Xiao Wu

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Ｇ Google Scholar (citations: 420+)

Education

Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) *Visiting Student in Computer Vision*
Advisor: Prof. Yutong Xie   *2025.01-2026.10*

University of Electronic Science and Technology of China (UESTC) *Ph.D. in Mathematics*
Advisor: Prof. Ting-Zhu Huang and Prof. Liang-Jian Deng   *2023.09-2027.06*
Driving force of the team | Key team member

University of Electronic Science and Technology of China (UESTC) *M.Sc. in Artificial Intelligence*
Advisor: Prof. Ting-Zhu Huang and Prof. Liang-Jian Deng   *2020.09-2023.06*
Driving force of the team | Key team member

Chongqing University of Posts and Telecommunications *B.Sc. in Intelligent Science and Technology*
Laboratory: Chongqing Key Laboratory of Computational Intelligence   *2015.09-2019.06*
Advisor: Yucheng Shu
Student team leader

Research Experience

West China Second University Hospital, Sichuan University   2021.08-2021.12
Research Intern
- Cardiac CT image segmentation using nnUnet-based method
- Multimodal fusion of cardiac CT images

Water Cube3d   2020.03-2020.07
Research Intern
- Integrated image segmentation techniques into virtual reality programs and their installations
- Force estimation in 3D skeletal models

Laboratory of Computational Intelligence   2017.07-2019.07
Research Intern
- Medical image segmentation: weak-supervised learning, deformable convolution network, and edge-aware Techniques
- One paper was accepted by MICCAI 2019

Research Interest: Deep Learning and Mathematics

- Machine Learning: Deep unfolding, deep equilibrium models, self-supervised learning, neural operators (PINNs, Neural ODEs, and INRs)
- Computational Imaging: Inverse problems (e.g., super-resolution, fusion, image enhancement & restoration), tensor/sparse modeling
- Generative AI: Diffusion models (DDPM, SDE), GANs, and their applications in vision
- Medical AI: Medical image analysis, vision-language models, and AI agent systems for computer-aided diagnosis and prognosis

Publications

- **Xiao Wu**, Ting-Zhu Huang, Liang-Jian Deng, Yanyuan Qiao, Imran Razzk, Yutong Xie. A Knowledge-driven Adaptive Collaboration of LLMs for Enhancing Medical Decision-making. The 2025 Conference on Empirical Methods in Natural Language Processing (***EMNLP***).

- **Xiao Wu**, Ting-Zhu Huang, Liang-Jian Deng, Zhong-Cheng Wu. A Robust Tensor Wheel Decomposition-Based Regularization method and Its Application to Image Completion. Journal of Scientific Computing (***JSC***).

- **Xiao Wu**, Zihan Cao, Ting-Zhu Huang, Liang-Jian Deng, Jocelyn Chanussot, Gemine Vivone. Fully-Connected Transformer for Multi-Source Image Fusion. IEEE Transactions on Pattern Analysis and Machine Intelligence (***TPAMI***), 2025.

- Gemine Vivone, Liang-Jian Deng, Dan-Feng Hong, Wei Li, Huanfeng Shen, **Xiao Wu**, el al. Deep Learning in Remote Sensing Image Fusion: Methods, Protocols, Data and Future Perspectives. IEEE Geoscience and Remote Sensing Magazine (***GRSM***), 2025. (**Review)**

- Yu Zhong[1], **Xiao Wu**[1], Zihan Cao, Hong-Xia Dou, Liang-Jian Deng. SSDiff: Spatial-spectral Integrated Diffusion Model for Remote Sensing Pansharpening. Conference on Neural Information Processing Systems (***NeurIPS***), 2024. (**Poster)** ([1] denotes the equal contribution)

- Zihan Cao[1], **Xiao Wu**[1], Liang-Jian Deng, Yu Zhong. A Novel State Space Model with Local Enhancement and State Sharing for Image Fusion. Proceedings of the ACM International Conference on Multimedia (***ACM MM***), 2024. (**Poster)**

- Yule Duan[1], **Xiao Wu**[1], Haoyu Deng, Liang-Jian Deng. Content-Adaptive Non-Local Convolution for Remote Sensing Pansharpening. Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (***CVPR***), 2024.

- **Xiao Wu**, Ting-Zhu Huang, Liang-Jian Deng, Tian-Jing Zhang. A Decoder-free Transformer-like Architecture for High-efficiency Single Image Deraining. International Joint Conferences on Artificial Intelligence (***IJCAI***), 2022. (**Long Oral, 3.7%)**

- **Xiao Wu**, Ting-Zhu Huang, Liang-Jian Deng, Tian-Jing Zhang. Dynamic Cross Feature Fusion for Remote Sensing Pansharpening. Proceedings of the IEEE/CVF International Conference on Computer Vision (***ICCV***), 2021. (**Poster)**

- Yucheng Shu, **Xiao Wu**, Weisheng Li. LVC-Net: Medical image segmentation with noisy label based on local visual cues. International Conference on Medical Image Computing and Computer-Assisted Intervention (***MICCAI, first author (excluding supervisor)***), 2019. (**Early Accept)**

- Haoyu Deng, Zijing Xu, Yule Duan, **Xiao Wu**, Wen-Jie Shu, Liang-Jian Deng. Exploring the Low-Pass Filtering Behavior in Image Super-Resolution. International Conference on Machine Learning (***ICML***), 2024.

- Zihan Cao, **Xiao Wu**, Liang-Jian Deng, Gemine Vivone. Neural Shrödinger Bridge Matching for Pansharpening. Inverse Problems and Imaging (***IPI***), 2025.

- Wen-Jie Shu, Hong-Xia Dou, Rui Wen, **Xiao Wu**, Liang-Jian Deng. CMT: Cross Modulation Transformer with Hybrid Loss for Pansharpening. IEEE Geoscience and Remote Sensing Letters (***GRSL***), 2024.

- Ran Ran, Liang-Jian Deng, **Xiao Wu**, Tian-Jing Zhang, Jian-Long Chang Qi-Tian. KNLConv: Kernel-space Non-local Convolution for Hyperspectral Image Super-resolution. IEEE Transactions on Multimedia (***TMM***), 2024.

- Zihan Cao, Shiqi Cao, Liang-Jian Deng, **Xiao Wu**, Junming Hou, Gemine Vivone. Diffusion model with disentangled modulations for sharpening multispectral and hyperspectral images. Information Fusion, 2023.

- Jun-Da Wang, Liang-Jian Deng, Chen-Yu Zhao, **Xiao Wu**, Hong-Ming Chen, Gemine Vivone. Cascadic Multi-Receptive Learning for Multispectral Pansharpening. IEEE Transactions on Geoscience and Remote Sensing (***TGRS***), 2023.
- Siran Peng, Chenhao Guo, **Xiao Wu**, Liang-Jian Deng. U2Net: A General Framework with Spatial-Spectral-Integrated Double U-Net for Image Fusion. Proceedings of the ACM International Conference on Multimedia (***ACM MM***), 2023.
- Shang-Qi Deng, Liang-Jian Deng, **Xiao Wu**, Ran Ran, Rui Wen. Bidirectional Dilation Transformer for Multispectral and Hyperspectral Image Fusion. International Joint Conferences on Artificial Intelligence (***IJCAI***), 2023.
- Jin-Liang Xiao, Ting-Zhu Huang, Liang-Jian Deng, Zhong-Chen Wu, **Xiao Wu**, Gemine Vivone. Variational pansharpening based on coefficient estimation with nonlocal regression. IEEE Transactions on Geoscience and Remote Sensing (***TGRS***), 2023.
- Xue-Rui Qiu[1], Zhao-Rui Wang[1], Zheng Luan[1], Rui-Jie Zhu, **Xiao Wu**, Ma-Lu Zhang, Liang-Jian Deng. VTSNN: A Virtual Temporal Spiking Neural Network. Frontiers in Neuroscience, 2023.
- Rui Wen, Liang-Jian Deng, Zhong-Cheng Wu, **Xiao Wu**, Gemine Vivone. A Novel Spatial Fidelity with Learnable Nonlinear Mapping for Panchromatic Sharpening. IEEE Transactions on Geoscience and Remote Sensing (***TGRS***), 2023.
- Shang-Qi Deng, Liang-Jian Deng, **Xiao Wu**, Ran Ran, Dan-Feng Hong, Gemine Vivone. PSRT: Pyramid Shuffle-and-Reshuffle Transformer for Multispectral and Hyperspectral Image Fusion. IEEE Transactions on Geoscience and Remote Sensing (***TGRS***), 2023.
- Liang-Jian Deng, Ran Ran, **Xiao Wu**, Tian-Jing Zhang. Research progress on convolutional neural network methods for pan-sharpening of remote sensing images. Chinese Journal of Image and Graphics, 2022. (**Review**)
- Zhi-Xuan Chen[1], Cheng Jin[1], Tian-Jing Zhang, **Xiao Wu**, Liang-Jian Deng. SpanConv: A New Convolution via Spanning Kernel Space for Lightweight Pansharpening. International Joint Conferences on Artificial Intelligence (***IJCAI***), 2022. (**Long Oral, 3.7%**)
- Yudong Wang, Liang-Jian Deng, Tian-Jing Zhang, **Xiao Wu**. SSconv: Explicit Spectral-to-Spatial Convolution for Pansharpening. Proceedings of the ACM International Conference on Multimedia (***ACM MM***), 2021. (**Poster**)
- Cheng Jin, Rui-Jie Zhu, **Xiao Wu**, Liang-Jian Deng. SIT: A Bionic and Non-Linear Neuron for Spiking Neural Network. Arxiv, 2022.

Projects

- Pytorch Toolbox
  - UDL-VIS (A unified AutoDL framework for computer vision):
    * Faster library loading speed based on reflection mechanism
    * UDL is based on MMCV which provides various functionalities
    * UDL is based on NNI to perform automatic machine learning
    * UDL provides distributed training based on Accerlerate (huggingface) and Pytorch implementation
  - PanCollection (Public remote sensing image pansharpening dataset and toolbox)
  - Image deraining
  - Multi-source image fusion (Multispectral-visible, multispectral-hyperspectral, visible-infrared image fusion) is coming soon
    * The first edition has been released

- MATLAB Toolbox
  - [Tensor decomposition](#)
  - Toolbox for multi-source image fusion benchmark is coming soon

Academical Activities

- Conference Reviewer
  - PC member: AAAI 2025-2026, IGRASS 2025
  - ICLR 2025-2026, AISTATS 2025-2026, NeurIPS 2024-2025, ICML 2024-2025 IJ-CAI 2024, CVPR 2024-2025, ICCV 2023-2025, ACM MM 2024, MICCAI 2023-2025, ...
- Journal Reviewer
  - IEEE TPAMI, IEEE TIP, IEEE TNNLS, IEEE TMI, PR, Inf. Fus., IEEE TGRS, ...
- Presentation
  - ICCV 2021, IJCAI 2022, IJCAI 2023

Selected Honors & Awards

Special Postgraduate Scholarship of Science

Best Master Thesis Award

Best Bachelor Thesis Award

Academic Scholarship

Third Prize · National Huawei Cup Graduate Mathematical Modeling Competition

Third Prize · National Discovery Cup

Leader · Undergraduate Innovation and Entrepreneurship Training Program in Provinces

Skills

Programming Language: Python (Pytorch, TensorFlow, and Keras) with 8 years, Matlab, C, CUDA
Tools: Linux, Docker, Slurm, Latex, Origin, etc.
Language: Mandarin, English (CET-6)

Hobby

Photography📷, party games🎲, travel🌍, and fitness💪.