Chaowei Fang

Email: chaoweifang@outlook.com

Portfolio: chaoweifang.github.io

Google Scholar: https://scholar.google.com/citations?user=eNtYEmcAAAAJ&hl=en

Address: 266 Xinglong Section of Xifeng Road, Xi'an, Shaanxi 710126, China

Current Position

- Associate Professor, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, School of Artificial Intelligence, Xidian University, Xi'an, China

Research Fields and Interests

- Visual information processing, representation, and understanding.

Education

- **The University of Hong Kong** — Hong Kong
  Ph.D. - Computer Science; Advisor: Prof. Yizhou Yu — *09/2015 - 12/2019*
  Thesis: *Nonlocal feature learning for image segmentation, facial video hallucination, and volumetric segmentation*

- **Xi'an Jiaotong University** — Xi'an, China
  B.Eng. - Automation — *09/2009 - 07/2013*

Sponsored Research Projects

- **国家自然科学面上基金**: 磁共振图像空间分辨率增强的知识表达与模型泛化, 2024-2027.
- **软牛科技**: 视频水印自动识别与去除关键技术研究, 65万元, 2022-2024.
- **华为智能基座课程建设项目**: 深度学习课程建设研究, 2万元, 2022.
- **国家自然科学青年基金**: 面向三维医学图像的语义分割及其域自适应算法研究, 2021-2023.
- **中科川森**: 基于深度学习的表面划痕检测算法, 10万元, 2020.

Publications

∗ *indicates corresponding author, and* † *indicates equal contribution.*

1. **Fang C**, Liao Z, Yu Y. Piecewise flat embedding for image segmentation. IEEE Transactions on Pattern Analysis and Machine Intelligence, 2018, 41(6): 1470-1485.
2. **Fang C**, Li G, Han X, Yu Y. Self-enhanced convolutional network for facial video hallucination. IEEE Transactions on Image Processing, 2019, 29: 3078-3090.
3. **Fang C**, Cheng L, Mao Y, Zhang D, Fang Y, Li G, Qi H, Jiao L. Separating noisy samples from tail classes for long-tailed image classification with label noise. IEEE Transactions on Neural Networks and Learning Systems, 2023.
4. **Fang C**†, Wang Q†, Cheng L, Gao Z, Pan C, Cao Z, Zheng Z, Zhang D. Reliable mutual distillation for medical image segmentation under imperfect annotations. IEEE Transactions on Medical Imaging, 2023. (**Highly Cited Paper**)
5. **Fang C**†, Tian H†, Zhang D, Zhang Q, Han J, Han J. Densely nested top-down flows for salient object detection. Science China Information Sciences, 2022, 65(8). (**Hot Paper**)
6. **Fang C**†, Li X†, Li Z, Jiao L, Zhang D. Interactive Dual-Model Learning for Semi-supervised Medical Image Segmentation. 自动化学报, 2022.
7. **Fang C**, Ma H, Li Z, Cheng D, Zhang Y, Li G. Screening, Rectifying, and Re-Screening: A Unified Framework for Tuning Vision-Language Models with Noisy Labels. Proceedings of the International Joint Conference on Artificial Intelligence, 2025.
8. **Fang C**, Zhou Z, Chen J, Su H, Wu Q, Li G. Variance-Insensitive and Target-Preserving Mask Refinement for Interactive Image Segmentation. Proceedings of the AAAI Conference on Artificial Intelligence, 2024.
9. **Fang C**, Li G, Pan C, Li Y, Yu Y. Globally guided progressive fusion network for 3D pancreas segmentation. Proceedings of the Medical Image Computing and Computer Assisted Intervention, 2019.
10. **Fang C**†, Wang L†, Zhang D, Xu J, Yuan Y, Han J. Incremental cross-view mutual distillation for self-supervised medical CT synthesis. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2022.
11. **Fang C**, Zhang D, Wang L, Zhang Y, Cheng L, Han J. Cross-Modality High-Frequency Transformer for MR Image Super-Resolution. Proceedings of the ACM Conference on Multimedia, 2022.
12. Yu Y, **Fang C**, Liao Z. Piecewise flat embedding for image segmentation. Proceedings of the IEEE International Conference on Computer Vision, 2015. (**student first author**, **oral**)
13. Zhao G†, **Fang C**†, Li G, Jiao L, Yu Y. Contralaterally enhanced networks for thoracic disease detection. IEEE Transactions on Medical Imaging, 2021, 40(9): 2428-2438. (**joint first author**)

14. Huang J†, **Fang C**†, Chen W, Chai Z, Wei X, Wei P, Lin L, Li G. Trash to treasure: Harvesting ood data with cross-modal matching for open-set semi-supervised learning. Proceedings of the IEEE International Conference on Computer Vision, 2021. (**joint first author**)

15. Nie Y†, **Fang C**†, Cheng L, Lin L, Li G. Adapting object size variance and class imbalance for semi-supervised object detection. Proceedings of the AAAI Conference on Artificial Intelligence, 2023. (**joint first author**, **oral**)

16. Li Z†, **Fang C**†, Zhang S. Deep feature representation for the computational analytics of 3D neuronal morphology. Proceedings of the IEEE International Symposium on Biomedical Imaging, 2018. (**joint first author**)

17. Zhu F, **Fang C***, Ma KK. PNEN: Pyramid non-local enhanced networks. IEEE Transactions on Image Processing, 2020, 29: 8831-8841. (**corresponding author**)

18. Chen J, **Fang C***, Li J, Leng Y, Li G*. Decouple and Couple: Exploiting Prior Knowledge for Visible Video Watermark Removal. IEEE Transactions on Image Processing, 2025. (**corresponding author**)

19. Cheng D, Wei L, **Fang C***, He L, Wang N, Gao X. Progressive Feature-Attribute Matching via Bi-directional Generation for Transductive Zero-Shot Learning. IEEE Transactions on Circuits and Systems for Video Technology, 2025. (**corresponding author**)

20. Li G, Chen Z, Mao M, Lin L, **Fang C***. Uncertainty-aware Active Domain Adaptive Salient Object Detection. IEEE Transactions on Image Processing, 2024. (**corresponding author**)

21. Leng Y, **Fang C***, Chen J, Fang Y, Li S, Li G. Bridging Knowledge Gap between Image Inpainting and Large-Area Visible Watermark Removal. Proceedings of the AAAI Conference on Artificial Intelligence, 2025. (**corresponding author**)

22. Leng Y, **Fang C***, Li G, Fang Y, Li G. Removing Interference and Recovering Content Imaginatively for Visible Watermark Removal. Proceedings of the AAAI Conference on Artificial Intelligence, 2024. (**corresponding author**)

23. Cheng L, **Fang C***, Zhang D, Li G, Huang G. Compound batch normalization for long-tailed image classification. Proceedings of the ACM International Conference on Multimedia, 2022. (**corresponding author**)

24. Yang Y†, Cheng D†*, **Fang C**†*, Wang Y, Jiao C, Cheng L, Wang N, Gao X. Diffusion-based Layer-wise Semantic Reconstruction for Unsupervised Out-of-Distribution Detection. Proceedings of the Conference on Neural Information Processing Systems, 2024. (**joint first author**, **corresponding author**)

25. Li Y, Cheng D*, **Fang C***, Jiao C, Wang N, Gao X. Disentangling Identity Features from Interference Factors for Cloth-Changing Person Re-Identification. Proceedings of the ACM International Conference on Multimedia, 2024. (**corresponding author**)

26. Wu F, Cheng L, Tang S, Zhu X, **Fang C**, Zhang D, Wang M. Navigating Semantic Drift in Task-Agnostic Class-Incremental Learning. Proceedings of the International Conference on Machine Learning, 2025.

27. Zhu X, Zhang X, Zhang T, **Fang C**, Tang X, Jiao L. RegionMatch: Pixel-Region Collaboration for Semi-Supervised Semantic Segmentation in Remote Sensing Images. Proceedings of the International Joint Conference on Artificial Intelligence, 2025.

28. Chen S, Liu H, **Fang C**, Shang F, Liu Y, Wan L, Jiang D, Yang Y. Unsupervised Degradation Representation Aware Transform for Real-World Blind Image Super-Resolution. Proceedings of the AAAI Conference on Artificial Intelligence, 2025.

29. Wu Z, Jiang L, Li X, **Fang C**, Qin Y, Li G. Hierarchically Controlled Deformable 3D Gaussians for Talking Head Synthesis. Proceedings of the AAAI Conference on Artificial Intelligence, 2025.

30. Cai C, Tan S, Wang X, Zhang B, **Fang C**, Li G, Xu L, Liu S, Wang R. Real-Time Detection of Hypoxia Stress Behavior in Aquaculture Fish Using an Enhanced YOLOv8 Model. Aquaculture International, 2025.

31. He J, Cheng L, **Fang C**, Feng Z, Mu T, Song M. Progressive Feature Self-Reinforcement for Weakly Supervised Semantic Segmentation. Proceedings of the AAAI Conference on Artificial Intelligence, 2024.

32. Wang Y, Cheng L, **Fang C**, Zhang D, Duan M, Wang M. Revisiting the Power of Prompt for Visual Tuning. Proceedings of the International Conference on Machine Learning, 2024.

33. Cheng D, Tai H, Wang N, **Fang C**, Gao X. Neighbor Consistency and Global-Local Interaction: A Novel Pseudo-label Refinement Approach for Unsupervised Person Re-Identification. IEEE Transactions on Information Forensics & Security, 2024.

34. Zhang Y, Chen Y, **Fang C**, Wang Q, Wu J, Xin J. Learning from Open-set Noisy Labels based on Multi-prototype Modeling. Pattern Recognition, 2024.

35. Yang K, Han J, Guo G, **Fang C**, Fan Y, Cheng L, Zhang D. Progressive Adapting and Pruning: Domain-Incremental Learning for Saliency Prediction. ACM Transactions on Multimedia Computing, Communications, and Applications, 2024.

36. Chen D, Chen J, **Fang C**, Zhang Z. Complex Visual Question Answering based on Uniform Form and Content. Applied Intelligence, 2024.

37. Zhang D, Li H, Zeng W, **Fang C**, Cheng L, Cheng MM, Han J. Weakly Supervised Semantic Segmentation via Alternate Self-Dual Teaching. IEEE Transactions on Image Processing, 2023.

38. Zhang R, Zhang F, Qin S, Fan D, **Fang C**, Ma J, Wan X, Li G, Lin X. Multi-Task Learning With Hierarchical Guidance for Locating and Stratifying Submucosal Tumors. IEEE Journal of Biomedical and Health Informatics, 2023, 27(9): 4478-4488.

39. Wang S, Zang Q, Zhao D, **Fang C**, Quan D, Wan Y, Guo Y, Jiao L. Select, purify, and exchange: A multisource unsupervised domain adaptation method for building extraction. IEEE Transactions on Neural Networks and Learning Systems, 2023.

40. Zhong W, **Fang C**, Cai Y, Wei P, Zhao G, Lin L, Li G. Identity-preserving talking face generation with landmark and appearance priors. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2023.
41. Zhang Z, Chen W, **Fang C**, Li Z, Chen L, Lin L, Li G. RankMatch: Fostering Confidence and Consistency in Learning with Noisy Labels. Proceedings of the IEEE International Conference on Computer Vision, 2023.
42. Wang K, Zhuang J, Li G, **Fang C**, Cheng L, Lin L, Zhou F. De-biased teacher: Rethinking iou matching for semi-supervised object detection. Proceedings of the AAAI Conference on Artificial Intelligence, 2023.
43. Zhang K, Li Z, Cai C, Liu J, Xu D, **Fang C**, Huang P, Wang Y, Yang M, Chang S. Semi-supervised graph convolutional networks for the domain adaptive recognition of thyroid nodules in cross-device ultrasound images. Medical Physics, 2023, 50(12): 7806-7821.
44. Qu T, Wang X, **Fang C**, Mao L, Li J, Li P, Qu J, Li X, Xue H, Yu Y, Jin Z. M3Net: A multi-scale multi-view framework for multi-phase pancreas segmentation based on cross-phase non-local attention. Medical image analysis, 2022, 75.
45. Wang K, Nie Y, **Fang C**, Han C, Wu X, Wang X, Lin L, Zhou F, Li G. Double-Check Soft Teacher for Semi-Supervised Object Detection. Proceedings of the International Joint Conference on Artificial Intelligence, 2022.
46. Li J, **Fang C**, Li G. Gradient-Rebalanced Uncertainty Minimization for Cross-Site Adaptation of Medical Image Segmentation. Proceedings of the Chinese Conference on Pattern Recognition and Computer Vision, 2022.
47. Zhao X, **Fang C**, Fan DJ, Lin X, Gao F, Li G. Cross-level contrastive learning and consistency constraint for semi-supervised medical image segmentation. Proceedings of the IEEE International Symposium on Biomedical Imaging, 2022.
48. Huang Y, Liang X, **Fang C**. CALLip: Lipreading using contrastive and attribute learning. Proceedings of the ACM International Conference on Multimedia, 2021.
49. Qi B, Zhao G, Wei X, **Fang C**, Chen Z, Li J. Weakly Supervised Disease Localization in Chest X-rays via Looking into Image Relations. Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine, 2021.
50. Zhao X, **Fang C**, Gao F, Fan DJ, Lin X, Li G. Deep transformers for fast small intestine grounding in capsule endoscope video. Proceedings of the IEEE International Symposium on Biomedical Imaging, 2021.
51. Cai C, Xu D, **Fang C**, Yang M, Li Z. Graph neural networks for the cross-domain histopathological image classification. Proceedings of the IEEE International Symposium on Biomedical Imaging, 2021.
52. Li Z, Fan X, Shang Z, Zhang L, Zhen H, **Fang C**. Towards computational analytics of 3D neuron images using deep adversarial learning. Neurocomputing, 2021, 438: 323-333.
53. Wang J, Zhou S, **Fang C**, Wang L, Wang J. Meta corrupted pixels mining for medical image segmentation. Proceedings of the Medical Image Computing and Computer Assisted Intervention, 2020.
54. Zhang W, **Fang C**, Li G. Automatic colorization with improved spatial coherence and boundary localization. Journal of Computer Science and Technology, 2017, 32: 494-506.

Chinese Patents

1. 方超伟, 付柏霖, 程德. 图像超分辨率重建系统的训练方法、图像重建方法及系统. No. ZL202411186704.2. 2024/11/26.
2. 程乐超, 田海滨, 方超伟, 张鼎文. 一种轻量级的显著性物体检测系统及方法. No. 202210565928.9. 2022/12/02.
3. 程乐超, 方超伟, 李根. 基于混合批归一化的长尾学习图像分类、训练方法及装置. No. 202210794485.0. 2022/07/07.
4. 程乐超, 李雪, 方超伟, 张鼎文. 一种基于双模型交互学习的半监督医学图像分割方法及装置. No. 202210228536.3. 2022/05/17.
5. 程乐超, 王良, 方超伟, 张鼎文. 一种跨模态核磁共振超分网络及图像超分辨率方法. No. 202210250052.9. 2022/05/16.

Research Experiences

- **Xidian University** Xi'an, China
  Associate Professor at School of Artificial Intelligence *09/2020 - Current*
  1. Develop real-world image super-resolution techniques.
  2. Develop visible watermark removal techniques.
  3. Develop methods on noisy label learning, person reid, zero-shot learning, deepfake detection, talking face generation, etc.
- **Xidian University** Xi'an, China
  Lecturer at School of Artificial Intelligence *03/2020 - 09/2023*
  1. Develop natural/medical image synthesis and restoration models.
  2. Develop network optimization algorithms under low-quality training data (few, noisy, or long-tailed training data).
  3. Develop learning algorithms for transferring models across domains.
  4. Design network architectures for combining multi-modal information.
  5. Develop visible watermark removal techniques.
- **The University of Hong Kong** Hong Kong
  Ph.D. candidate at Department of Computer Science *09/2015 - 12/2019*
  1. Develop pixel-wise non-linear embedding algorithm for unsupervised image segmentation.
  2. Develop video super-resolution models based on frame-recurrent propagation strategy and LSTM modules.

3. Develop 3D medical image segmentation network for pancreas segmentation.
4. Develop low-level image processing algorithms such as edge-aware smoothing and image colorization.

- **Deepwise** Beijing, China
  Intern at Deepwise AI Lab *02/2019 - 05/2019*
  1. Finish the research project on 3D medical image segmentation.
  2. Conduct engineering development on removing occlusions on medical images caused by manual marks.

- **Zhejiang University** Hangzhou, China
  Research Assistant College of Computer Science and Technologies *09/2013 - 09/2015, 06/2017 - 12/2017*
  1. Develop pixel-wise non-linear embedding algorithm for unsupervised image segmentation.
  2. Develop audio-driven talking face generation methods.

Teaching Record

Semester	***Course Name***	***Course ID***	***Class Hour***
2020-2025 Spring	Deep Learning (professional course)	AI205010-04	32
2021-2025 Spring	Deep Learning (general course)	AI006007-01	8
2021-2025 Spring	Specialty Experiment Based on Intelligent System	AI202009-02	32

Professional Activities

- Guest editor for journals
  1. Multimedia Tools and Applications, 2022-2023
- Organizer for conferences/symposiums
  1. Program Co-chair of The 3rd International Workshop On Human-Centric Multimedia Analysis at ACM MM 2022
- Reviewer for journals
  1. IEEE Transactions on Human-Machine Systems
  2. IEEE Transactions on Image Processing
  3. IEEE Transactions on Neural Networks and Learning Systems
  4. IEEE Transactions on Cybernetics
  5. IEEE Transactions on Cogitive and Development Systems
  6. IEEE Transactions on Circuits and Systems for Video Technology
  7. IEEE Transactions on Multimedia
  8. Medical Image Analysis
  9. IEEE Journal of Biomedical and Health Informatics
  10. The Visual Computer
- Reviewer for conferences
  1. ECAI 2024-2025 (SPC)
  2. IJCAI 2025
  3. CVPR 2021-2025
  4. ICCV 2023
  5. ECCV 2022-2024
  6. AAAI 2021-2024
  7. ACMMM 2023-2025
  8. MICCAI 2020, 2022
  9. NeurIPS 2021, 2025
- Memberships
  1. 中国人工智能学会会员(CAAI Member), 2022-2023
  2. 中国图像图形学会会员(CSIG Member), 2021-2022

Hobbies

- Reading professional/literary books; running; swimming.