# Curriculum Vitae of Dr. LI, Xiao Peng

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## RESEARCH INTERESTS

- Signal processing based on sparse and low-rank models
- Robust signal processing
- Machine learning, deep neural networks
- DOA estimation, EIT, image/video processing, recommendation system, and financial market analysis

## EDUCATION

- **Ph.D.** in Electrical Engineering — Sep. 2019 - Nov. 2022
  Department of Electrical Engineering, City University of Hong Kong
  Supervisor: Prof. SO, Hing Cheung, **IEEE Fellow**
- **M.Sc. with distinction** in Electronic Information Engineering — Sep. 2017 - Oct. 2018
  Department of Electrical Engineering, City University of Hong Kong
  Supervisor: Prof. SO, Hing Cheung, **IEEE Fellow**
- **B.Eng. as an outstanding graduate** in Electronic Science and Technology — Sep. 2011 - Jul. 2015
  College of Information Engineering, Yanshan University

## POSITIONS

- **Research Associate Professor** — Aug. 2024 - Present
  College of Electronics and Information Engineering, Shenzhen University — Shenzhen, China
- **Assistant Professor** — May 2023 - Present
  College of Electronics and Information Engineering, Shenzhen University — Shenzhen, China
- **Postdoctoral Fellow** — Dec. 2022 - May 2023
  Department of Electrical Engineering, City University of Hong Kong — Hong Kong SAR, China
  Supervisor: Prof. SO, Hing Cheung, **IEEE Fellow**

- **Research Assistant** Sep. 2018 - Aug. 2019
  Department of Information Engineering, Shenzhen University Shenzhen, China
  Supervisor: Prof. HUANG, Lei, **IET Fellow, Distinguished Young Scholar**
- **Software Engineer** Oct. 2015 - Jun. 2017
  Shenzhen Mesh Communication Technology Co. Ltd. Shenzhen, China

# RESEARCH PROJECTS

[1]. PI: Research on single-bit DOA estimation method based on non-convex sparse optimization, Youth Fund Project of National Natural Science Foundation of China, 300,000 RMB, Jan. 2025 - Dec. 2027

[2]. PI: Research on fast and robust direction of arrival (DOA) estimation, Young Innovative Talents Project of Guangdong Education Department (Natural Science), 50,000 RMB, Jan. 2024 - Dec. 2025

[3]. PI: Research on single-bit DOA method, Shenzhen Overseas high-level Talents Research start-up Project, 3000,000 RMB, Jan. 2025 - Dec. 2027

[4]. PI: Research on fast and robust satellite signal acquisition method, Research Initiation Program for Young Teachers, Shenzhen University, 200,000 RMB, Nov. 2023 - Oct. 2025

[5]. Major Participant: Advanced factorization approaches for low-rank matrix recovery, General Research Fund, Hong Kong, 948,822 HKD, Jul. 2022 - Jun. 2025

# HONORS AND AWARDS

- Talent Level C, “Pengcheng Peacock Plan”, Shenzhen 2023
- Research Tuition Scholarship, City University of Hong Kong 2020/21, 2021/22, 2022/23
- Outstanding Academic Performance Award, City University of Hong Kong 2020/21, 2021/22
- Ph.D. Research Scholarship, City University of Hong Kong 2019-2023
- Graduate with Distinction, City University of Hong Kong Oct. 2018
- Outstanding Undergraduate, Yanshan University Jul. 2015

# PUBLICATIONS

**Dissertation:**

[1]. X. P. Li, "Recommender system based on collaborative filtering," M.Sc. dissertation, Department of Electrical Engineering, City University of Hong Kong, 2018.

[2]. X. P. Li, "Signal recovery under specific conditions: from sparse vectors to low-rank matrices and tensors," Ph.D. dissertation, Department of Electrical Engineering, City University of Hong Kong, 2022.

**Refereed journal:**

[1]. **X.-P. Li**, Z.-L. Shi, Y.-H. Xiao, L. Huang, and H. C. So, "Robust single-bit direction-of-arrival estimation with magnitude recovery," *IEEE Journal of Selected Topics in Signal Processing*, Aug. 2025.

[2]. M. Duan, **X.-P. Li***, J.-X. Chen, L. Yang, and M. Dai, "Robust electrical impedance tomography via half-quadratic optimization," *IEEE Signal Processing Letters*, vol. 32, pp. 3022-3026, Jul. 2025. (Corresponding Author)

[3]. **X.-P. Li**, Z.-L. Shi, M. Dai, H. C. So, I. Frerichs, Z. Zhao, and L. Yang, "Robust preprocessing of impulsive motion artifacts using low-rank matrix recovery for electrical impedance tomography," *IEEE Transactions on Computational Imaging*, vol. 11, pp. 942 - 954, Jul. 2025.

[4]. **X.-P. Li**, Z.-L. Shi, M. Dai, H. C. So, G. Xue, Z. Zhao, and L. Yang, "Robust electrical impedance tomography for respiratory monitoring," *IEEE Transactions on Instrumentation and Measurement*, vol. 74, p. 4013112, Jul. 2025.

[5]. Z. Zhang, **X.-P. Li**, and Q. Liu, "SAEN-BGS: Energy-efficient spiking autoencoder network for background subtraction," *Pattern Recognition*, vol. 169, p. 111792, Jan. 2026.

[6]. J.-R. Yang, Z.-L. Shi, **X.-P. Li**, W. Xiong, Y. Fu, and X. Liang, "Adaptive robust MIMO radar target localization via capped Frobenius norm," *Signal Processing*, vol. 237, p. 110069, Dec. 2025.

[7]. W. Ma, P. Zhang, J. Ye, R. Guan, **X.-P. Li**, and L. Huang, "Joint antenna selection and beamforming design for active RIS-aided ISAC systems," *IEEE Internet of Things Journal*, vol. 12, no. 14, Jul.2025.

[8]. M. Dai, **X.-P. Li**, Z. Zhao, and L. Yang, "Reduction of spike-like noise in clinical practice for thoracic electrical impedance tomography using robust principal component analysis," *Bioengineering*, vol. 12, No. 4, Apr. 2025.

[9]. X. Y. Wang, **X.-P. Li***, H. C. So, and Nikolaos D. Sidiropoulos, "Tensor completion network for visual data," *IEEE Transactions on Signal Processing*, 2025. (Corresponding Author)

[10]. M. Duan, **X.-P. Li***, M. Hua, L. Huang, and Q. Li, "2D-DOA estimation for NLOS environments via intelligent reflecting surface," *Journal of Systems Engineering and Electronics*, Aug. 2025. (Corresponding Author)

[11]. X. Y. Wang, **X.-P. Li***, H. C. So, and Nikolaos D. Sidiropoulos, "Tensor completion network for visual data," *IEEE Transactions on Signal Processing*, vol. 73, pp. 386-400, Jan. 2025. (Corresponding Author)

[12]. Y.-H. Xiao, D. Ramírez, L. Huang, **X. P. Li**, and H. C. So, "One-bit target detection in colocated MIMO radar with colored background noise," *IEEE Transactions on Signal Processing*, vol. 72, pp. 5274-5290, Nov. 2024.

[13]. **X. P. Li**, Z.-L. Shi, C-S, Leung, and H. C. So, "Projected gradient descent method for cardinality-constrained portfolio optimization," *Journal of the Franklin Institute,* vol. 361, no. 18, p. 107267, Dec. 2024.

[14]. Z.-L. Shi, W. Xiong, **X. P. Li***, W. Li, Y. Fu, and H. C. So, "An $\ell_0$-norm optimization-based algorithm for robust and efficient MIMO localization," *IEEE Transactions on Aerospace and Electronic Systems,* 2024. (Corresponding Author)

[15]. S. Chen, W.Sun, L. Huang, **X. P. Li**, Q. Wang, and D. John,"POCKET: Pruning random convolution kernels for time series classification from a feature selection perspective," *Knowledge-Based Systems*, vol. 300, p. 112253, Sep. 2024.

[16]. Y. Y. CHAN, **X. P. Li**, J. J. MAI, C. S. Leung, and H. C. So, "Sparse unmixing in the presence of mixed noise using $\ell_0$-norm constraint and Log-cosh loss," *IEEE Transactions on Geoscience and Remote Sensing,* vol. 62, pp. 1-19, Aug. 2024.

[17]. **X. P. Li**, C-S, Leung, and H. C. So, "Sparse recovery under nonnegativity and sum-to-one constraints," *Information Sciences*, vol. 679, p. 121059, Sep. 2024.

[18]. X. Y. Wang, **X.-P. Li***, and H. C. So, "Robust sparse representation based on fitting error decomposition," *Signal Processing,* vol. 222, p.109523, Sep. 2024. (Corresponding Author)

[19]. X. Y. Wang, **X.-P. Li***, H. Huang, and H. C. So, "Robust DOA estimation with distorted sensors," *IEEE Transactions on Aerospace and Electronic Systems,* vol. 60, no. 5, pp. 5730-5741, Oct. 2024. (Corresponding Author)

[20]. **X.-P. Li**, Z.-L. Shi, L. Huang, A. M.-C. So, and H. C. So, "ROCS: Robust one-bit compressed sensing with application to direction of arrival," *IEEE Transactions on Signal Processing*, vol. 72,

pp. 2407-2420, Apr. 2024.

[21]. Z. Liu, H. C. So, L. Zhang, **X. P. Li**, and Z.-Y. Wang, "A reliable singular-vector pre-coded OFDM-DCSK system over doubly selective fading channels," *IEEE Wireless Communications Letters*, vol. 12, no. 5, pp. 1453-1457, May 2024.

[22]. M. Chen, Q. Li, **X. P. Li**, L. Huang, and M. Rihan, "One-bit DoA estimation for deterministic signals based on $\ell_{2,1}$-norm minimization," *IEEE Transactions on Aerospace and Electronic Systems,* vol. 60, no. 2, pp. 2438-2444, Apr. 2024.

[23]. X. Y. Wang, **X. P. Li**$^*$, and H. C. So, "Truncated quadratic norm minimization for bilinear factorization based matrix completion," *Signal Processing*, vol. 214, p. 109219, Jan. 2024. (Corresponding Author)

[24]. **X. P. Li**, Z. Liu, Z.-L. Shi, and H. C. So, "MUSIC with capped Frobenius norm: Efficient robust direction-of-arrival estimator," *IEEE Transactions on Aerospace and Electronic Systems,* vol. 59, no. 6, pp. 8090-8103, Dec. 2023.

[25]. **X. P. Li**, Y. Yan, E. E. Kuruoglu, H. C. So, and Y. Chen, "Robust recovery for graph signal via $\ell_0$-norm regularization," *IEEE Signal Processing Letters*, vol. 30, pp. 1322-1326, Sep. 2023.

[26]. Z.-L. Shi, **X. P. Li**, W. Li, T. Yan, J. Wang, and Y. Fu, "Robust low-rank matrix recovery as mixed integer programming via $\ell_0$-norm optimization," *IEEE Signal Processing Letters*, vol. 30, pp. 1012-1016, Aug. 2023.

[27]. Z. Liu, H. C. So, **X. P. Li**$^*$, L. Zhang, and Z. Y. Wang, "Robust and energy efficient sparse-coded OFDM-DCSK system via matrix recovery," *IEEE Transactions on Communications*, vol. 71, no. 8, pp. 4839-4850, Aug. 2023. (Corresponding Author)

[28]. Z. Liu, **X. P. Li**$^*$, and H. C. So, "$\ell_0$-Norm minimization based robust matrix completion approach for MIMO radar target localization," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 59, no. 5, pp. 6759-6770, Oct. 2023. (Corresponding Author)

[29]. Z.-Y. Wang, **X. P. Li**$^*$, H. C. So$^*$, and Abdelhak M. Zoubir, "Adaptive rank-one matrix completion using sum of outer products," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 33, no. 9, pp. 4868-4880, Sep. 2023. (Corresponding Author)

[30]. **X. P. Li**, Z.-Y. Wang, Z.-L. Shi, H. C. So, and N. D. Sidiropoulos, "Robust tensor completion via capped Frobenius norm," *IEEE Transactions on Neural Networks and Learning Systems*, vol. 35, no. 7, pp. 9700-9712, Jul. 2024.

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[33]. Z.-Y. Wang, **X. P. Li**, and H. C. So, "Robust matrix completion based on factorization and truncated-quadratic loss function," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 33, no. 4, pp. 1521-1534, Apr. 2023.

[34]. Z.-L. Shi, **X. P. Li**$^*$, C. S. Leung$^*$, and H. C. So, "Cardinality constrained portfolio optimization via alternating direction method of multipliers," *IEEE Transactions on Neural Networks and Learning Systems,* vol. 35, no. 2, pp. 2910-2909, Feb. 2024 (Corresponding Author)

[35]. **X. P. Li**, Z.-L. Shi, C.-S. Leung, and H. C. So, "Sparse index tracking with $k$-sparsity or $\epsilon$-deviation constraint via $\ell_0$-norm minimization," *IEEE Transactions on Neural Networks and Learning Systems,* vol. 34, no. 12, pp. 10930-10943, Dec. 2023.

[36]. **X. P. Li**, M. Wang, and H. C. So, "An interpretable bi-branch neural network for matrix completion," *Signal Processing,* vol. 200, p. 108640, Nov. 2022.

[37]. Q. Liu and **X. P. Li**$^*$, "Efficient low-rank matrix factorization based on $\ell_{p,\epsilon}$-norm for online subtraction," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 32, no. 7, pp. 4900-4904, Jul. 2022. (Corresponding Author)

[38]. Q. Liu, **X. P. Li**$^*$, H. Cao, and Y. Wu, "From simulated to visual data: A robust low-rank tensor completion approach using $\ell_p$-regression for outlier resistance," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 32, no, 6, pp. 3462-3474, Jun. 2022. (Corresponding Author)

[39]. Q. Liu, **X. P. Li**$^*$, and J. Yang, "Optimum co-design for image denoising between type-2 fuzzy identifier and matrix completion denoiser," *IEEE Transactions on Fuzzy Systems*, vol. 30, no. 1, pp. 287-292 Jan. 2022. (Corresponding Author)

[40]. Z. Liu, H. C. So, L. Zhang, and **X. P. Li**, "Robust receiver for OFDM-DCSK modulation via rank-1 modeling and $\ell_p$-minimization," *Signal Processing*, vol. 188, p. 108219, Nov. 2021.

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[43]. **X. P. Li**, Q. Liu, and H. C. So, "Rank-one matrix approximation with $\ell_p$-norm for image inpainting," *IEEE Signal Processing Letters*, vol. 27, pp. 680-684, Apr. 2020.

**Conference:**

[1]. J. Ye, P. Zhang, **X.-P. Li**, L. Huang, and Yuanwei Liu, "Fluid RIS-aided communication systems with one-bit DACs: Design and optimization," in *Proc. IEEE Vehicular Tech. Conf.*, Chengdu, China, Oct. 2025.

[2]. T. Zhu, L. Xie, **X.-P. Li***, H. Huang, L. Wu, and L. Huang, "Near field one bit angle-range estimation," in *Proc. IET International Radar Conference,* Jiaxing, China, Nov. 2025.

[3]. S. Wang, S. Lai, **X. P. Li**, X. Chen, Q. Li, and L. Huang, "Robust source enumeration for radar echo signals using density-based spatial clustering," in *Proc. 8th Int. Conf. Infor. Commun. Signal Process.*, Xi'an, China, Sep. 2025.

[4]. J. Chen, **X. P. Li***, M. Duan, L. Yang, and M. Dai, "Electrical impedance tomography signal denoising via low-rank matrix recovery," in *Proc. 8th Int. Conf. Infor. Commun. Signal Process.*, Xi'an, China, Sep. 2025.

[5]. Z. Wang, Q. Li, **X. P. Li**, and L. Huang, "Vandermonde decomposition reconstruction for DOA estimation with sparse arrays," in *Proc. 24th Int. Conf. Commun. Tech.*, Chengdu, China, Oct. 2024.

[6]. M. Duan, **X. P. Li***, M. Hua, L. Huang, and Q. Li, "Intelligent reflecting surface aided 2D-DOA estimation for NLOS target," in *Proc. 7th Int. Conf. Infor. Commun. Signal Process.*, Zhoushan, China, Sep. 2024. (Oral Presentation)

[7]. Z.-L. Shi, W. Xiong, **X. P. Li**, W. Li, Y. Fu, and X. Liang,"Robust distributed MIMO localization based on binary hard weighting," in *Proc. 9th Int. Conf. Signal Image Process.*, Nanjing, China, Jun. 2024. (Oral Presentation)

[8]. **X. P. Li**, Z.-L. Shi, L. Yang, and M. Dai, "Improving imaging quality for electrical impedance tomography via low-rank matrix recovery," in *Proc. 24th Int. Conf. Biomedical Applications of Electrical Impedance Tomography (EIT 2024)*, Hangzhou, China, 2024. (Oral Presentation)

[9]. S. Parveen, M. Heyat, F. Akhtar, S. Parveen, B. Ali, B. Singh, K. Ali, L. Huang, **X. P. Li**, A. Jabbar, M. Asad, and J. LI, " Interweaving artificial intelligence and bio-signals in mental fatigue: Unveiling dynamics and future pathways," *20th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP)*, 2023.

# PATENTS

[1]. L. Huang, M. Chen, Q. Li, **X. P. Li**, L. Feng, P. Wu, “Method, system,and intelligent terminal for one-bit quantization direction of arrival estimation”, US 12,044,786B1, Jul. 2024.

[2]. **X. P. Li**, M. Duan, and L. Huang, “Method and system of direction of arrival estimation assisted by intelligent reflector is presented,” 202410577209.X, 2024.

[3]. **X. P. Li** and Z. Shi, “Electrical impedance tomography data processing method and device based on low rank matrix recovery,” 202410800537.X, Dec. 2024.

[4]. **X. P. Li**, L. Huang, M. Chen, and Q. Li, “A robust acquisition method of satellite signal with double sparse optimized array antenna and related equipment,” ZL202310966127.8, Feb. 2024.

[5]. **X. P. Li** and L. Huang, “Direction of arrival estimation method and related equipment based on single bit quantization antenna array”, ZL202310672449.1, Jun. 2023.

[6]. Z.-Y. Wang, **X. P. Li**, H. C. So and A. M. Zourbir, “Method and electronic device for recovering data using adaptive rank-one matrix completion”, US 12,141,037 B2, Nov. 12, 2024.

[7]. **X. P. Li**, C-S Leung and H. C. So, “Method and analysis device for tracking market index and unmixing hyperspectral image using modified iterative hard thresholding for nonnegative sparse recovery under sum-to-one”, US 2023/0230116 A1, Jul. 2023.

[8]. **X. P. Li**, M. Wang and H. C. So, “Method and electronic device for recovering data using bi-branch neural network”, US2023/0401431 A1, Dec. 2023.

# PROFESSIONAL ACTIVITIES

**Invited Talk:**

[1]. “Robust Single-bit DoA estimation”, IET International Radar Conference, Wuxi, China, 23 Nov. 2025.

[2]. “Robust Single-bit DoA estimation”, Radar Radio Industry Conference, Nanjing, China, 8 Nov. 2025.

[3]. “Robust Tensor Completion via Capped Frobenius Norm”, hosted by Dr. Zhang-Lei Shi, College of Science, China University of Petroleum (East China), Qingdao, 20 Oct. 2023.

[4]. “An Interpretable Bi-Branch Neural Network for Matrix Completion”, hosted by Prof. Nikolaos D. Sidiropoulos (IEEE Fellow), Department of Electrical and Computer Engineering, University of Virginia, Virginia, USA, 11 Feb. 2022. (Online)

**Chair**

- Finance Co-Chair, IEEE 14th Sensor Array and Multichannel Signal Processing Workshop (SAM), Shenzhen, 2026.

**Technical Committee:**

- International Conference on Signal and Image Processing (ICSIP), Nanjing, China, 2024

**Technical Reviewer:**

- Signal Processing
- IET Signal Processing
- Digital Signal Processing
- IEEE Signal Processing Letters
- IEEE/CAA Journal of Automatica Sinica
- IEEE Transactions on Cybernetics
- IEEE Transactions on Communications
- IEEE Transactions on Image Processing
- IEEE Transactions on Signal Processing
- IEEE Transactions on Information Theory
- IEEE Transactions on Vehicular Technology
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Systems, Man, and Cybernetics: Systems
- IEEE Journal of Selected Topics in Signal Processing
- IEEE Journal of Biomedical and Health Informatics
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Emerging Topics in Computational Intelligence

# TEACHING EXPERIENCE

**Shenzhen University**

- Foundation of Optimization — Sem. A 2025/26, Sem. A 2024/25
- Numerical Computing Methods — Sem. A 2025/26

Sem. A 2024/25

Sem. A 2023/24

- Lecture on World Frontier Science and Technology — Sem. A 2023/24

**City University of Hong Kong (ASSISTANT)**

- EE 5410 - Signal Processing — Sem. A 2020/21, Sem. A 2022/23
- EE 4016 - Engineering Applications of Artificial Intelligence — Sem. B 2020/21, Sem. A 2021/22
- EE 3331 - Probability Models in Information Engineering — Sem. B 2021/22