Wenqiang PU | Sig Proc., Opt., ML

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Basic Information

Gender: Male

Date of Birth: Jan. 26, 1991

Position: Research Scientist, Shenzhen Research Institute of Big Data

Other Position: Adjunct Assistant Professor, The Chinese University of Hong Kong (Shenzhen)

Research Interests

Signal Processing
Signal Processing, Distributed SP, Multi-sensor Data Fusion

Optimization
Convex Relaxation, First-order Optimization, Primal-Dual Method

Machine Learning
Reinforcement/Online Learning/LLM for SP

Research Funding

NSFC-General Program **500,000 RMB**
PI, Decision Methods for Cognitive Signal Sensing *Jan. 2025 – Dec. 2028*

National Key R&D Program of China **800,000 RMB**
Co-PI, Black Box Optimization Methods and Theory *Dec 2024 – Dec 2027*

Xidian Univ.-Contracted Research Project **300,000 RMB**
PI, Intelligent Anti-jamming Method *July 2024 – July 2025*

CETC-Industry-funded Project **2,000,000 RMB**
PI, Theory and Method for Collaborative Sensing *Sep. 2023 – June 2024*

NSFC-Young Scientists Fund **300,000 RMB**
PI, Optimization Methods for Phased Array Beamforming *Jan. 2022 – Dec. 2024*

CETC-Industry-funded Project **12,000,000 RMB**
Co-PI, Multi-dimensional Signal Processing: Theory and System *Jan. 2022– Dec. 2024*

Xidian Univ.-Contracted Research Project **600,000 RMB**
PI, Game Theory for Array Signal Processing *July 2020 – July 2022*

Education

Information and Signal Processing **EE, Xidian University**
P.hD., Xi'an, China *Sep. 2013– Dec. 2018*

The Chinese University of Hong Kong (Shenzhen)
Visiting P.hD Student, Shenzhen, China *Jan. 2015–Jun. 2018*

Electronic Engineering **EE, Xidian University**
B.Sc, Xi'an, China *Sep. 2009–Jun. 2013*

Work Experience

School of Science and Engineering **The Chinese University of Hong Kong (Shenzhen)**
Adjunct Assistant Professor, China *Oct. 2024– Present*

Information System Lab **Shenzhen Research Institute of Big Data**
Research Scientist, Shenzhen, China *Oct. 2020– Present*

School of Science and Engineering **The Chinese University of Hong Kong (Shenzhen)**
Postdoc, Shenzhen, China *Jan. 2019–Sep. 2020*

Teaching Experience

Optimization in Signal Processing **Xidian University**
Short Course, China *Sep. 2020*

Digital Signal Processing **Xidian University**
TA, China *Sep. 2017– Dec. 2017*

Academic Activities

Academic Service

Associate Editor *April 2024 – present*
IEEE Signal Processing Letters

Awards and Honors

Top 0.5% Scholar by ScholarGPS *Aug. 2025*
Fields: Signal Processing, Radar, Sensor Fusion

Outstanding Coach Award *Sep. 2024*
The 3rd HUAWEI College Student's Communication Algorithm Competition

Best Student Paper Award *July 2024*
IEEE SAM 2024

Natural Science Award of CIE, First Class *May 2023*
Chinese Institute of Electronics, Shanxi

Excellent Paper Award *Oct. 2016*
2016 CIE International Conference on Radar

Talks

Optimistic Thompson Sampling for No-Regret Learning in Unknown Games
Invited Talk *Aug. 2025*
The 1st Youth Academic Conference, Operations Research Society of China

Anti-jamming Strategy Learning via Online Convex Optimization
Invited Talk *Sep. 2024*
Mathematical Issues in Communications, Tianyuan Mathematics Research Center, China

Stochastic Mirror Descent for Low-Rank Tensor Decomposition
Invited Talk *Aug. 2023*
ICIAM 2023, Tokyo, Japan

Cooperative Sensing via Matrix Factorization of Sample Covariance Matrix
Invited Talk *Aug. 2023*
China Electromagnetic Spectrum Annual Conference 2023, Chengdu, China

Iteration Complexity of Proximal ALM for Nonconvex Optimization
Invited Talk *April 2023*
DINO 2023, Beijing, China

Low-Rank Tensor Decomposition Under Non-Euclidean Losses
Invited Talk *Oct. 2022*
Sichuan University, Chengdu, China

Optimization Technique in Array Signal Processing
Invited Talk *June 2022*
Zhejiang University, Hangzhou, China

Low-Rank Tensor Decomposition Under Non-Euclidean Losses
Invited Talk *Nov. 2021*
CECNet 2021, Online

Notes on Optimization in Signal Processing
Invited Talk *Sep. 2020*
Xidian University, Xian, China

Overcome DoF Limitation in Robust Beamforming
Invited Talk *Oct. 2019*
ICCAIS 2019, Chengdu, China

Conference/Workshop Organization

The 13th International Conference on Elect., Communications and Networks
Session Chair, Macao, China *Dec. 2023*

International Conference on Control, Automation and Information Sciences
Session Chair, Xian, China *Oct. 2021*

2020 International Workshop on Mathematical Issues in Information Science
Session Chair, Shenzhen, China *Dec. 2020*

Reviewers

Conference: IEEE ICASSP, IEEE SAM, IEEE MLSP

Journal: IEEE Transactions on Signal Processing, IEEE Transactions on Aerospace and Electronic Systems, IEEE Information Forensics and Security, IEEE Signal Processing Letter, Journal of Global Optimization, Remote Sensing, Signal Processing

Publication List

Selected Journal Papers

[1] Z. Chen, **W. Pu***, L. Zhao, and Q. Shi*, *Robust Two-Tier Beamforming for Distributed Signal Sensing*. IEEE Transactions on Signal Processing, 2025.

[2] R. Zhou, **W. Pu***, M.-Y. You*, and Q. Shi, *Harnessing Monotonic Neural Networks for Performance Prediction and Threshold Determination in Multichannel Detection*. IEEE Transactions on Signal Processing, 2025.

[3] R. Zhou, **W. Pu***, M.-Y. You, and Q. Shi, *A Robust Cooperative Sensing Approach for Incomplete and Contaminated Data*. IEEE Transactions on Signal Processing, 2024.

[4] Y. Fan, B. Jiu*, **W. Pu***, Z. Li, K. Li, and H. Liu, *Sensing Jamming Strategy from Limited Observations: An Imitation Learning Perspective*. IEEE Transactions on Signal Processing, 2024.

[5] **W. Pu***, Y.-F. Liu, and Z.-Q. Luo, *Efficient estimation of sensor biases for the 3-dimensional asynchronous multi-sensor system*. IEEE Transactions on Signal Processing, 2023.

[6] **W. Pu***, J. Xiao, T. Zhang, and Z.-Q. Luo, *A penalized inequality-constrained approach for robust beamforming with DoF limitation*. Signal Processing, 2023, vol. 202, p. 108 746.

[7] **W. Pu***, S. Ibrahim, X. Fu, and M. Hong, *Stochastic mirror descent for low-rank tensor decomposition under non-Euclidean losses*. IEEE Transactions on Signal Processing, 2022, vol. 70, pp. 1803–1818.

[8] H. Sun, **W. Pu**, X. Fu, T.-H. Chang, and M. Hong*, *Learning to continuously optimize wireless resource in a dynamic environment: A bilevel optimization perspective*. IEEE Transactions on Signal Processing, 2022, vol. 70, pp. 1900–1917.

[9] **W. Pu**, Y.-F. Liu, J. Yan, H. Liu, and Z.-Q. Luo*, *Optimal estimation of sensor biases for asynchronous multi-sensor data fusion*. Mathematical Programming, 2018, vol. 170, pp. 357–386.

[10] J. Yan, **W. Pu***, H. Liu*, B. Jiu, and Z. Bao, *Robust chance constrained power allocation scheme for multiple target localization in colocated MIMO radar system*. IEEE Transactions on Signal Processing, 2018, vol. 66, pp. 3946–3957.

Other Journal Papers

[11] H. Jiao, J. Yan, **W. Pu**, Y. Chen, J. Liang, and H. Liu, "Joint transmission resource allocation and path planning scheme for airborne radar cooperation in non-ideal detection environments", *IEEE Transactions on Aerospace and Electronic Systems*, 2025.

[12] H. Jiao, J. Yan*, **W. Pu***, T. Li, L. Ma, and H. Liu, "Heterogeneous time resource arrangement and refined tracking for phased array radar within complex target environment", *IEEE Transactions on Signal Processing*, 2025.

[13] P. Zhang, J. Yan, **W. Pu**, K. Li, H. Liu, and M. S. Greco, "Learning based transmit resource management scheme for multiple target tracking with active jamming mitigation", *IEEE Transactions on Aerospace and Electronic Systems*, 2025.

[14] L. Zhao, R. Zhou, M.-Y. You, and **W. Pu***, "Can doa algorithms be deceived?", *IEEE Signal Processing Letters*, 2025.

[15] Y. Sun, J. He, Z. Lin, **W. Pu**, F. Yin, and H. C. So, "Hybrid data-driven ssm for interpretable and label-free mmwave channel prediction", *IEEE Transactions on Mobile Computing*, 2025.

[16] L. Zhao, **W. Pu***, R. Zhou, M.-Y. You, and Q. Shi, "Contextual direct position determination for path loss informed localization", *IEEE Signal Processing Letters*, 2025.

[17] M.-Y. You, **W. Pu***, R. Zhou, *et al.*, "Calibration signal assisted emitter localization under sensor position uncertainty", *IEEE Transactions on Aerospace and Electronic Systems*, 2025.

[18] H. Jiao, J. Yan, **W. Pu***, Y. Chen, H. Liu, and M. S. Greco, "Wideband sensor resource allocation for extended target tracking and classification", *IEEE Transactions on Signal Processing*, 2024.

[19] Y. Wu, B. Jiu, **W. Pu**, H. Zheng, K. Li, and H. Liu, "Clutter-sensing-driven space-time adaptive processing approach for airborne sub-array-level digital array", *Remote Sensing*, vol. 16, no. 23, p. 4401, 2024.

[20] R. Zhou, **W. Pu***, L. Zhao, M.-Y. You, Q. Shi, and S. Theodoridis, "A matrix-factorization-error-ratio approach to cooperative sensing in non-ideal communication environment", *IEEE Transactions on Signal Processing*, 2024.

[21] L. Zhao, **W. Pu**, R. Zhou, and Q. Shi, "A third-order majorization algorithm for logistic regression with convergence rate guarantees", *IEEE Signal Processing Letters*, 2024.

[22] L. Zhou, **W. Pu**, Y. Jiang, M.-Y. You, R. Zhang, and Q. Shi*, "Joint optimization of uav deployment and directional antenna orientation for multi-uav cooperative sensing system", *IEEE Transactions on Wireless Communications*, 2024.

[23] P. Zhang, J. Yan*, **W. Pu***, H. Liu, and M. S. Greco, "Multi-dimensional resource management scheme for multiple target tracking under dynamic electromagnetic environment", *IEEE Transactions on Signal Processing*, 2024.

[24] C. Wang, B. Jiu*, **W. Pu**, K. Li*, Y. Zhao, and H. Liu, "Backward and sequential inductions for anti-jamming equilibrium strategy generation of frequency agile radar", *IEEE Transactions on Aerospace and Electronic Systems*, 2024.

[25] J. Dai, J. Yan, **W. Pu**, D. Wang, and H. Liu, "Integrated trajectory planning and resource scheduling for multiple target tracking in airborne radar network", *IEEE Sensors Journal*, 2024.

[26] J. Yan, T. Zhang, L. Ma, **W. Pu***, and H. Liu, "Deployment optimization for integrated search and tracking tasks in netted radar system based on pareto theory", *IEEE Transactions on Aerospace and Electronic Systems*, 2024.

[27] K. Li, H. Liu, B. Jiu, **W. Pu**, X. Peng, and J. Yan, "Knowledge aided model-based reinforcement learning for anti-jamming strategy learning", *IEEE Transactions on Aerospace and Electronic Systems*, 2024.

[28] J. Yan, R. Zhai, T. Yan, **W. Pu**, J. Luo, and H. Liu, "System error estimation for sensor network with integrated sensing and communication application", *Signal Processing*, vol. 213, p. 109 200, 2023.

[29] J. Yan, T. He, L. Ma, **W. Pu**, H. Liu, and M. S. Greco, "Maneuvering resource allocation for coordinated target tracking in airborne radar network", *IEEE Transactions on Signal Processing*, 2023.

[30] J. Dai, **W. Pu***, J. Yan*, Q. Shi, and H. Liu, "Multi-uav collaborative trajectory optimization for asynchronous 3-d passive multitarget tracking", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 61, pp. 1–16, 2023.

[31] J. Dai, J. Yan, **W. Pu**, H. Liu, and M. S. Greco, "Adaptive channel assignment for maneuvering target tracking in multistatic passive radar", *IEEE Transactions on Aerospace and Electronic Systems*, 2022.

[32] J. Dai, J. Yan, J. Lv, *et al.*, "Composed resource optimization for multitarget tracking in active and passive radar network", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1–15, 2022.

[33] K. Li, B. Jiu, **W. Pu**, H. Liu, and X. Peng, "Neural fictitious self-play for radar antijamming dynamic game with imperfect information", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 58, no. 6, pp. 5533–5547, 2022.

[34] J. Yan, H. Jiao, **W. Pu***, C. Shi, J. Dai, and H. Liu, "Radar sensor network resource allocation for fused target tracking: A brief review", *Information Fusion*, 2022.

[35] K. Li, B. Jiu, H. Liu, and **W. Pu**, "Robust antijamming strategy design for frequency-agile radar against main lobe jamming", *Remote Sensing*, vol. 13, no. 15, p. 3043, 2021.

[36] J. Yan, J. Dai, **W. Pu**, H. Liu, and M. Greco, "Target capacity based resource optimization for multiple target tracking in radar network", *IEEE Transactions on Signal Processing*, vol. 69, pp. 2410–2421, 2021.

[37] J. Yan, **W. Pu**, S. Zhou, H. Liu, and M. S. Greco, "Optimal resource allocation for asynchronous multiple targets tracking in heterogeneous radar networks", *IEEE Transactions on Signal Processing*, vol. 68, pp. 4055–4068, 2020.

[38] J. Yan, J. Dai, **W. Pu**, S. Zhou, H. Liu, and Z. Bao, "Quality of service constrained-resource allocation scheme for multiple target tracking in radar sensor network", *IEEE Systems Journal*, vol. 15, no. 1, pp. 771–779, 2020.

[39] J. Yan*, **W. Pu**, S. Zhou, H. Liu*, and Z. Bao, "Collaborative detection and power allocation framework for target tracking in multiple radar system", *Information Fusion*, vol. 55, pp. 173–183, 2020.

[40] Z. Lin, **W. Pu**, and Z.-Q. Luo*, "Minimax design of constant modulus mimo waveforms for active sensing", *IEEE Signal Processing Letters*, vol. 26, no. 10, pp. 1531–1535, 2019.

[41] J. Yan, **W. Pu***, J. Dai, H. Liu, and Z. Bao, "Resource allocation for search and track application in phased array radar based on pareto bi-objective optimization", *IEEE Transactions on Vehicular Technology*, vol. 68, no. 4, pp. 3487–3499, 2019.

[42] J. Yan, H. Liu, **W. Pu**, H. Liu, Z. Liu, and Z. Bao, "Joint threshold adjustment and power allocation for cognitive target tracking in asynchronous radar network", *IEEE Transactions on Signal Processing*, vol. 65, no. 12, pp. 3094–3106, 2017.

[43] J. Yan, H. Liu, **W. Pu**, and Z. Bao, "Exact fisher information matrix with state-dependent probability of detection", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 53, no. 3, pp. 1555–1561, 2017.

[44] J. Yan, **W. Pu**, H. Liu, S. Zhou, and Z. Bao, "Cooperative target assignment and dwell allocation for multiple target tracking in phased array radar network", *Signal Processing*, vol. 141, pp. 74–83, 2017.

[45] J. Yan, H. Liu, **W. Pu**, B. Jiu, Z. Liu, and Z. Bao, "Benefit analysis of data fusion for target tracking in multiple radar system", *IEEE Sensors Journal*, vol. 16, no. 16, pp. 6359–6366, 2016.

[46] J. Yan, H. Liu, **W. Pu**, S. Zhou, Z. Liu, and Z. Bao, "Joint beam selection and power allocation for multiple target tracking in netted colocated mimo radar system", *IEEE Transactions on Signal Processing*, vol. 64, no. 24, pp. 6417–6427, 2016.

[47] J. Yan, H. Liu, **W. Pu**, and Z. Bao, "Decentralized 3-d target tracking in asynchronous 2-d radar network: Algorithm and performance evaluation", *IEEE Sensors Journal*, vol. 17, no. 3, pp. 823–833, 2016.

Conference Papers

[48] H. Dong, **W. Pu**, R. Zhou, X. Fu, and F. Yin, "Integrated interpolation and matrix completion for radio map estimation: A convex optimization approach", in *ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2025, pp. 1–5.

[49] L. Xu, L. Cheng, J. Chen, **W. Pu**, and X. Fu, "Radio map estimation via latent-domain plug-and-play denoisers", in *ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2025, pp. 1–5.

[50] P. Zhang, J. Yan, J. Wang, **W. Pu**, X. Dang, and H. Liu, "Frequency control scheme for target tracking under dynamic electromagnetic environment", in *2024 IEEE International Conference on Signal, Information and Data Processing (ICSIDP)*, IEEE, 2024, pp. 1–6.

[51] Z. Zhang, **W. Pu**, R. Zhou, M. You, W. Wang, and J. Yan, "Efficient position determination using low-rank matrix completion", in *2024 IEEE International Conference on Signal, Information and Data Processing (ICSIDP)*, IEEE, 2024, pp. 1–5.

[52] C. Wang, B. Jiu, **W. Pu**, K. Li, Y. Wu, and H. Liu, "Bounded rationality-based anti-jamming strategy generation for frequency agile radar", in *2024 7th International Conference on Information Communication and Signal Processing (ICICSP)*, IEEE, 2024, pp. 602–607.

[53] L. Liu, **W. Pu***, Y. Li, B. Jiu, and Z.-Q. Luo, "Radar anti-jamming strategy learning via domain-knowledge enhanced online convex optimization", in *2024 IEEE 13rd Sensor Array and Multichannel Signal Processing Workshop (SAM)*, IEEE, 2024, pp. 1–5.

[54] L. Liu, T. Pan, **W. Pu***, B. Jiu, and J. Yan, "Parameter-efficient transformer network for radar anti-jamming strategy design", in *2024 International Conference on Ubiquitous Communication (Ucom)*, IEEE, 2024, pp. 259–263.

[55] R. Zhou, **W. Pu**, L. Zhao, M.-Y. You, Q. Shi, and S. Theodoridis, "Cooperative sensing via matrix factorization of the partially received sample covariance matrix", in *ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2024, pp. 8881–8885.

[56] J. Guan, R. Zhou, **W. Pu**, Q. Shi, and T.-H. Chang, "A robust glrt detector against missing data in cooperative sensing", in *ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2024, pp. 8966–8970.

[57] **W. Pu**, J. Zhang, R. Zhou, X. Fu, and M. Hong, "A smoothed bregman proximal gradient algorithm for decentralized nonconvex optimization", in *ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2024, pp. 8911–8915.

[58] Y. Fan, B. Jiu, **W. Pu**, K. Li, Y. Zhang, and H. Liu, "An inverse reinforcement learning method to infer reward function of intelligent jammer", in *2023 IEEE International Radar Conference (RADAR)*, IEEE, 2023, pp. 1–4.

[59] C. Wang, B. Jiu, **W. Pu**, K. Li, Y. Zhao, and H. Liu, "Anti-jamming equilibrium strategy learning of frequency agile radar based on monte carlo tree search", in *2023 IEEE International Radar Conference (RADAR)*, IEEE, 2023, pp. 1–6.

[60] K. Li, **W. Pu**, and Z.-Q. Luo, "An exploration-estimation beamforming scheme for 5gnr fdd massive mimo communications", in *2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, IEEE, 2023, pp. 146–150.

[61] J. Liu, H. Liu, **W. Pu**, R. Zhou, M.-Y. You, and Q. Shi, "Weak signal detection based on beta divergence", in *2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, IEEE, 2023, pp. 461–465.

[62] L. Zhou, **W. Pu**, M.-Y. You, R. Zhang, and Q. Shi, "Joint optimization of uav deployment and directional antenna orientation for multi-uav cooperative sensing", in *2023 IEEE Wireless Communications and Networking Conference (WCNC)*, IEEE, 2023, pp. 1–5.

[63] H. Li, Z. Han, **W. Pu***, L. Liu, K. Li, and B. Jiu, "Counterfactual regret minimization for anti-jamming game of frequency agile radar", in *2022 IEEE 12th Sensor Array and Multichannel Signal Processing Workshop (SAM)*, IEEE, 2022, pp. 111–115.

[64] J. Dai, X. Mo, **W. Pu**, J. Yan, P. Wang, and H. Liu, "Resource allocation for multiple target tracking in active and passive radar network", in *2021 CIE International Conference on Radar (Radar)*, IEEE, 2021, pp. 2564–2568.

[65] Y. Fan, B. Jiu, **W. Pu**, K. Li, H. Li, and H. Liu, "A probabilistic jamming strategy model for frequency agility radar anti-jamming problem", in *2021 CIE International Conference on Radar (Radar)*, IEEE, 2021, pp. 1131–1135.

[66] **W. Pu**, S. Ibrahim, X. Fu, and M. Hong, "Fiber-sampled stochastic mirror descent for tensor decomposition with β-divergence", in *ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2021, pp. 2925–2929.

[67] B. Song, H. Sun, **W. Pu**, S. Liu, and M. Hong, "To supervise or not to supervise: How to effectively learn wireless interference management models?", in *2021 IEEE 22nd International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, IEEE, 2021, pp. 211–215.

[68] H. Sun, **W. Pu**, M. Zhu, X. Fu, T.-H. Chang, and M. Hong, "Learning to continuously optimize wireless resource in episodically dynamic environment", in *ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2021, pp. 4945–4949.

[69] T. Cao, **W. Pu**, P. Zhang, and Z.-Q. Luo, "Beam pattern synthesis for conformal array with sidelobe and polarization control: A penalized inequality approach", in *2020 IEEE 11th Sensor Array and Multichannel Signal Processing Workshop (SAM)*, IEEE, 2020, pp. 1–5.

[70] **W. Pu**, P. Zan, J. Xiao, T. Zhang, and Z.-Q. Luo, "Evaluation of joint auditory attention decoding and adaptive binaural beamforming approach for hearing devices with attention switching", in *ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2020, pp. 8728–8732.

[71] **W. Pu**, J. Xiao, T. Zhang, and Z.-Q. Luo, "A joint auditory attention decoding and adaptive binaural beamforming algorithm for hearing devices", in *ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2019, pp. 311–315.

[72] Z. Lin, **W. Pu**, and Z.-Q. Luo, "Minimax design of constant modulus mimo waveforms", in *2018 52nd Asilomar Conference on Signals, Systems, and Computers*, IEEE, 2018, pp. 1889–1893.

[73] S. Jiang, **W. Pu**, and Z.-Q. Luo, "Optimal asynchronous multi-sensor registration in 3 dimensions", in *2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, IEEE, 2018, pp. 81–85.

[74] **W. Pu**, Y. Yu, S. Yu, and Z.-Q. Luo, "An alternating minimization approach to optimizing subarray configuration for a large phased array", in *2018 IEEE 10th Sensor Array and Multichannel Signal Processing Workshop (SAM)*, IEEE, 2018, pp. 361–365.

[75] J. Xiao, **W. Pu**, Z.-Q. Luo, and T. Zhang, "Evaluation of the penalized inequality constrained minimum variance beamformer for hearing aids", in *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2018, pp. 3344–3348.

[76] E. Hadad, D. Marquardt, **W. Pu**, *et al.*, "Comparison of two binaural beamforming approaches for hearing aids", in *2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2017, pp. 236–240.

[77] **W. Pu**, J. Xiao, T. Zhang, and Z.-Q. Luo, "A penalized inequality-constrained minimum variance beamformer with applications in hearing aids", in *2017 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, IEEE, 2017, pp. 175–179.

[78] **W. Pu**, Y.-F. Liu, J. Yan, S. Zhou, H. Liu, and Z.-Q. Luo, "A two-stage optimization approach to the asynchronous multi-sensor registration problem", in *2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, IEEE, 2017, pp. 3271–3275.

[79] J. Yan, **W. Pu**, H. Liu, and Z. Bao, "Joint power and bandwidth allocation for centeralized target tracking in multiple radar system", in *2016 CIE International Conference on Radar (RADAR)*, IEEE, 2016, pp. 1–5.

Patents

[80] **W. Pu**, J. Xiao, T. Zhang, and Z. Luo, *Beam former, beam forming method and hearing aid system*, US Patent 11,019,433, May 2021.

[81] **W. Pu**, J. Xiao, and T. Zhang, *EEG-assisted beamformer, beamforming method and ear-worn hearing system*, US Patent 11,617,043, Mar. 2023.