LIU WEIDE

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SUMMARY

Weide Liu is a **Full Professor** at **Jiangxi University of Finance and Economics (JUFE)**, China. He previously served as a **Research Fellow** at **Harvard Medical School**, Harvard University, and at **Nanyang Technological University (NTU)**, Singapore, and has also worked as a **Research Scientist** at **A*STAR** and **ByteDance AI Lab**. He received his **B.Eng.** degree in Electrical and Electronic Engineering and his **Ph.D.** degree in Computer Science, both from **Nanyang Technological University (NTU)**, Singapore.

His research interests include artificial intelligence for imaging neuroscience, medical image analysis, multimedia content understanding, and machine learning methodology. Dr. Liu's work has been published in premier venues such as CVPR, ICCV, ECCV, IJCV, and IEEE TIP, and he received a **Best Paper Award** at the 4th International Workshop on Deep Learning for Human Activity Recognition at IJCAI (as First Author).

He has served as Associate Editor for *Signal, Image and Video Processing* and the *Journal of Visual Communication and Image Representation*, Track Chair for IECON 2023, and Special Issue Chair for ICIP 2024–2026 and ICME 2025–2026. He is also a recipient of the **DAAD AInet Fellowship 2024** (AI for Science).

RESEARCH INTERESTS

Image processing and computer vision, with an emphasis on learning-based image and video analysis, including image segmentation, restoration, enhancement, and representation learning. Specific interests include data-efficient and weakly supervised learning, uncertainty-aware and trustworthy image processing, image quality assessment and perceptual modeling, and geometric and multi-view vision. The research focuses on methodological advances with broad applicability across natural, multimedia, and biomedical images.

EDUCATION

Nanyang Technological University (NTU), Singapore *August 2018 - June 2022*
Doctor of Philosophy, School of Computer Science and Engineering

Nanyang Technological University (NTU), Singapore *July 2012 - June 2016*
Bachelor of Engineering, Electrical and Electronic Engineering. Full Scholarship (Nanyang Scholarship).

WORK EXPERIENCE

Full Professor, Jiangxi University of Finance and Economics Jan 2026 - Present

- Leading research in artificial intelligence for imaging neuroscience, medical image analysis, and AI for Science, with a particular focus on motion-robust fetal and neonatal brain imaging.
- Establishing interdisciplinary collaborations and supervising graduate students and young researchers in computer vision, biomedical engineering, and time-series AI.
- Supporting the development of AI-related curricula, research platforms, and talent programs to advance JUFE's strategic directions in AI and digital innovation.

Research Fellow, Nanyang Technological University (NTU) May 2025 - Dec 2025

· Conducted research on machine learning for biomedical imaging and time-series analysis, including uncertainty-aware, federated, and domain-adaptation methods for medical and industrial data.
· Collaborated with clinical and industrial partners and co-supervised graduate students on projects in computer vision, and multimedia understanding.

Research Fellow, Harvard Medical School, Harvard University Jan 2024 - May 2025

· Advanced AI for imaging neuroscience by developing motion-robust fetal and neonatal brain imaging techniques, including machine-learning-based tractography and cross-modality registration for in utero and early-life assessments.
· Worked closely with clinicians and imaging scientists to translate methodological advances into practical tools for studying early brain development and improving clinical decision support.

Research Scientist, Agency for Science, Technology and Research (A*STAR) Aug 2021 - Jan 2024

· Developed methods for video segmentation, weakly supervised segmentation, 3D point cloud analysis, few-shot learning, long-tail recognition, and multimodal recognition.
· Led and contributed to collaborative research projects with academic and industry partners, resulting in publications in top-tier computer vision and multimedia venues.

SELECTED PAPERS

Learning with Less Annotation

1. **Weide Liu**, Chi Zhang, Guosheng Lin, Fayao Liu, "CRCNet: Few-shot Segmentation with Cross-Reference and Region-Global Condition Networks," *International Journal of Computer Vision*, vol. 130, no. 12, pp. 3140–3157, 2022. DOI: 10.1007/s11263-022-01677-7. (Top Journal, IF: 19.5)

2. **Weide Liu**, Zhonghua Wu, Yang Zhao, Yuming Fang, Chuan-Sheng Foo, Jun Cheng, Guosheng Lin, "Harmonizing Base and Novel Classes: A Class-Contrastive Approach for Generalized Few-Shot Segmentation," *International Journal of Computer Vision*, vol. 132, no. 4, pp. 1277–1291, April 2024. DOI: 10.1007/s11263-023-01939-y. (Top Journal, IF: 19.5)

3. **Weide Liu**, Chi Zhang, Guosheng Lin, Fayao Liu, "CRNet: Cross-Reference Networks for Few-Shot Segmentation," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, pp. 4165–4173. (Acceptance rate: 22%)

4. **Weide Liu**, Xiangfei Kong, Guosheng Lin, Tzu-Yi Hung, "Cross-Image Region Mining with Region Prototypical Network for Weakly Supervised Segmentation," *IEEE Transactions on Multimedia*, vol. 25, pp. 1148–1160, 2023. DOI: 10.1109/TMM.2021.3139459. (Top Journal, IF: 7.3)

5. **Weide Liu**, Chi Zhang, Henghui Ding, Tzu-Yi Hung, Guosheng Lin, "Few-shot Segmentation with Message Flow and Optimal Transport Matching," *IEEE Transactions on Multimedia*, vol. 25, pp. 5130–5141, 2022. DOI: 10.1109/TMM.2022.3187855. (Top Journal, IF: 7.3)

6. **Weide Liu***, Zhonghua Wu*, Yiming Wang, Henghui Ding, Fayao Liu, Jie Lin, Guosheng Lin, "LCReg: Long-Tailed Image Classification with Latent Categories based Recognition," *Pattern Recognition*, vol. 145, article 109971, February 2024. DOI: 10.1016/j.patcog.2023.109971. (Top Journal, IF: 8.518)

7. **Weide Liu**, Chi Zhang, Guosheng Lin, Tzu-Yi Hung, Chunyan Miao, "Weakly Supervised Segmentation with Maximum Bipartite Graph Matching," in *Proceedings of the 28th ACM International Conference on Multimedia (ACM MM)*, 2020, pp. 2085–2094. DOI:10.1145/3394171.341365 (Acceptance rate: 27%)

8. Tianyi Zhang, Guosheng Lin, **Weide Liu**, Jianfei Cai, Alex Kot, "Splitting vs. Merging: Mining Object Regions with Discrepancy and Intersection Loss for Weakly Supervised Semantic Segmentation," in *Proceedings of the European Conference on Computer Vision (ECCV)*, 2020, pp. 663–679. (Acceptance rate: 27%)

9. **Weide Liu**, Jieming Lou, Xingxing Wang, Wei Zhou, Jun Cheng, Xulei Yang, "Physically-guided Open Vocabulary Segmentation with Weighted Patched Alignment Loss," *Neurocomputing*, vol. 614, article 128788, January 2025. DOI: 10.1016/j.neucom.2024.128788. (Top Journal, IF: 6)

AI for Image Neuro Science

10. **Weide Liu**, Camilo Calixto, Simon K. Warfield, Davood Karimi, "Streamline tractography of the fetal brain in utero with machine learning," *Imaging Neuroscience*, 2025. DOI: 10.1162/*imag_a*_00537. (Top Journal)

11. Qi Zeng, **Weide Liu**, Bo Li, Ryne Didier, P. Ellen Grant, Davood Karimi, "Towards automatic US-MR fetal brain image registration with learning-based methods," *NeuroImage*, 2025. (Top Journal)

AI for Medical Image

* Corresponding Author.

12. Guanghui Yue, Shaoping Zhang, Tianwei Zhou, Bin Jiang, **Weide Liu***, Tianfu Wang, "Pyramid Network with Quality-Aware Contrastive Loss for Retinal Image Quality Assessment," *IEEE Transactions on Medical Imaging (TMI)*, vol. 44, no. 3, pp. 1416–1431, doi: 10.1109/TMI.2024.3501405. (Top Journal, IF: 8.9)

13. Guanghui Yue, Di Cheng, Tianwei Zhou, Jingwen Hou, **Weide Liu**, Long Xu, Tianfu Wang, Jun Chen, "Perceptual Quality Assessment of Enhanced Colonoscopy Images: A Benchmark Dataset and an Objective Method," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 33, no. 10, pp. 5549–5562, October 2023, doi: 10.1109/TCSVT.2023.3260212. (Top Journal, IF: 8.4)

14. Guanghui Yue, Guibin Zhuo, Siying Li, Tianwei Zhou, Jingfeng Du, Weiqing Yan, Jingwen Hou, **Weide Liu**, Tianfu Wang, "Benchmarking Polyp Segmentation Methods in Narrow-Band Imaging Colonoscopy Images," *IEEE Journal of Biomedical and Health Informatics (JBHI)*, vol. 27, no. 7, pp. 3360–3371, July 2023, doi: 10.1109/JBHI.2023.3270724. (Top Journal, IF: 7.021)

15. Guanghui Yue, Guibin Zhuo, Tianwei Zhou, **Weide Liu**, Tianfu Wang, Qiuping Jiang, "Adaptive Cross-Feature Fusion Network With Inconsistency Guidance for Multi-Modal Brain Tumor Segmentation," *IEEE Journal of Biomedical and Health Informatics (JBHI)*, vol. 27, no. 8, pp. 3360–3371, August 2023, doi: 10.1109/JBHI.2023.3347556. (Top Journal, IF: 7.021)

16. Tianrui Liu, Qiyue Wei, Jianguo Chen, **Weide Liu**, Weimin Huang, Ruchir Srivastava, Zhongyao Cheng, Zeng Zeng, Bharadwaj Veeravalli, Xulei Yang, "Unsupervised 3D Lung Segmentation by Leveraging 2D Segment Anything Model," in *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2024.

17. Shenghao Zhao, Xiaoyu Zhang, Ziyuan Zhao, Peisheng Qian, **Weide Liu**, Zeng Zeng, Bharadwaj Veeravalli, Lingyun Dai, Pär Nordlund, Nayana Prabhu, Wai Leong Tam, Xulei Yang, "Hybrid Model Design For Protein Function Prediction," in *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2024.

18. Honghui Chen, Baoquan Zhao, Guanghui Yue, **Weide Liu**, Chenlei Lv, Ruomei Wang, Fan Zhou, "CLIP-MEDFAKE: Synthetic Data Augmentation with AI-Generated Content for Improved Medical Image Classification," in *Proceedings of the IEEE International Conference on Image Processing (ICIP)*, 2024.

19. Guanghui Yue, Peishan Wei, Tianwei Zhou, Chang Tang, **Weide Liu**, Jie Du, "FedPDN: Personalized Federated Learning with Inter-class Similarity Constraint for Medical Image Classification through Parameter Decoupling," *IEEE Transactions on Instrumentation and Measurement (IEEE TIM)*, 2025. (Top Journal, IF: 5.6)

Others

20. **Weide Liu**, Guosheng Lin, Tianyi Zhang, and Zichuan Liu, 'Guided Co-Segmentation Network for Fast Video Object Segmentation', *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, vol. 31, no. 4, pp. 1607–1617, 2020, doi: 10.1109/TCSVT.2020.3010293. (Top Journal, IF: 8.4)

21. **Weide Liu**, Xiaoyang Zhong, Lu Wang, Jingwen Hou, Yuemei Luo, Jiebin Yan, and Yuming Fang, 'Uncertainty Awareness on Unsupervised Domain Adaptation for Time Series Data', *IEEE Transactions on Multimedia*, 2025. (Top Journal, IF: 8.4)

22. **Weide Liu**, Xiaoyang Zhong, Lu Wang, Jingwen Hou, Yuemei Luo, Jiebin Yan, Yuming Fang, 'Uncertainty Awareness for Unsupervised Domain Adaptation on Human Activity Recognition', *International Joint Conference on Artificial Intelligence (IJCAI)*, 2024. (Top Conference)

23. **Weide Liu**, Huijing Zhan, 'Multimodal Sentiment Analysis with Missing Modality: A Knowledge-Transfer Approach', *Asia Pacific Signal and Information Processing Association Annual Summit and Conference* (APSIPA ASC), 2025.

24. **Weide Liu**, Zhonghua Wu, Henghui Ding, Fayao Liu, Jie Lin, Guosheng Lin, Wei Zhou, 'Exploiting independent query information for few-shot image segmentation', *Displays*, 2025

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25. Chao Cai, Yuming Fang, **Weide Liu***, Ruibing Jin, Jun Cheng, and Zhenghua Chen, 'FedCov: Enhanced Trustworthy Federated Learning for Machine RUL Prediction with Continuous-to-Discrete Conversion', *IEEE Transactions on Industrial Informatics*, vol. 20, no. 11, pp. 12565–12574, Nov. 2024, doi: 10.1109/TII.2024.3423314. (Top Journal, IF: 11.7)

26. Chao Cai, **Weide Liu***, Xue Xia, Zhenghua Chen, and Yuming Fang, 'Bayesian Uncertainty Calibration for Federated Time Series Analysis', *IEEE Transactions on Multimedia*, vol. 26, pp. 11151–11163, 2024, doi: 10.1109/TMM.2024.3443627. (Top Journal, IF: 7.3)

27. Rui Gong, **Weide Liu**, Zaiwang Gu, Xulei Yang, Jun Cheng, 'Learning Intra-view and Cross-view Geometric Knowledge for Stereo Matching', in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024, doi:10.1109/CVPR52733.2024.01961.

28. Jieming Lou, **Weide Liu**, Zhuo Chen, Fayao Liu, Jun Cheng, 'ELFNet: Evidential Local-global Fusion for Stereo Matching', in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2023.

29. Rui Gong, Kim-Hui Yap, **Weide Liu**, Xulei Yang, Jun Cheng, 'Rectification-specific Supervision and Constrained Estimator for Online Stereo Rectification', in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.

30. Jianyang Zhang, Qianli Luo, Guowu Yang, Wenjing Yang, **Weide Liu**, Guosheng Lin, Fengmao Lv, 'Attribute-formed Class-specific Concept Space: Endowing Language Bottleneck Model with Better Interpretability and Scalability', in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.

31. Lishao Li, Jingwen Hou, **Weide Liu**, Yuming Fang, Jiebin Yan, 'Diffusion-based Facial Aesthetics Enhancement with 3D Structure Guidance', *IEEE Transactions on Image Processing (TIP)*, doi: 10.1109/TIP.2025.3551077 (Early Access, Top Journal, IF: 10.6).

32. Jingwen Hou, Weisi Lin, Guanghui Yue, **Weide Liu**, Baoquan Zhao, 'Interaction-Matrix Based Personalized Image Aesthetic Assessment', *IEEE Transactions on Multimedia (TMM)*, vol. 24, no. 8, pp. 2345–2356, 2022, doi: 10.1109/TMM.2022.3189276. (Top Journal, IF: 7.3)

33. Jingwen Hou, Henghui Ding, Weisi Lin, **Weide Liu**, Yuming Fang, 'Distilling Knowledge from Object Classification to Aesthetics Assessment', *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, vol. 32, no. 11, pp. 7386–7402, 2022, doi: 10.1109/TCSVT.2022.3186307. (Top Journal, IF: 8.4)

34. Jingwen Hou, Weisi Lin, Yuming Fang, Haoning Wu, Chaofeng Chen, Liang Liao, **Weide Liu**, 'Towards Transparent Deep Image Aesthetics Assessment with Tag-based Content Descriptors', *IEEE Transactions on Image Processing (TIP)*, vol. 32, pp. 1–14, 2023, doi: 10.1109/TIP.2023.3308852. (Top Journal, IF: 10.6)

35. Jiayuan Fan, Haixiang Chen, **Weide Liu**, Xun Xu, Jun Cheng, 'Holistic and Contextual Evidential Stereo-LiDAR Fusion for Depth Estimation', *IEEE Transactions on Intelligent Vehicles (TIV)*, vol. 9, no. 1, pp. 1–12, 2024, doi: 10.1109/TIV.2024.3398210. (Top Journal, IF: 14)

36. Huijing Zhan, Ling Li, Shaohua Li, **Weide Liu**, Manas Gupta, Alex C. Kot, 'Towards Explainable Recommendation via BERT-guided Explanation Generator', in *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023, pp. 1–5, doi: 10.1109/ICASSP49357.2023.10094765. (Top Conference)

37. Yu Wang, Xiaoye Wang, Zaiwang Gu, **Weide Liu**, Wee Siong Ng, Weimin Huang, and Jun Cheng, "SuperJunction: Learning-Based Junction Detection for Retinal Image Registration," in *Proceedings of the AAAI Conference on Artificial Intelligence*, 2024. (Top Conference)

38. Jiebin Yan, Lei Wu, Yuming Fang, Xuelin Liu, Xue Xia, and **Weide Liu**, "Video Quality Assessment for Online Processing: From Spatial to Temporal Sampling," *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, 2025. (Top Journal, IF: 8.4)

39. Zaiwang Gu, **Weide Liu**, Xulei Yang, Chuan-Sheng Foo, and Jun Cheng, "When Low-Vision Task Meets Dense Prediction Tasks with Less Data: An Auxiliary Self-Trained Geometry Regularization," *Transactions on Machine Learning Research (TMLR)*, 2024. (Top Journal)

40. Jiebin Yan, Jiale Rao, Junjie Chen, Ziwen Tan, **Weide Liu**, and Yuming Fang, "Multitask Auxiliary Network for Perceptual Quality Assessment of Non-Uniformly Distorted Omnidirectional Images," *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, 2024. (Top Journal, IF: 8.4)

41. Jingbo Zeng, Zaiwang Gu, **Weide Liu**, Lile Cai, and Jun Cheng, "Uncertainty Aware Interest Point Detection and Description," in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2025. (Top Conference)

42. Jiebin Yan, Jiale Rao, Xuelin Liu, Yuming Fang, Yifan Zuo, and **Weide Liu**, "Subjective and Objective Quality Assessment of Non-Uniformly Distorted Omnidirectional Images," *IEEE Transactions on Multimedia (TMM)*, 2024. (Top Journal, IF: 7.3)

43. Yang Yu, Jiahao Wang, **Weide Liu**, Ivan Ho Mien, Pavitra Krishnaswamy, Xulei Yang, Jun Cheng, 'Multimodal multitask similarity learning for vision language model on radiological images and reports', *Neurocomputing*, Volume 636, 1 July 2025, 130018, doi: 10.1016/j.neucom.2025.130018. (Top Journal, IF: 5.5)

44. Zhantao Cao, Yuanbing Shi, Shuli Zhang, Huanan Chen, **Weide Liu***, Guanghui Yue, Huazhen Lin, 'Decentralized learning for medical image classification with prototypical contrastive network', doi: 10.1002/mp.17753. Medical Physics (Top Journal, IF: 3.177)

PROFESSIONAL SERVICES

Conference Reviewer: CVPR, ECCV, ICCV, ICLR, ICML, NeurIPS, etc.
Journal Reviewer: IJCV, TPAMI, TIP, TCSVT, TMM, TIFS, TNNLS, etc.
Awards:
MICCAI 2022 Travel Grant;
Best Paper Award (First Author) at the 4th International Workshop on Deep Learning for Human Activity Recognition, IJCAI
DAAD AInet Fellowship, 2024
Leadership Roles:
Associate Editor for Signal, Image and Video Processing, From 2024.
Guest Editor for Journal of Visual Communication and Image Representation.
Program Committee of The 2nd International Workshop on Multimedia Computing for Health and Medicine`https://weizhou-geek.github.io/workshop/MM2025.html`;
Track Chair for IECON 2023;
Special Section Chair and Area Chair for ICIP 2024;
Special Issue Chair and Area Chair for ICME 2025;
PHM Society Asia-Pacific Conference, 2025 Track Chair
Organizer of the VQualA 2025 Challenge on Image Super-Resolution Generated Content Quality Assessment: Methods and Results, **ICCV** 2025