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院长, 研究员, 博士生导师, IEEE Senior Member
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Professor, Ph.D. Supervisor

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OFFICE (SUZHOU): Room B203-12, Lab 22
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Working Experience (工作经历)

2025.08–	Dean (院长)
2025.08–	Professor (教授), Ph.D Supervisor (博士生导师) School of Electronics Information, Aerospace Information Technology University 空天信息大学, 电子信息学院 , Jinan, Shandong 250200, China 研究方向: 稀疏信号处理, 稀疏微波成像, 合成孔径雷达, 三维成像, 深度学习与信号处理的结合, 机器学习.
2023.01–	Lab Vice Director (副主任), Academic Leader (学术带头人)
2022.04–	Professor (研究员), Ph.D Supervisor (博士生导师)
2021.01–2022.04	Associate Professor (副研究员, “百人计划” 创新研究员), 硕士生导师 Aerospace Information Research Institute, CAS 中国科学院空天信息创新研究院 , Beijing 100190, China National Key Laboratory of Microwave Imaging 微波成像全国重点实验室 , Beijing 100190, China Suzhou Aerospace Information Research Institute 苏州空天信息研究院 , Suzhou, Jiangsu 215000, China Suzhou Key Laboratory of Microwave Imaging, Processing and Application Technology 苏州市微波成像处理及应用技术重点实验室 , Suzhou, Jiangsu 215000, China 研究方向: 稀疏信号处理, 稀疏微波成像, 合成孔径雷达, 三维成像, 深度学习与信号处理的结合, 机器学习.

2023.10–	Double Employed Professor (双聘教授) University of Chinese Academy of Sciences 中国科学院大学, Beijing 100190, China
2023.09–	Adjunct Professor (兼职教授) Qian Xuesen Honors College, Xi'an Jiaotong University 西安交通大学, 钱学森学院, Xi'an, Shaanxi 710049, China
2024.10–	Adjunct Professor (兼职教授) Harbin Engineering University 哈尔滨工程大学, Harbin, Heilongjiang, China
2025.05–	Adjunct Professor (兼职教授) Beijing University of Posts and Telecommunications 北京邮电大学, Beijing, China
2016.12–2020.06	Post-Doctoral Research Fellow (博士后研究员) George Mason University , Fairfax, VA 22030, USA Advisor: Tian, Zhi (田智), Professor, IEEE Fellow 研究方向: 稀疏信号处理, 原子范数优化, 深度学习与信号处理的结合.
2015.12–2016.11	Post-Doctoral Research Scientist (博士后研究员) George Washington University , Washington, DC 20052, USA Advisor: Tian, Zhi (田智), Professor, IEEE Fellow Cheng, Xiuzhen (成秀珍), Professor, IEEE Fellow 研究方向: 稀疏信号处理, 原子范数优化.

Education (教育经历)

2009.09–2015.07	PH.D. (工学博士) / 信号与信息处理 Institute of Electronics, Chinese Academy of Sciences University of Chinese Academy of Sciences 中国科学院电子学研究所 / 中国科学院大学, Beijing 100190, China Supervisor: 吴一戎, 中国科学院院士, 研究员 研究方向: 稀疏微波成像, 稀疏信号处理, 合成孔径雷达.
2014.01–2014.04	VISITING STUDENT (访问学生) University of Connecticut , Storrs, CT 06269, USA Supervisor: Zhou, Shengli (周胜利), Professor, IEEE Fellow.
2004.09–2008.07	B. ENG. (工学学士) / 信息工程, 电子与信息工程学院
2003.09–2004.07	SPECIAL CLASS FOR GIFTED YOUNG (少年班) Xi'an Jiaotong University 西安交通大学, Xi'an, Shaanxi 710049, China.

Research Projects (研究项目)

2023.12-	<p>多波束星载高分宽幅 SAR 系统技术, 2535 万元</p> <p>资助: 国家重点研发计划, #2023YFB3904900</p> <p>项目主持人 (首席科学家).</p>
2023.1-	<p>稀疏信号处理及其在微波成像中的应用研究, 300 万元</p> <p>资助: 国家自然科学基金 (NSFC) 优秀青年科学基金 (海外)</p> <p>项目主持人.</p>
2024.7-	<p>基于昇腾底座的多模态遥感大数据智能平台技术研发及其应用, 500 万元</p> <p>资助: 江苏省前沿技术研发计划项目</p> <p>项目主持人.</p>
2021.1-2023.12	<p>稀疏信号处理与深度学习及其在微波成像中的应用, 400 万元</p> <p>资助: 中国科学院 “百人计划”</p> <p>项目主持人.</p>
2021.12-	<p>微波三维成像的高效感知系统与技术的研发, 50 万元</p> <p>资助: 苏州市科技发展项目, #ZXL2022381</p> <p>项目主持人.</p>
2023.1-	<p>基于稀疏信号处理与微波视觉理论的微波三维成像雷达系统, 50 万元</p> <p>资助: 江苏省 “双创人才”</p> <p>项目负责人.</p>
2023.1-	<p>智能边端系统算力评估与协同部署研究, 200 万元</p> <p>资助: KJW * * * * 协同创新中心课题</p> <p>课题负责人.</p>
2023.1-	<p>* * * * * SAR 成像处理与信息提取, 200 万元</p> <p>资助: 中国科学院 * * * * * 重点部署项目</p> <p>课题负责人.</p>
2021.7-	<p>结构信号的自适应高效感知理论及在微波成像中的应用, 130 万元</p> <p>资助: 中科院空天院前沿科学与颠覆性先导专项</p> <p>项目主持人.</p>
2023.1-	<p>* * * * * 星载 SAR 系统技术, 8500 万元</p> <p>资助: KJW * * * * 创新特区重点项目</p> <p>项目核心参与人, 处理系统负责人.</p>
2023.1-	<p>街角盲区建筑布局重建机理与方法, 500 万元</p> <p>资助: KJW * * * * 基础加强课题</p> <p>子课题负责人.</p>
2020.1-	<p>合成孔径雷达微波视觉三维成像理论与应用基础研究, 2000 万元</p> <p>资助: 国家自然科学基金 (NSFC) 重大项目, #61991421, 61991420</p> <p>子课题负责人.</p>
2018.8-2018.11	<p>A Gated LFM CW TDMA MIMO SAR based Hidden Chamber Detector, 15 万美元</p>

	资助: <i>USSOCOM SBIR</i> , #S173-004-0118 信号处理及仿真负责人.
2015.12–2020.6	Task-Cognizant Sparse Sensing for Inference , 40 万美元 资助: <i>National Science Foundation (NSF) Standard Grant</i> , #1527396 参与.
2010.04–2015.07	稀疏微波成像的理论、体制和方法研究 , 3300 万元 资助: 国家重大基础科学研究计划 (<i>973 计划</i>), #2010CB731900 机载部分负责人.
2012.04–2015.07	先进微波探测与信息处理 , 430 万元 资助: 中国科学院 / 国家外国专家局 “创新团队” 合作伙伴计划 核心参与人.

Honors (荣誉)

2024.09	江苏省首席科技传播专家 / 江苏省科协
2024.11	Wiley 威立中国高贡献作者 (Wiley China Excellent Author Program) / <i>Wiley</i>
2022.01	国家优秀青年基金 (海外) / 国家自然科学基金委员会 (<i>NSFC</i>)
2021.01	中国科学院 “百人计划” / 中国科学院
2021.12	苏州市 “姑苏领军人才” / 苏州市
2022.12	江苏省 “双创人才” / 江苏省
2022	中国科学院 “青年交叉团队” 成员 / 中国科学院

Awards (获奖)

2022.03	全国颠覆性技术创新大赛 / 中华人民共和国科技部 总决赛优秀奖
2021.12	优胜奖
2021.12	优秀奖
2008.04	德州仪器 (TI) DSP 大奖赛 / <i>Texas Instruments</i> 优胜奖
2008.02	美国大学生数学建模竞赛 / <i>COMAP</i> <i>Meritorious</i> (一等奖)
2007.02	<i>Honorable Mentioned</i> (二等奖)
2006.09	中国大学生数学建模竞赛 / 中国工业与应用数学学会 (<i>CSIAM</i>)

Services (学术服务)

Professional Society Membership and Services (学术组织与服务)

2021.07–	Xi'an Jiaotong-Liverpool University (西交利物浦大学)
2021.11–	External Mentor (校外导师)
	Pilotage Mentor (领航导师)
2024.01–	IEEE
2016.01–2024.01	Senior Member
2010.01–2015.12	Member
	Student Member
2024.06–	CSIG (中国图象图形学学会)
	微波智能成像专业委员会 (筹)
	专委会委员
2024.06–	CNC-ISDE (国际数字地球学会中国国家委员会)
	微波对地观测专业委员会
	专委会委员
2025.05–	CIC (中国通信学会)
	高级会员
2025.05–	空天地融合通信网络专业委员会
	专委会委员
2024.11–	苏州市青年科技工作者协会
	理事
2021.04–	CIE (中国电子学会)
	Member (会员)
2020.11–	JSAAI (江苏省人工智能学会)
	Member (会员)

Journal Reviewers (期刊审稿人)

- IEEE Transactions on Signal Processing Journal, SCI.
- IEEE Signal Processing Letters Journal, SCI.
- IEEE Open Journal of Signal Processing Journal, SCI.
- IEEE Journal of Selected Topics in Signal Processing Journal, SCI.
- Signal Processing Journal, SCI.
- National Science Open Journal, SCI.
- IEEE Transactions on Geoscience and Remote Sensing Journal, SCI.

- *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* Journal, SCI.
- *IEEE Geoscience and Remote Sensing Letters* Journal, SCI.
- *IEEE Transactions on Industrial Electronics* Journal, SCI.
- *IEEE Sensors Journal* Journal, SCI.
- *IET Radar, Sonar & Navigation* Journal, SCI.
- *IET Electronics Letters* Journal, SCI.
- *IET Signal Processing* Journal, SCI.
- *Remote Sensing* Journal, SCI.
- *Science China Information Science* Journal, SCI.
- *Cogent Engineering* Journal, SCI.
- *Geo-spatial Information Science* Journal, SCI.
- *International Journal of Microwave and Wireless Technologies* Journal, SCI.
- *IEEE Access* Journal, SCI.
- *Tsinghua Science and Technology* Journal, SCI.
- *IEEE Transactions on Circuits and Systems for Video Technology* Journal, SCI.
- *IEEE Wireless Communications Letters* Journal, SCI.
- *Journal of Communications and Networks* Journal, SCI.
- *IEEE Transactions on Computational Imaging* Journal, SCI.
- 雷达学报 Journal, EI.

Vice President of Organizing Committee Member (学术会议组委会副主席)

- 第五届全国雷达对地观测大会, Suzhou, China, May 23-25, 2025.

Organizing Committee Member and Technical Program Chair (学术会议组委会成员及学术主席)

- 2022 International Workshop on Microwave Vision and 3D SAR Imaging (MiViSAR 2022), Suzhou, China, Oct 17-19, 2022.

Session Chair (学术会议分会场主席)

- 2023 IET International Radar Conference, Chongqing, China, Dec 3-5, 2023.
- 2024 Photonics and Electromagnetics Research Symposium (PIERS), Chengdu, China, Apr 21-25, 2024.
- 2024 IEEE International Conference on Signal, Information and Data Processing (ICSIDP), Zhuhai, China, Nov 22-24, 2024.

TPC Member / Reviewer (学术会议学术委员会成员 / 审稿人)

2024	PIERS 2024, ICC 2024, CoSeRa 2024, EECSI 2024, Globecom2024, IJEECS 2024, EEET 2024, ICSIDP 2024, AIT 2024.
2023	EECSI 2023, iSemantic 2023, Globecom 2023, SIRS 2023, IJCDS 2023, IJEECS 2023, IET Radar 2023.
2022	EEET 2022, EECSI 2022, IJCDS, IJECE 2021-22, FSDM 2022.
2021	IJEECS 2021, BEEI 2020-21, ICITech 2021, FSDM 2021, TELKOMNIKA 2021.
2020	CITEI 2020, SIRS 2020, FSDM 2020.
2019	SIRS 2019, DISP 2019
2018	CoSeRa 2018, SIRS 2018, EECSI 2018, ICW-TELKOMNIKA 2018, FSDM 2018.
2017	ICITech 2017, EECSI 2017, SIRS 2017, FSDM 2017.
2016	CoSeRa 2016.
2015	CoSeRa 2015, ISSPIT 2015, ICSPDM 2015.

Professional Skills (专业技能)

专业方向: 深度学习/AI, 机器学习与信号处理方法的结合, 稀疏信号处理与低秩优化, 合成孔径雷达.

专业技能: 大型在线社区开发、运营与维护, Linux 运维, GNU 工具链, \LaTeX . MATLAB, C/C++/Python/JavaScript.

Languages (语言)

ENGLISH: Professional (Reside in US for 5 years, CET-6/PETS-5/WSK pass, TOEFL 96)

JAPANESE: Fair

Hobbies (兴趣)

IT, 开源, 编程, Linux, 数码, 互联网.

音乐, 动漫, 历史, 常旅客.

Open Source Projects and Services (主持开源项目)

2006.04–2015.11 | 兵马俑 BBS (<http://bbs.xjtu.edu.cn/>, <http://bmybbs.com/>)

	Host: https://github.com/bmybbs?type=source <i>Technical Leader</i> 兵马俑 BBS 是中国教育网最大的 BBS 站点之一, 属于西安交通大学. 兵马俑 BBS 服务 50000 多名用户, 同时在线数最高 5000. 项目代码超过 10 万行.
2010.06–2019.04	科苑星空 BBS (http://bbs.ucas.ac.cn/ , http://kyxk.net/) <i>Technical Leader</i> 科苑星空 BBS 是中国科学院的官方社区. 科苑星空 BBS 服务 30000 多名用户, 同时在线数最高 1500. 项目代码超过 12 万行.
2018.09–	hCNN (https://github.com/pzhg/hCNN) <i>Principle Developer</i> hCNN 是一个开源的、深度学习与信号处理结合的开发框架, 可方便的进行深度学习开发与训练, 并传统信号处理方法兼容.

Publications (Bold for Corresponding / First Authorship)

JOURNAL ARTICLES

1. 王骛巍, 商明样, and 张柘*, “一种改进 DBF 方法用于多通道 SAR 非均匀采样重构,” 河南科技大学学报, vol. 46, no. 3, pp. 1–10, 2025.
2. 海那尔·哈那提, 张柘, 朱利鲁, and 吴一戎*, “基于区块链的多模态遥感大数据治理方法与系统,” 河南科技大学学报, vol. 46, no. 2, pp. 1–11, 2025, doi: 10.15926/j.cnki.issn1672-6871.2025.02.001.
3. C. Wang, Q. Yan, X. Qiu, Y. Luo, L. Peng, and Z. Zhang, “A Geometric Semantic Enhanced TomoSAR Reconstruction Algorithm in an Urban Area: Analysis and Application,” J. Remote Sens., vol. 5, Jan. 2025, doi: 10.34133/remotesensing.0583.
4. Z. Jin, Z. Pan, Z. Zhang*, and X. Qiu, “SAAS-Net: Self-Supervised Sparse Synthetic Aperture Radar Imaging Network with Azimuth Ambiguity Suppression,” Remote Sens., vol. 17, no. 6, p. 1069, Mar. 2025, doi: 10.3390/rs17061069.
5. D. Zhao, Z. Zhang*, D. Lu, X. Qiu, W. Li, H. Li, and Y. Wu, “CV-YOLO: A Complex-Valued Convolutional Neural Network for Oriented Ship Detection in Single-Polarization Single-Look Complex SAR Images,” Remote Sens., vol. 17, no. 8, p. 1478, Apr. 2025, doi: 10.3390/rs17081478.
6. S. Song, X. Qiu*, S. Shangguan, Y. Luo, Z. Li, and Z. Zhang, “A polarization-power-maximum-based 3D imaging method for Ku-band UAV-borne fully-polarimetric array InSAR,” IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens., vol. 18, pp. 10320–10336, 2025, doi: 10.1109/JSTARS.2025.3555662.
7. Z. Wang, Z. Wang, X. Qiu, and Z. Zhang*, “Fine classification of multi-frequency PolSAR images using an adaptive fusion network,” Remote Sens. Lett., vol. 16, no. 5, pp. 461–471, May 2025, doi: 10.1080/2150704X.2025.2470884.
8. Y. Huang, H. Li, D. Lu, Z. Zhang, and W. Tie*, “Intelligence Evaluating Computational Power: A Multi-Factor Method,” IEEE Access, vol. 13, pp. 27398–27415, 2025, doi: 10.1109/ACCESS.2025.3538977.
9. D. Wang, D. Lu, J. Zhao, W. Li, H. Li, J. Xu, J. Huang, and Z. Zhang*, “Multiscale Pillars Fusion for 4-D Radar Object Detection With Radar Data

- Enhancement,” IEEE Sens. J., vol. 25, no. 3, pp. 5102–5115, Feb. 2025, doi: 10.1109/JSEN.2024.3516786.**
10. R. Shi, Y. Luo, Z. Zhang, X. Qiu*, and C. Ding, “A Three-Dimensional Imaging Method for Unmanned Aerial Vehicle-Borne SAR Based on Nested Difference Co-Arrays and Azimuth Multi-Snapshots,” *Remote Sens.*, vol. 17, no. 3, p. 516, Feb. 2025, doi: 10.3390/rs17030516.
 11. G. Zhou*, Y. Zuo, Z. Zhang, B. Zhang, and Y. Wu, “CR-DEQ-SAR: A Deep Equilibrium Sparse SAR Imaging Method for Compound Regularization,” *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.*, vol. 18, pp. 4680–4695, 2025, doi: 10.1109/JSTARS.2025.3533082.
 12. M. Shao*, Y. Fan, Y. Zhang, Z. Zhang, J. Zhao, and B. Zhang, “A Novel Gridless Non-Uniform Linear Array Direction of Arrival Estimation Approach Based on the Improved Alternating Descent Conditional Gradient Algorithm for Automotive Radar System,” *Remote Sens.*, vol. 17, no. 2, p. 303, Jan. 2025, doi: 10.3390/RS17020303.
 13. P. Jiang, S. Gao, J. Zhao, Z. Zhang*, and B. Zhang, “Gridless DOA Estimation with Extended Array Aperture in Automotive Radar Applications,” *Remote Sens.*, vol. 17, no. 1, p. 33, Dec. 2024, doi: 10.3390/rs17010033.
 14. G. Zhou, Z. Zhang*, B. Zhang, and Y. Wu, “An innovative semantically guided SAR imaging and target enhancement method,” *Electron. Lett.*, vol. 60, no. 24, p. e70123, Dec. 2024, doi: 10.1049/ell2.70123.
 15. M. Wang, S. Gao, X. Qiu*, and Z. Zhang, “A Novel Phase Error Estimation Method for TomoSAR Imaging Based on Adaptive Momentum Optimizer and Joint Criterion,” *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.*, vol. 18, pp. 2042–2051, 2025, doi: 10.1109/JSTARS.2024.3506852.
 16. X. Qiu*, Z. Jiao, Z. Zhang, Q. Yan, and C. Ding*, “Advances and prospects in SAR microwave vision three-dimensional imaging,” *Natl. Sci. Open*, vol. 3, no. 5, p. 20240009, Sep. 2024, doi: 10.1360/nso/20240009.
 17. Y. Zhao, D. Xiao, Z. Pan, B. W. K. Ling, Y. Tian, and Z. Zhang*, “Sparse SAR Imaging Based on Non-Local Asymmetric Pixel-Shuffle Blind Spot Network,” *Remote Sens.*, vol. 16, no. 13, p. 2367, Jun. 2024, doi: 10.3390/rs16132367.
 18. 仇晓兰, 罗一通, 宋舒洁, 彭凌霄, 程遥, 颜千程, 上官松涛, 焦泽坤, 张栢, 丁赤飏, “微波视觉三维 SAR 实验系统及其全极化数据处理方法,” *雷达学报*, vol. 13, no. 5, pp. 941–954, Sep. 2024, doi: 10.12000/JR24137.
 19. S. Gao, M. Wang, Z. Zhang*, B. Zhang, and Y. Wu, “Efficient Gridless DOA Estimation for Nonuniformly Spaced Linear Arrays in Automotive Radar Sensors,” *IEEE Sens. J.*, vol. 24, no. 17, pp. 27737–27749, Sep. 2024, doi: 10.1109/JSEN.2024.342
 20. M. Wang, X. Qiu*, Z. Zhang, and S. Gao, “A domain adaptation framework for cross-modality SAR 3D reconstruction point clouds segmentation utilizing LiDAR data”, *Int. J. Appl. Earth Obs. Geoinf.*, vol. 133, p. 104103, Sep. 2024, doi: 10.1016/j.jag.2024.104103.
 21. Y. Wu, R. Song, Z. Zhang*, X. Qiu, and W. Yu, “GSAT-Net: An Azimuth Ambiguity Suppression Network Based on Group Sparsity and Adaptive Threshold for Undersampling SAR Imaging,” *IEEE Geosci. Remote Sens. Lett.*, vol. 21, pp. 1–5, 2024, doi: 10.1109/LGRS.2024.3452796.
 22. S. Gao, M. Wang, Z. Zhang*, B. Zhang, and Y. Wu, “Efficient gridless 2D DOA estimation based on generalized matrix-form atomic norm minimization,” *Electron. Lett.*, vol. 60, no. 10, p. e13212, May 2024, doi: 10.1049/ell2.13212..

23. Y. Zhao, C. Ou, H. Tian, B. W.-K. Ling, Y. Tian, and Z. Zhang*, "Sparse SAR Imaging Algorithm in Marine Environments Based on Memory-Augmented Deep Unfolding Network," *Remote Sens.*, vol. 16, no. 7, p. 1289, Apr. 2024, doi: 10.3390/rs16071289.
24. S. Gao, W. Wang, M. Wang, Z. Zhang*, Z. Yang, X. Qiu, B. Zhang, and Y. Wu, "A Robust Super-resolution Gridless Imaging Framework for UAV-borne SAR Tomography," *IEEE Trans. Geosci. Remote Sens.*, vol. 62, pp. 1–17, 2024, doi: 10.1109/TGRS.2024.3393972..
25. Z. Wang, Z. Wang, X. Qiu, and Z. Zhang*, "Global Polarimetric Synthetic Aperture Radar Image Segmentation with Data Augmentation and Hybrid Architecture Model," *Remote Sens.*, vol. 16, no. 2, p. 380, Jan. 2024, doi: 10.3390/rs16020380.
26. Y. Zhao, Q. Liu, H. Tian, B. W.-K. Ling, and Z. Zhang*, "DeepRED Based Sparse SAR Imaging," *Remote Sens.*, vol. 16, no. 2, p. 212, Jan. 2024, doi: 10.3390/rs16020212.
27. Y. Zhao, Q. Liu, H. Tian, M. Luo, B. W.-K. Ling, and Z. Zhang*, "New convex approaches to general MVDR robust adaptive beamforming problems," *Electron. Lett.*, vol. 59, no. 18, p. e12957, Sep. 2023, doi: 10.1049/ell2.12957.
28. Y. Bai, J. Kang, X. Ding, A. Zhang, Z. Zhang, and N. Yokoya, "LaMIE: Large-Dimensional Multipass InSAR Phase Estimation for Distributed Scatterers," *IEEE Trans. Geosci. Remote Sens.*, vol. 61, pp. 1–15, Nov. 2023, doi: 10.1109/TGRS.2023.3330971.
29. D. Zhao, Z. Zhang*, D. Lu, J. Kang, X. Qiu, and Y. Wu, "CVGG-Net: Ship Recognition for SAR Images Based on Complex-Valued Convolutional Neural Network," *IEEE Geosci. Remote Sens. Lett.*, vol. 20, pp. 1–5, 2023, doi: 10.1109/LGRS.2023.3316133.
30. M. Shao, Z. Zhang*, J. Li, J. Kang, and B. Zhang, "TADCG: A Novel Gridless Tomographic SAR Imaging Approach Based on the Alternate Descent Conditional Gradient Algorithm With Robustness and Efficiency," *IEEE Trans. Geosci. Remote Sens.*, vol. 62, pp. 1–13, 2024, doi: 10.1109/TGRS.2023.3345454.
31. Y. Wu, Z. Zhang*, X. Qiu, Y. Zhao, and W. Yu, "MF-JMoDL-Net: A Sparse SAR Imaging Network for Undersampling Pattern Design towards Suppressed Azimuth Ambiguity," *IEEE Trans. Geosci. Remote Sens.*, vol. 62, pp. 1–18, 2024, doi: 10.1109/TGRS.2024.3397826..
32. G. Zhou, Z. Xu, Y. Fan, Z. Zhang, X. Qiu, B. Zhang, K. Fu* and Y. Wu, "HPHR-SAR-Net: Hyper-pixel High-resolution SAR Imaging Network Based on Nonlocal Total Variation," *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.*, vol. 16, pp. 8595–8608, 2023, doi: 10.1109/JSTARS.2023.3295728.
33. M. Wang, Z. Zhang*, X. Qiu, S. Gao, and Y. Wang, "ATASI-Net: An Efficient Sparse Reconstruction Network for Tomographic SAR Imaging with Adaptive Threshold," *IEEE Trans. Geosci. Remote Sens.*, vol. 61, pp. 1–18, 2023, doi: 10.1109/TGRS.2023.3268132.
34. R. Shi, Z. Zhang*, X. Qiu, and C. Ding, "A Novel Gradient Descent Least-Squares (GDLs) Algorithm for Efficient Gridless Line Spectrum Estimation With Applications in Tomographic SAR Imaging," *IEEE Trans. Geosci. Remote Sens.*, vol. 61, pp. 1–13, 2023, doi: 10.1109/TGRS.2023.3273568.

35. J. Li, Z. Xu, Z. Li, Z. Zhang*, B. Zhang, and Y. Wu, “An Unsupervised CNN-Based Multichannel Interferometric Phase Denoising Method Applied to TomoSAR Imaging,” *IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.*, vol. 16, pp. 3784–3796, Jul. 2023, doi: 10.1109/JSTARS.2023.3263964.
36. Y. Zhao, Y. Chen, H. Tian, X. Quan, B. W.-K. Ling, and Z. Zhang*, “Wide angle SAR imaging method based on hybrid representation,” *Electron. Lett.*, vol. 59, no. 15, p. e12897, Aug. 2023, doi: 10.1049/ell2.12897.
37. P. Jiang, Z. Zhang*, B. Zhang, and Z. Xu, “A novel TomoSAR imaging method with few observations based on nested array,” *IET Radar, Sonar Navig.*, vol. 17, no. 6, pp. 925–938, Jun. 2023, doi: 10.1049/rsn2.12388.
38. J. Kang*, T. Ji, Z. Zhang, and R. Fernandez-Beltran, “SAR Time Series Despeckling via Nonlocal Matrix Decomposition in Logarithm Domain,” *Signal Processing*, vol. 209, p. 109040, Aug. 2023, doi: 10.1016/j.sigpro.2023.109040.
39. 康健 *, 童风雨, 白雨松, 丁翔, 冀腾宇, and 张柘 *, “基于对数域加性信号分解的时序 SAR 图像相干斑抑制方法,” *雷达学报*, vol. 12, no. 5, pp. 1031–1043, Mar. 2023, doi: 10.12000/JR22242.
40. X. Ding, J. Kang*, Z. Zhang, Y. Huang, J. Liu, and N. Yokoya, “Coherence-Guided Complex Convolutional Sparse Coding for Interferometric Phase Restoration,” *IEEE Trans. Geosci. Remote Sens.*, vol. 60, pp. 1–14, 2022, doi: 10.1109/TGRS.2022.3228279.
41. Z. Zhu, J. Kang*, T. Ji, Z. Zhang, and R. Fernandez-Beltran, “SAR Time-Series Despeckling via Nonlocal Total Variation Regularized Robust PCA,” *IEEE Geosci. Remote Sens. Lett.*, vol. 19, pp. 1–5, 2022, doi: 10.1109/LGRS.2022.3227187.
42. Y. Zhao, W. Huang, X. Quan, W.-K. Ling, and Z. Zhang*, “Data-driven sampling pattern design for sparse spotlight SAR imaging,” *Electron. Lett.*, vol. 58, no. 24, pp. 920–923, Nov. 2022, doi: 10.1049/ELL2.12650.
43. Z. Xu, B. Zhang, Z. Zhang*, M. Wang, and Y. Wu, “Nonconvex-Nonlocal Total Variation Regularization Based Joint Feature-Enhanced Sparse SAR Imaging,” *IEEE Geosci. Remote Sens. Lett.*, vol. 19, pp. 1–1, 2022, doi: 10.1109/lgrs.2022.3222185.
44. 吕泽鑫, 仇晓兰 *, 张柘, and 丁赤飏, “极化干涉 SAR 面向城区不同处理模式的误差影响分析,” *雷达学报*, 2022, doi: 10.12000/JR22059.
45. Z. Xu, G. Zhou, B. Zhang, Z. Zhang* and Y. Wu, “Sparse Regularization Method Combining SVA for Feature Enhancement of SAR Images,” *Electronics Letters*, Jun. 2022, doi: 10.1049/ell2.12509.
46. 赵曜, 许俊聪, 全相印, 崔莉, and 张柘 *, “基于稀疏和低秩结构的层析 SAR 成像方法,” *雷达学报*, vol. 11, no. 1, pp. 52–61, 2022.
47. 杜邦, 仇晓兰, 张柘, 雷斌, and 丁赤飏, “基于扰动的结合 Off-grid 目标的层析 SAR 三维成像方法,” *雷达学报*, vol. 11, no. 1, pp. 62–70, 2022.
48. Z. Zhang*, B. Zhang, C. Jiang, X. Liang, L. Chen, W. Hong and Y. Wu, “The First Airborne Experiment of Sparse Microwave Imaging: Prototype System Design and Result Analysis,” Available: <http://arxiv.org/abs/2110.10675>.
49. Z. Zhang*, Y. Wang, and Z. Tian, “Efficient Two-Dimensional Line Spectrum Estimation Based on Decoupled Atomic Norm Minimization,” *Signal Processing*, Vol. 163, pp. 95–106, 2019.

50. 张柘*, 张冰尘, 洪文, and 吴一戎, “结合 MD 自聚焦算法与回波模拟算子的快速稀疏微波成像误差补偿算法,” 雷达学报, vol. 5, no. 1, pp. 25-34, 2016.
51. B. Zhang, Z. Zhang*, C. Jiang, Y. Zhao, W. Hong and Y. Wu, “System Design and First Airborne Experiment of Sparse Microwave Imaging Radar: Initial Results,” Science China Information Sciences (Series F), vol. 58, no. 6, 2015.
52. 蒋成龙, 赵曜, 张柘, 张冰尘, and 洪文, “基于相关系数的稀疏微波成像方位向采样优化方法,” 电子与信息学报, vol. 37, no. 3, 2015.
53. 吴一戎, 洪文, 张冰尘, 蒋成龙, 张柘, and 赵曜, “稀疏微波成像研究进展 (科普类),” 雷达学报, vol.3, no. 4, pp. 383-395, 2014.
54. C. Jiang*, B. Zhang, J. Fang, Z. Zhang, W. Hong, Y. Wu and Z. Xu, “An efficient Lq regularization algorithm with range-azimuth decoupled for SAR imaging,” Electronics Letters, vol. 50, no. 3, pp. 204-205, 2014.
55. Z. Zhang*, B. Zhang, C. Jiang, Y. Xiang, W. Hong, and Y. Wu, “Influence factors of sparse microwave imaging radar system performance: approaches to waveform design and platform motion analysis,” Science China Information Sciences (Series F), vol. 55, no. 10, pp. 2301-2317, 2012.
56. C. Jiang*, B. Zhang, Z. Zhang, W. Hong, and Y. Wu, “Experimental results and analysis of sparse microwave imaging from spaceborne radar raw data,” Science China Information Sciences (Series F), vol. 55, no. 8, pp. 1801-1815, 2012.
57. 谢敏, 乔瑞萍, 潘志斌, 李东平, 乔阳, and 张柘, “一种改进的绝对误差不等式删除算法在 DM642 上的实现,” 微电子学与计算机, vol. 27, no. 4, pp. 182-185, 2010.
58. T. Wang*, R. Qiao, Z. Pan, D. Li, Y. Qiao, F. Gao and Z. Zhang, “Research and Application of Vector Quantization Algorithm Based on DM642”, in Proceedings of 2008 TI DSP Contest, pp. 143-161, Publishing House of Electronics Industry, Beijing, 2008, in Chinese.

KEYNOTES / INVITED TALKS

1. 张柘*, “无网格稀疏信号处理及其在微波成像中的应用”, in 当稀疏信号处理技术遇见雷达研讨会, Nanjing, 2021, *invited*.
2. 张柘*, “基于深度神经网络隐式约束的 SAR 微波视觉三维成像方法”, in 第四届雷达未来大会雷达与微波视觉分论坛暨第四期雷达学报大讲堂, Xi'an, 2024, *invited*.
3. 张柘*, “基于微波视觉与多径利用的低空 SAR 城市三位建筑布局重构研究”, in 第二届雷达与信号处理技术及应用大会, Nanjing, 2024, *invited*.
4. Z. Zhang*, “SAR Imaging Methods based on Microwave Vision”, in 2024 IEEE International Conference on Signal, Information and Data Processing (IC-SIDP), Zhuhai, 2024, *invited*.
5. 张柘*, “基于微波视觉的微波智能三维成像理论与方法”, in 第一届微波成像技术学术会议, Sanya, 2025, *invited*.
6. 张柘*, “星载合成孔径雷达智能成像新体制：认知成像与智能感知一体化”, in CCF 普适计算专委会“泛在中国行”系列活动——苏州独墅湖数据智能论坛与战略研讨, Suzhou, 2025, *invited*.

7. 张柘 *, “穿越空间的微波之眼”, in “科学与中国——千名院士·千场科普” 格致论道, Changsha, 2025, *invited*.

INVITED PEER-REVIEWED CONFERENCE PAPERS

1. Z. Zhang*, M. Jian, Z. Lu, H. Chen, S. James, C. Wang. and R. Gentile, “Embedded Micro Radar for Pedestrian Detection in Clutter”, in IEEE International Radar Conference (RADAR 2020), 2020, *invited*.
2. Z. Zhang*, B. Zhang, W. Hong, H. Bi and Y. Wu, “SAR Imaging of Moving Target in a Sparse Scene Based on Sparse Constraints: Preliminary Experiment Results,” in 2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2015), *invited*.
3. W. Hong, B. Zhang, Z. Zhang*, C. Jiang, Y. Zhao and Y. Wu, “Radar Imaging with Sparse Constraint: Principle and Initial Experiment,” in 10th European Conference on Synthetic Aperture Radar (EuSAR 2014), *invited*.

PEER-REVIEWED CONFERENCE PAPERS

1. H. Huang, W. Li, H. Li, Y. Zhu, D. Lu, and Z. Zhang, “SARRSD: large-scale microwave radar remote sensing mapping-type and recognition-type object detection dataset,” in Second Conference of Young Scientists of the Chinese Society of Optical Engineering, L. Cao, Q. Zhang, P. Hu, and L. Liu, Eds., SPIE, Sep. 2025, p. 105. doi: 10.1117/12.3073531.
2. Y. Zhao, K. Liu, D. Lu, and Z. Zhang, “A multimodal remote sensing image fusion method for object detection based on tensor decomposition,” in Second Conference of Young Scientists of the Chinese Society of Optical Engineering, L. Cao, Q. Zhang, P. Hu, and L. Liu, Eds., SPIE, Sep. 2025, p. 100. doi: 10.1117/12.3073498.
3. F. Gong, C. Wang, D. Lu, H. Li, and Z. Zhang*, “Research on precise positioning method of low-altitude targets based on DOA estimation,” in Second Conference of Young Scientists of the Chinese Society of Optical Engineering, L. Cao, Q. Zhang, P. Hu, and L. Liu, Eds., SPIE, Sep. 2025, p. 211. doi: 10.1117/12.3075320.
4. Y. Wu, Z. Zhang*, R. Song, X. Qiu, and W. Yu, “Azimuth Ambiguity Suppression for Sparse SAR Imaging Based on Unfolded Deep Network,” Proc. Eur. Conf. Synth. Aperture Radar, EUSAR, pp. 526–530, 2024.
5. A. Wang, M. Shang, X. Qiu, and Z. Zhang*, “L2 Regularized Reconstruction Matched Filter for Azimuth Multichannel SAR ,” in IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium, IEEE, Jul. 2024, pp. 1173–11176. doi: 10.1109/igarss53475.2024.10641476.
6. M. Wang, X. Qiu, S. Gao, and Z. Zhang, “LiDAR-to-SAR Point Cloud Segmentation via Unsupervised Domain Adaptation Network,” in IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium, IEEE, Jul. 2024, pp. 10808–10812. doi: 10.1109/igarss53475.2024.10641953.

7. H. Yang, Z. Huang, and Z. Zhang, "Interpretable Attributed Scattering Center Extracted via Deep Unfolding," in *IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, Jul. 2024, pp. 2004–2008. doi: 10.1109/igarss53475.2024.10641709.
8. Y. Wu, Z. Zhang*, X. Qiu, Y. Zhao, W. Yu, and R. Song, "An efficient azimuth sampling design network for sparse SAR imaging," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 2994–2998. doi: 10.1049/icp.2024.1570.
9. G. Zhou, Z. Xu, Y. Fan, Z. Zhang, B. Zhang*, and Y. Wu, "Deep unfolding network for sparse SAR imaging based on compound regularization," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 3536–3540. doi: 10.1049/icp.2024.1673.
10. Z. Wang, Z. Wang, X. Qiu, and Z. Zhang*, "End-to-end global segmentation of PolSAR images with data augmentation," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 1816–1820. doi: 10.1049/icp.2024.1359.
11. M. Wang, S. Gao, Z. Zhang*, and X. Qiu, "An autofocus network for multi-channel phase errors with application to tomoSAR imaging," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 3045–3050. doi: 10.1049/icp.2024.1580.
12. S. Gao, M. Wang, Z. Zhang*, B. Zhang, and Y. Wu, "Gridless DOA estimation for automotive radars with various array geometries: the non-Vandermonde atomic soft thresholding approach," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 2068–2073. doi: 10.1049/icp.2024.1406.
13. M. Shao, C. Su, Z. Zhang*, and B. Zhang, "The application of the alternate descent conditional gradient method in tomographic SAR off-grid imaging," in *IET International Radar Conference (IRC 2023)*, Institution of Engineering and Technology, 2023, pp. 3259–3264. doi: 10.1049/icp.2024.1622.
14. M. Wang, S. Gao, Z. Zhang*, and X. Qiu, "A Novel Multi-Channel Phase Error Estimation Method Based On Stochastic Optimization For Tomographic SAR Autofocusing," in *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*, Jul. 2023, pp. 7953–7956. doi: 10.1109/IGARSS52108.2023.102829
15. T. Chen, Y. Meng, G. Zhou, Z. Zhang, B. Zhang, and Y. Wu, "An Improved Imaging Method for Highly-Squinted SAR Based on Hyper-Optimized ADMM," in *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*, Jul. 2023, pp. 4548–4551. doi: 10.1109/IGARSS52108.2023.10281842.
16. P. Jiang, Z. Zhang*, and B. Zhang, "Efficient Sparse MIMO SAR Imaging with Fast Iterative Method Based on Back Projection and Approximated Observation," in *2022 5th International Conference on Electronics and Electrical Engineering Technology (EEET)*, Dec. 2022, pp. 34–40. doi: 10.1109/EEET58130.2022.00014.
17. S. Gao, Z. Zhang*, B. Zhang, and Y. Wu, "Gridless tomographic SAR imaging based on accelerated atomic norm minimization with efficiency," in *International Conference on Radar Systems (RADAR 2022)*, 2022, pp. 48–53. doi: 10.1049/icp.2022.2290.

18. M. Wang, Z. Zhang*, Y. Wang, S. Gao, and X. Qiu, “TomoSAR-ALISTA: Efficient TomoSAR imaging via deep unfolded network,” in *International Conference on Radar Systems (RADAR 2022)*, 2022, pp. 528–533. doi: 10.1049/icp.2023.1289.
19. Z. Xu, G. Zhou, B. Zhang, Z. Zhang, and Y. Wu, “An Accurate Sparse SAR Imaging Method for Joint Feature Enhancement Based on Nonconvex-Nonlocal Total Variation Regularization,” in *14th European Conference on Synthetic Aperture Radar (EUSAR 2022)*, 2022, pp. 576–581. [Online]. Available: <https://ieeexplore.ieee.org/document/9944320>.
20. M. Liu, J. Li, Z. Zhang, B. Zhang, and Y. Wu, “Azimuth Ambiguities Suppression for Multichannel SAR Imaging Based on L2,q Regularization: Initial Results of Non-sparse Scenario,” in *International Geoscience and Remote Sensing Symposium (IGARSS) 2021*, 2021, pp. 3153–3156.
21. B. Du, Z. Zhang, X. Qiu, B. Lei, and C. Ding, “Multi-aspect Tomographic SAR Imaging Approach via Distributed Compressed Sensing and Joint Sparsity,” in *CIE Radar Conference 2021*, 2021, pp. 2–5.
22. Z. Wang, X. Lin, X. Xiang, Z. Zhang, Z. Tian, K. Pham, E. Blasch and G. Chen, “A hidden chamber detector based on a MIMO SAR”, in *Proc. SPIE 11017, Sensors and Systems for Space Applications XII*, 1101706, 2019.
23. P.Xu, Z. Tian, Z. Zhang and Y. Wang, “COKE: Communication-Censored Kernel Learning via random features”, in the *2019 IEEE Data Science Workshop (DSW 2019)*, 2019.
24. Z. Zhang, X. Chen and Z. Tian*, “A Hybrid Neural Network Framework and Application to Radar Automatic Target Recognition”, in the *6th IEEE Global Conference on Signal and Information Processing (GlobalSIP 2018)*, 2018.
25. Z. Zhang and Z. Tian*, “ANM-PhaseLift: Structured Line Spectrum Estimation from Quadratic Measurements”, in *7th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP 2017)*, 2017.
26. Z. Tian, Z. Zhang* and Y. Wang, “Low-complexity optimization for Two-Dimensional Direction-of-arrival Estimation via Decoupled Atomic Norm Minimization”, in *42th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2017)*, 2017.
27. Z. Zhang*, Z. Tian, B. Zhang, W. Hong, W. Hong and L. Li, “Multi-channel SAR Covariance Matrix Estimation Based on Compressive Covariance Sensing”, in *4th International Workshop on Compressive Sensing Theory and its Applications to Radar, Sonar and Remote Sensing (CoSeRa 2016)*, 2016.
28. C. Jiang*, Y. Lin, Z. Zhang, B. Zhang and W. Hong, “WASAR Imaging based on message passing with structured sparse constraint: approach and experiment”, in *3th International Workshop on Compressive Sensing Theory and its Applications to Radar, Sonar and Remote Sensing (CoSeRa 2015)*, 2015.
29. X. Quan*, C. Jiang, Z. Zhang, B. Zhang and Y. Wu, “A Study of BP-CAMP Algorithm for SAR Imaging,” in *2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2015)*, 2015.
30. X. Quan*, Z. Zhang, C. Jiang, B. Zhang and Y. Wu, “Comparison of Several Sparse Reconstruction Algorithms in SAR Imaging,” in *IET International Radar Conference 2015*, 2015.

31. W. Wang*, B. Zhang, W. Hong, Z. Zhang, Y. Zhao, C. Jiang and H. Bi, "Polarimetric SAR Tomography of Forested Areas Based on Compressive MUSIC," in 2014 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2014), 2014.
32. Z. Zhang*, Y. Zhao, C. Jiang, B. Zhang, W. Hong and Y. Wu, "Initial Analysis of SNR / Sampling Rate Constraints in Compressive Sensing based Imaging Radar," in 2nd Workshop on Compressive Sensing Applied to Radar (CoSeRa 2013), 2013.
33. B. Zhang, C. Jiang*, Z. Zhang, J. Fang, Y. Zhao, W. Hong, Y. Wu and Z. Xu, "Azimuth Ambiguity Suppression for SAR Imaging based on Group Sparse Reconstruction", in Workshop on Compressive Sensing Applied to Radar (CoSeRa 2013), 2013.
34. Z. Zhang*, Y. Zhao, C. Jiang, B. Zhang, W. Hong and Y. Wu, "Autofocus of Sparse Microwave Imaging Radar Based on Phase Recovery," in 2nd IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC 2013), 2013.
35. Z. Zhang*, B. Zhang, W. Hong, and Y. Wu, "Waveform Design for Lq Regularization Based Radar Imaging and An Approach to Radar Imaging with Non-moving Platform," in 9th European Conference on Synthetic Aperture Radar (EuSAR 2012), 2012.
36. B. Zhang, Z. Zhang*, W. Hong, and Y. Wu, "Applications of Distributed Compressive Sensing in Multi-channel Synthetic Aperture Radar," in 1st Workshop on Compressive Sensing Applied to Radar (CoSeRa 2012), 2012.

PATENTS

1. 商明样, 王骛巍, 张柘, 王纯一, and 吕旖旎, "一种基于 L2 正则的方位多通道 SAR 非均匀采样重构方法及系统," CN202510493241.2.
2. 张柘 *, 余佳童, 马梓瑞, 傅世平, 陈宇凡, 王纯一, and 吕旖旎, "一种基于深度展开网络的 SAR 稀疏成像方法与系统," CN202510486386.X.
3. 张柘 *, 吴雨微, 王纯一, 商明样, and 傅世平, "一种基于深度学习的 SAR 方位向欠采样成像方法与系统," CN202510471949.8.
4. 商明样, 顾杨钧, and 张柘, "一种面向超高分辨率星载 SAR 图像的自适应量化方法及系统," CN202510115690.3.
5. 马梓瑞, 张冰尘, 吕旖旎, and 张柘, "稀疏合成孔径雷达成像方法、装置、设备、介质及产品," CN202510516768.2.
6. 铁雯婕, 卢东东, 李杭, 张柘, and 李翀, "一种面向运动模糊和雾霾影响的光学图像质量盲评价方法及系统," CN202411939598.0.
7. 仇晓兰, 王沐涵, 高四琳, 罗一通, 张柘, and 焦泽坤, "一种基于微波视觉的阵列干涉 SAR 误差估计方法与装置," ZL202411777220.5.
8. 施睿哲, 罗一通, 张柘, and 仇晓兰, "基于嵌套的三维 SAR 天线阵列设计方法与应用," CN202411175663.7.
9. 徐仲秋, 张冰尘, 蒋鹏宇, 张柘, and 吴一戎, "基于非凸-非局部全变差正则化的稀疏 SAR 成像方法及系统," ZL202111402837.5.

10. 张柘 *, 赵曜, 张冰尘, 洪文 and 吴一戎, “一种基于相位恢复的机载稀疏微波成像自聚焦方法,” ZL201310737404.4.
11. 张柘 *, 张冰尘, 洪文, 吴一戎 and 全相印, “一种基于 PhaseLift 的稀疏微波成像自聚焦方法,” ZL201510227896.1.
12. 张冰尘, 洪文, 吴一戎 and 张柘, “装载于慢速平台上的成像雷达的稀疏微波成像方法及装置,” ZL201510227896.1.
13. 全相印, 张冰尘, 蒋成龙, 赵曜, 张柘 and 吴一戎, “一种基于稀疏度估计的分维度阈值迭代稀疏微波成像方法,” ZL201410497525.0.
14. 吴一戎, 全相印, 张冰尘 and 张柘, “基于正则化的偏置相位中心天线成像方法,” ZL201610202747.4.