benefits in Signal Detection under MAP Criterion, *Communications in Nonlinear Science and Numerical Simulation*, accepted.
20. Z. Yang, D. Li, X. Tan, **H.Q. Liu**, Y. Liu, G. Liao, ISAR Imaging for Maneuvering Targets with Complex Motion based on Generalized Radon-Fourier Transform and Gradient-based Descent under Low SNR, *Remote Sensing*, accepted.
21. J. Cao, S. Liu, **H.Q. Liu**, and K. Zhang, MRI reconstruction based on Bayesian group sparse representation, *Signal Processing*, accepted.
22. X. Jing, H. Li, **H.Q. Liu**, and Q. Chen, Precoder and Combiner Design for Dynamically Sub-Connected Hybrid Architecture with Low-Resolution DACs/ ADCs in mmWave Massive MIMO Systems, *SCIENCE CHINA Information Sciences*, 2022, 65: 119301.
23. Dong Li, Quanhuan Liang, **H.Q. Liu**, Qinghua Liu, Haijun Liu, and Guisheng Liao, A Novel Multi-Dimensional Domain Deep Learning Network for SAR Ship Detection, *IEEE Trans. Geoscience and Remote Sensing*, vol. 60, pp. 1-13, 2022. **(ESI paper)**.
24. Y. Zhou, C. Huang, **H.Q. Liu**, D. Li, Trieu-Kien Truong, Front wall clutter removal in through-the-wall radar based on weighted nuclear norm minimization, *IEEE Geoscience and Remote Sensing Letters*, vol. 19, pp. 1-5, 2022. **(Corresponding author)**.

25. S. Liu, J. Cao, **H.Q. Liu**, and K. Zhang, MRI reconstruction based on Bayesian piecewise sparsity constraint and adaptive 3D transform, *Knowledge-Based Systems*, vol. 232, Nov. 2021.
26. Y. Gong, L. Gan, **H.Q. Liu**, Multi-Channel Modulo Samplers Constructed from Gaussian Integers, *IEEE Signal Processing Letters*, vol. 28, pp. 1828-1832, 2021.
27. Z. Luo, L. Zhao, T. Li, **H.Q. Liu**, and R. Zhang, Robust Hybrid Precoding/Combining Designs for Full-Duplex Millimeter Wave Relay Systems, *IEEE Trans. on Vehicular Technology*, vol. 70, iss.99, pp. 9577-9582, Sept. 2021. (**Corresponding author**).
28. Y. Zhou, H. Wang, Y. Chu, and **H.Q.Liu**, A Robust Dual-Microphone Generalized Sidelobe Canceller Using a Bone-Conduction Sensor for Speech Enhancement, *Sensors*, 21(5), Mar. 2021.
29. Z. Luo, L. Zhao, **H.Q.Liu**, Y .Li, Robust Hybrid Beamforming in Millimeter Wave Systems With Closed-form Least-square Solutions, *IEEE Wireless Communications Letters*, vol. 10, iss. 1, pp. 156-160, Jan. 2021.
30. X. Jing, J. Wen, and **H.Q.Liu**, Low-Complexity Soft-Output Signal Detector for Massive MIMO with Higher Order QAM Constellations, *Digital Signal Processing*, vol. 108, Jan. 2021.
31. 李帅, 刘宏清, 彭鹏, 罗臻, 周翊, Underdetermined Blind Source Separation based on Convolution Model in Reverberant Environment-混响环境下基于卷积模型的欠定盲源分离. 信号处理, 2021, 37(04): 624-632.
32. **H.Q.Liu**, H. Meng, L. Gan, D. Li, Y. Zhou, and T.-K.Truong, Subspace and Sparse Reconstruction based Near-field Sources Localization in Uniform Linear Array, *Digital Signal Processing*, vol. 106, Nov. 2020.
33. Y. Zhou, Y. Chen, Y. Ma, and **H.Q.Liu**, A Real-Time Dual-Microphone Speech Enhancement Algorithm Assisted by Bone Conduction Sensor, *Sensors*, 20(18), Sept., 2020 (**Corresponding author**).
34. Z. Yang, D. Li, X. Tan, **H.Q.Liu**, G. Liao, A Fast Bistatic ISAR Imaging Approach for Rapidly Spinning Targets via Exploiting SAR Technique, *Remote Sensing*, 12(13), Jun., 2020.
35. X. Luo, L. Guo, D. Li, **H.Q.Liu**, M. Qin, A Novel 2-D Geometry Reconstruction Approach for Space Debris via Interpolation-Free Operation under Low SNR Conditions, *Remote Sensing*, 12(13), Jun., 2020.
36. D. Li, H. Ma, **H.Q.Liu**, Z. Chen, J. Su, X. Zhou, and Z. Yang, An efficient ground maneuvering target refocusing method based on principal component analysis and motion parameter estimation, *Remote Sensing*, 12(3), Jan. 2020.
37. X. Shu, Y. Zhou, **H.Q.Liu**, and Trieu-Kien Truong, A human auditory perception loss function using modified bark spectral distortion for speech enhancement, *Neural Processing Letters*, 51, pp. 2945-2957, 2020.

38. J. Cao, S. Liu, **H.Q.Liu**, and H. Lu, CS-MRI reconstruction based on analysis dictionary learning and manifold structure regularization, *Neural Networks*, vol. 123, pp. 217-233, Mar. 2020.
39. L. Li, L. Yan, L. Zhou, D. Li, and **H.Q.Liu**,  $\ell_p$ -norm regularization optimization of impulsive disturbance removal, *Journal of Xidian University*, vol. 44 (2): 165-170, 2020. (In Chinese:  $\ell_p$  范数约束的去冲击干扰优化算法)
40. X. Tan, Z. Yang, D. Li, **H.Q.Liu**, G. Liao, Y. Wu, and Y. Liu, An efficient range-Doppler domain ISAR imaging approach for rapidly spinning targets, *IEEE Trans. Geoscience and Remote Sensing*, vol. 58, iss. 4, pp. 2670-2681, Apr. 2020.
41. **H.Q.Liu**, C. Huang, L. Gan, Y. Zhou, and Trieu-Kien Truong, Clutter reduction and target tracking in through-the-wall radar, *IEEE Trans. Geoscience and Remote Sensing*, vol. 58, iss. 1, pp. 486-499, Jan. 2020.
42. C. Zeng, D. Li, X. Luo, D. Song, **H.Q.Liu**, and J. Su, Ground maneuvering targets imaging for synthetic aperture radar based on second-order Keystone transform and high-order motion parameter estimation, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 12, iss. 11, pp. 4486-4501, Nov., 2019.
43. L. Li, L. Yan, D. Li, **H.Q.Liu**, and C. Zhang, A Novel ISAR Imaging Method for Maneuvering Target Based on AM-QFM Model under Low SNR Environment, *IEEE Access*, vol. 7, 2019.
44. C. Huang, **H.Q.Liu**, Z. Luo and Y. Zhou, A mitigating clutter method with joint low-rank and sparse model, *Journal of Xidian University*, vol. 44 (2): 165-170, 2019 . (In Chinese: 一种低秩联合稀疏模型下的杂波抑制方法)
45. D. Li, C. Zhang, H. Ma, **H.Q.Liu**, J. Su, Q. Liu, An Efficient SAR Ground Moving Target Refocusing Method Based on PPFFT and Coherently Integrated CPF, *IEEE Access*, vol. 7, pp. 114102-114115, Dec. 2019.
46. D. Xue, X. Jing, and **H.Q.Liu**, Detection of false data injection attacks in smart grid utilizing ELM-based OCON framework, *IEEE Access*, vol. 7, iss. 1, pp. 31762-31773, Dec. 2019.
47. **H.Q.Liu**, L. Hou, Z. Luo, Y. Zhou, X. Jing, and Trieu-Kien Truong, Image recovery with data missing in the presence of salt-and-pepper noise, *Applied Sciences*, vol. 9, no. 7, Apr. 2019. (invited).
48. J. Cao, S. Liu, **H.Q.Liu**, X. Tan, and X. Zhou, Sparse representation of classified patches for CS-MRI reconstruction, *Neurocomputing*, vol. 339, pp. 255 - 269, 2019.
49. D. Li, C. Zhang, **H.Q.Liu**, J. Su, X. Tan, Q. Liu, and Guisheng Liao, A fast cross-range scaling algorithm for ISAR images based on the 2D discrete wavelet transform and pseudopolar fourier transform, *IEEE Trans. Geoscience and Remote Sensing*, vol. 57, no. 7, pp. 4231-4245, Jul. 2019. (Corresponding author).

50. Y. Li, X. Huang, J. He, **H.Q.Liu**, and Trieu-Kien Truong, On soft-information-based error and erasure decoding of Reed-Solomon codes in burst Rayleigh fading channels, *IEEE Trans. on Communications*, vol. 67, iss. 1, pp. 50-60, Jan. 2019.
51. X. Wu, Y. Li and **H.Q.Liu**, LDPC编码的MIMO-OFDM系统中的联合半盲均衡与解码研究, *系统工程与电子技术*, vol. 40, iss. 8, pp. 1866-1872, 2018.
52. X. Jing, H. Li, **H.Q.Liu**, and S. Li, Dynamically-Connected Hybrid Precoding Scheme for Millimeter Wave Massive MIMO Systems, *IEEE Communications Letters*, vol. 22, iss. 12, pp. 2583-2586, Dec. 2018.
53. X. Jing, L. Wan, **H.Q.Liu**, S. Li, and G. Pan, Superimposed pilot optimization design and channel estimation for multiuser massive MIMO systems, *IEEE Trans. on Vehicular Technology*, vol. 67, iss. 12, pp. 11818-11832, Dec. 2018.
54. Cao Zeng, Mengyi Qin, Dong Li, **H.Q.Liu**, Yi Chai, An Efficient ISAR Imaging of Targets with Complex Motions Based on a Quasi-Time-Frequency Analysis Bilinear Coherent Algorithm, *Sensors*, 2018, 18(9), 2814.
55. X. Zhang, Z. Tan, G. Liu, **H.Q.Liu**, Y. Wang, S. Liu, Y. Li, H. Xu, and J. Xia, Adaptive Local Aspect Dictionary Pair Learning Based SAR Target Images Classification, *Sensors*, 2018, 18(9), 2940.
56. Z. Luo, **H.Q.Liu**, Y. Li, H. Wang, and L. Zhang, Robust Hybrid Transceiver Design for AF Relaying in Millimeter Wave Systems under Imperfect CSI, *IEEE Access*, vol. 6, pp. 29739-29746, Dec. 2018.
57. **H.Q.Liu**, Y. Li, Y. Zhou, X. Jing, and Trieu-Kien Truong, Joint Power Line Interference Suppression and ECG Signal Recovery in Transform Domains, *Biomedical Signal Processing and Control*, vol. 44, pp. 58-66, Jul. 2018.
58. **H.Q.Liu**, D. Li, Y. Zhou, and Trieu-Kien Truong, Simultaneous Radio Frequency and Wideband Interference Suppression in SAR Signals via Sparsity Exploitation in Time-Frequency Domain, *IEEE Trans. Geoscience and Remote Sensing*, vol. 56, iss. 10, pp. 5780-5793, Oct. 2018.
59. S. Liu, J. Cao, **H.Q.Liu**, X. Tan, and X. Zhou, Group sparsity with orthogonal dictionary and nonconvex regularization for exact MRI reconstruction, *Information Sciences*, vol. 451-452, pp. 161-179, Jul. 2018.
60. Y. Li, Y. Duan, H.-C. Chang, **H.Q.Liu**, and Trieu-Kien Truong, Using the difference of syndromes to decode quadratic residue codes, *IEEE Trans. Information Theory*, vol. 64, iss. 7, pp. 5179-5190, Jul. 2018.
61. T.-C. Lin, L. Hou, **H.Q.Liu**, Y. Li, and Trieu-Kien Truong, Reconstruction of single image from multiple blurry measured images, *IEEE Trans. Image Processing*, vol. 27, iss. 6, pp. 2762-2776, Jun. 2018. (**Corresponding author**) (**Top 25 downloaded articles in 2020 on IEEE Xplore**).



62. S. Liu, J. Cao, G. Wu, **H.Q.Liu**, X. Tan, and X. Zhou, CS-MRI reconstruction via group-based eigenvalue decomposition and estimation, *Neurocomputing*, vol. 283, pp. 166-180, Mar. 2018.
63. X. Jing, L. Mo, **H.Q.Liu**, and C. Zhang, Linear Space-Time Interference Alignment for  $K$ -user MIMO Interference Channels, *IEEE Access*, vol. 6, pp. 3085-3095, 2018.
64. T. Yang, Shujun Liu, **H.Q.Liu**, M. Tang, X. Tan, and X. Zhou, Noise Benefits Parameter Estimation in LMMSE Sense, *Digital Signal Processing*, vol. 73, pp. 153-163, Feb. 2018.
65. **H.Q.Liu**, RuiBo Zhang, Yi Zhou, Xiaorong Jing, and Trieu-Kien Truong, Speech denoising using Transform Domains in the Presence of Impulsive and Gaussian Noises, *IEEE Access*, vol. 5, iss. 1, pp. 21193 -21203, Dec., 2017.
66. Dong Li, Muiyang Zhan, Jia Su, **H.Q.Liu**, Xuepan Zhang, and Guisheng Liao, Performances Analysis of Coherently Integrated Cubic Phase Function for LFM Signal and Its Application to Ground Moving Target Imaging, *IEEE Trans. Geoscience and Remote Sensing*, vol. 55, no. 11, pp. 6402-6419, Nov., 2017.
67. Shujun Liu, Ting Yang, **H.Q.Liu**, Optimal Detection under the Restricted Bayesian Criterion, *Entropy*, 19(7), 370, 2017. (**Corresponding author**).
68. **H.Q.Liu**, D. Li, Y. Zhou and T.-K. Truong, Joint Wideband Interference Suppression and SAR Signal Recovery based on Sparse Representations, *IEEE Geoscience and Remote Sensing Letters*, vol. 14, no. 9, pp. 1542-1546, Sep. 2017.
69. X. Jing, A. Li, **H.Q.Liu**, A Low-Complexity Lanczos-Algorithm-Based Detector with Soft-Output for Multiuser Massive MIMO Systems, *Digital Signal Processing*, vol. 69, pp. 41-49, Oct. 2017.
70. Shujun Liu, Jianxin Cao, **H.Q.Liu**, Xichuan Zhou, Kui Zhang, and Zhengzhou Li, MRI reconstruction via enhanced group sparsity and nonconvex regularization, *Neurocomputing*, vol. 272, pp. 108-121, Jan. 2018.
71. Shujun Liu, Jianxin Cao, **H.Q.Liu**, Xiaodong Shen, Kui Zhang, and Pin Wang, MRI Reconstruction Using a Joint Constraint in Patch-Based Total Variational Framework, *Journal of Visual Communication and Image Representation*, vol.46, pp. 150-164, Jul. 2017.
72. D. Li, M. Zhan, **H.Q.Liu**, G. S. Liao and Y. Liao, A Translational Motion Compensation Method for ISAR Imaging Based on Keystone Transform and Fractional Fourier Transform under Low SNR Environment, *IEEE Trans. Aerospace and Electronic Systems*, vol. 53, iss. 5, pp. 2140-2156, Oct. 2017.
73. X. Jing, M. Wang, W. Zhou and **H.Q.Liu**, Improved QRD-M Detection Algorithm for Generalized Spatial Modulation Scheme, *International Journal of Antennas and Propagation*, vol.2017 (2017), Article ID 3581592.



74. D. Li, **H.Q.Liu**, Muyang Zhan, Xinzheng Zhang and Zhiping Fang, ISAR Imaging of Nonuniformly Rotating Target Based on the Multi-Component CPS Model under Low SNR Environment, *IEEE Trans. Aerospace and Electronic Systems*, vol. 53, iss. 3, pp. 1119-1135, 2017.
75. W. Yang, **H.Q.Liu**, Y. Li and Y. Zhou, Joint estimation algorithms based on LMS and RLS in the presence of impulsive noise, *Journal of Xidian University*, vol. 44 (2): 165-170, 2017 . (In Chinese: 冲击噪声下的LMS和RLS联合滤波算法, 20172103687750)
76. Shujun Liu, Guoqing Wu, **H.Q.Liu**, Xinzheng Zhang, Image restoration using joint sparse representation in 3D-transform domain, *Digital Signal Processing*, vol. 60, pp. 307-323, Jan. 2017.
77. Shujun Liu, Ting Yang, Mingchun Tang, **H.Q.Liu**, Kui Zhang and Xinzheng Zhang, Optimal noise benefit in composite hypothesis testing under different criteria, *Entropy*, 2016, 18(8).
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79. **H.Q.Liu**, L. Zhao, Y. Li, X. R. Jing and T.-K. Truong, A sparse based approach for DOA estimation and array calibration in uniform linear array, *IEEE Sensors Journal*, vol. 16, iss. 15, pp. 6018 - 6027, Aug. 2016.
80. D. Li, W. Wang, **H.Q.Liu**, H. Cao and H. Lin, Focusing highly squinted azimuth variant bistatic SAR, *IEEE Trans. Aerospace and Electronic Systems*, vol. 52, no. 6, pp. 2715-2730, Dec. 2016.
81. D. Li, H. Lin, **H.Q.Liu**, G. Liao and X. Tan, Focus improvement for high-resolution highly squinted SAR imaging based on 2-D spatial-variant linear and quadratic RCMs correction and azimuth-dependent doppler equalization, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol.10, iss.1, pp.168-183, Jan., 2017.
82. X. Jing, X. Liu and **H.Q.Liu**, A sparse recovery method for DOA estimation based on the sample covariance vectors, *Circuits, Systems and Signal Processing*, pp.1-19, May, 2016.
83. D.Li, X.Gui, **H.Q.Liu**, J.Su and H.Xiong, An ISAR imaging algorithm for maneuvering targets with low SNR based on parameter estimation of multi-component quadratic FM signals and nonuniform FFT, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol.9, iss.12, pp.5688-5702, Dec. 2016.
84. D. Li, H. Lin, **H.Q.Liu** and H. Wu, Focus improvement for squint FMCW-SAR data using modified inverse Chirp-Z transform based on spatial-variant linear range cell migration correction and series inversion, *IEEE Sensors Journal*, vol.16, iss. 8, pp.2564-2574, Apr. 2016.

85. **H.Q.Liu**, L. Zhao, D. Ding, Y. Li and Y. Zhou, A study on off-grid issue in DOA and frequency estimations, *Multidimensional Systems and Signal Processing*, vol. 28, iss. 2, pp 735 – 755, Apr. 2017.
86. D. Li, **H.Q.Liu**, X. Gui and X. Zhang, An efficient ISAR imaging method for maneuvering target based on synchrosqueezing transform, *IEEE Antennas and Wireless Propagation Letters*, vol. 15, pp.1317-1320, 2016.
87. **H.Q.Liu** and D. Li, RFI suppression based on sparse frequency estimation for SAR imaging, *IEEE Geoscience and Remote Sensing Letters*, vol.13, no.1, pp.63-67, Jan. 2016.
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2. C. Shi, K. Huang, L. Gan, **H.Q.Liu**, M. Zhu, N.Wang, and X. Gao, On the Analysis of GAN-based Image-to-Image Translation with Gaussian Noise Injection, International Conference on Learning Representations (ICLR), Vienna, Austria, May 2024.
3. W. Yan, L. Gan, S. Hu, and **H.Q.Liu**, Towards optimized multi-channel modulo-ADCS: moduli selection strategies and bit depth analysis, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul Korea, Apr., 2024.
4. K. Huang, C. Shi, L. Gan, and **H.Q.Liu**, Understanding Gaussian Noise Mismatch: A Hellinger Distance Approach, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul Korea, Apr., 2024.
5. L. Wan, **H.Q.Liu**, Multi-Loss Convolutional Network with Time-Frequency Attention for Speech Enhancement, International Conference on Information Communication and Signal Processing, Xi'an, China, Sept., 2023. (**Best presentation award**).
6. Y. Wang, **H.Q.Liu**, Audio-Visual Sound Event Localization and Detection based on CRNN using Depth-wise Separable Convolution, 18th EAI International Conference on Communications and Networking in China (Chinacom), Sanya, China, Nov. 2023.
7. L. Jiang, **H.Q.Liu**, A Neural Network Assisted FuLMS Algorithm for Active Noise Control System, 18th EAI International Conference on Communications and Networking in China (Chinacom), Sanya, China, Nov. 2023.
8. S. Chen, **H.Q.Liu**, Multi-Scale and Coordinate Attention Residual Network for Efficient Keyword Spotting, 18th EAI International Conference on Communications and Networking in China (Chinacom), Sanya, China, Nov. 2023.
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14. Z. Hu, **H.Q.Liu**, Robust Hybrid Beamforming for Full-Duplex OFDM mmWave Systems With Partially-connected Structure, 17th EAI International Conference on Communications and Networking in China (Chinacom), Virtual conference, Nov. 2022.
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## 项目

1. Robust positioning in Wireless Sensor Network. The Key Laboratory of Intelligent Robot in Hubei Province. HBIR 201001, 01/2011-01/2012. (PI)
2. 稀疏信号处理及冲击噪声相消技术研究,重庆市科委,cstc2014jcyjA40017,2014.07-2017.06. (PI)
3. 压缩感知算法在频率估计中的应用,教育部留学回国基金, F201405, 2014.9.23-2016.12.31. (PI)
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7. 面向移动高清视频传输的广义LDPC码性能研究与优化设计, 国家自然科学基金, 61771081, 2018.1-2022.12. (参与)
8. LDPC编码的MIMO-OFDM系统的联合半盲均衡与解码研究, 重庆市科委, cstc2014jcyjA40027, 2014.7-2017.6. (参与)
9. 新型调制编码技术研究开发, 国家科技部863计划项目子项目. (参与)
10. X线阵列仿真, 横向
11. 人工智能信号处理模型推理工业化, 横向
12. 实时智能降噪算法系统实现, 横向
13. 电动汽车低速提示音系统设计及算法研究, 横向
14. 旋翼调制下AM话音的干扰抑制及增强软件, 横向

#### 会议组织

- Technical Program Committee (TPC) member, IEEE International Conference on Signal Processing, Communications and Computing, 2013
- TPC member, 11th EAI International Conference on Communications and Networking in China (Chinacom), 2016
- Committees member, International Conference on Communications, Signal Processing, and Systems (CSPS), 2016
- TPC member, IEEE 85th Vehicular Technology Conference, 2017
- Track chair, International Conference on Mobile Multimedia Communications, 2017

#### 专利

- 黎勇, 刘宏清, 李鹏华. 一种73平方剩余码的线性规划译码方法, 国家发明专利, 申请号: 201410177335.0, 已公开.
- 刘宏清, 黎勇, 赵陆明, 一种阵列误差下的波达方向估计方法, 国家发明专利, 授权号: 201510315734.3
- 刘宏清, 黎勇, 丁东艳, 冲击噪声且带有数据丢失的信号的频率估计方法, 国家发明专利, 授权号: 201510315764.4
- 刘宏清, 杨威, 黎勇, 周翊, 一种冲击噪声下的自适应联合滤波算法, 国家发明专利, 授权号: 201610569440.8
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