

# Wenqi Ren      Professor

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## CONTACT INFORMATION

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## EDUCATION

<b>Tianjin University</b> , Tianjin, China	Sep. 2013 - Jun. 2017
Ph.D. student, Computer Science	
• Advisor: Xiaochun Cao	
<b>University of California, Merced</b> , CA, USA	Sep. 2015 - Sep. 2016.
Joint-training Ph.D. student, EECS	
• Advisor: Ming-Hsuan Yang	
<b>Tianjin University of Technology</b> , Tianjin, China	Sep. 2010 - Mar. 2013.
Masters of Science, Computer Science	
• Advisor: Yuanquan Wang	
<b>Hebei University of Technology</b> , Tianjin, China	Sep. 2006 - Jun. 2010.
Bachelor of Science, Electronic and Information Engineering	

## RESEARCH INTERESTS

- **Computer Vision, Machine Learning**  
image deblurring, image dehazing, image denoising, image super-resolution, video deblurring, motion estimation, deep learning

## PUBLICATIONS: JOURNAL PAPERS

- 1) Wenqi Ren, Jiawei Zhang, Jinshan Pan, Sifei Liu, Jimmy S. Ren, Junping Du, Xiaochun Cao, and Ming-Hsuan Yang, Single Image Deblurring Dynamic Scenes via Spatially Varying Recurrent Neural Networks, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2022.
- 2) Wenqi Ren, Senyou Deng, Kaihao Zhang, Fenglong Song, and Xiaochun Cao, Fast Ultra High-Definition Video Deblurring via Multi-Scale Separable Network, *International Journal of Computer Vision (IJCV)* 2023.
- 3) Wenqi Ren, Jinshan Pan, Hua Zhang, Xiaochun Cao, and Ming-Hsuan Yang, Single Image Dehazing via Multi-Scale Convolutional Neural Networks with Holistic Edges, *International Journal of Computer Vision (IJCV)*, 2020.
- 4) Wenqi Ren, Linrui Wu, Yanyang Yan, Shengyao Xu, Feng Huang, and Xiaochun Cao, INformer: Inertial-based Fusion Transformer for Camera Shake Deblurring, in *IEEE Transactions on Image Processing (IEEE TIP)*, vol. 33, pp. 6045-6056, 2024.
- 5) Wenqi Ren, Jingang Zhang, Xiangyu Xu, Lin Ma, Xiaochun Cao, and Wei Liu, Deep Network for Video Dehazing, *IEEE Transactions on Image Processing (IEEE TIP)*, 2019.

- 6) Wenqi Ren, Sifei Liu, Lin Ma, Qianqian Xu, Xiangyu Xu, Xiaochun Cao, Junping Du, and Ming-Hsuan Yang, Low-Light Image Enhancement via a Deep Hybrid Network, IEEE Transactions on Image Processing (**IEEE TIP**), 2019.
- 7) Wenqi Ren, Xiaochun Cao, Jinshan Pan, Xiaojie Guo, Wangmeng Zuo and Ming-Hsuan Yang, Image Deblurring via Enhanced Low Rank Prior, IEEE Transactions on Image Processing (**IEEE TIP**), 7(25), 3426-3437, 2016.
- 8) Jinshan Pan<sup>#</sup>, Wenqi Ren<sup>#</sup> (<sup>#</sup> indicates equal contribution), Zhe Hu, and Ming-Hsuan Yang, *Learning to Deblur Images with Exemplars*, IEEE Pattern Analysis and Machine Intelligence (**IEEE TPAMI**), 2019
- 9) Yuning Cui, Wenqi Ren\*(corresponding author), Alois Knoll, Exploring the Potential of Pooling Techniques for Universal Image Restoration, IEEE Transactions on Image Processing (**IEEE TIP**), 2025.
- 10) Yuning Cui, Mingyu Liu, Wenqi Ren\*(corresponding author), Alois Knoll, Modumer: Modulating Transformer for Image Restoration, IEEE Transactions on Neural Networks and Learning Systems (**IEEE TNNLS**) 2025.
- 11) Yuning Cui, Wenqi Ren\*(corresponding author), Xiaochun Cao, and Alois Knoll. Revitalizing Convolutional Network for Image Restoration. IEEE Transactions on Pattern Analysis and Machine Intelligence (**IEEE TPAMI**), 2024.
- 12) Yuning Cui, Wenqi Ren\*(corresponding author), Xiaochun Cao, Alois Knoll; Image Restoration via Frequency Selection, IEEE Transactions on Pattern Analysis and Machine Intelligence (**IEEE TPAMI**), 2024
- 13) Jun Luo, Yunfeng Nie, Wenqi Ren\*(corresponding author), Xiaochun Cao, Ming-Hsuan Yang, Correcting Optical Aberration via Depth-Aware Point Spread Functions, IEEE Transactions on Pattern Analysis and Machine Intelligence (**IEEE TPAMI**), 2024
- 14) Jun Luo, Wenqi Ren\*(corresponding author), Xinwei Gao, Xiaochun Cao, Multi-Exposure Image Fusion via Deformable Self-Attention, IEEE Transactions on Image Processing (**IEEE TIP**) 2023.
- 15) Weilei Wen, Wenqi Ren\*(corresponding author), Yinghuan Shi, Yunfeng Nie, Jingga Zhang, Xiaochun Cao, Video Super-Resolution via a Spatio-Temporal Alignment Network, IEEE Transactions on Image Processing (**IEEE TIP**) 2022, 31: 1761-1773.
- 16) Xiaobin Hu, Wenqi Ren\*(corresponding author), Jiaolong Yang, Xiaochun Cao, David P Wipf, Bjoern Menze, Xin Tong, Hongbin Zha, Face Restoration via Plug-and-Play 3D Facial Priors, IEEE Transactions on Pattern Analysis and Machine Intelligence (**IEEE TPAMI**), 2022.

- 17) Jun Luo, Wenqi Ren\*(corresponding author), Tao Wang, Chongyi Li, Xiaochun Cao, Under-Display Camera Image Enhancement via Cascaded Curve Estimation, IEEE Transactions on Image Processing (**IEEE TIP**) 2022, 31, 4856-4868
- 18) Siyuan Li, Wenqi Ren\*(corresponding author), Feng Wang, I. B. Araujo, E. K Tokuda, R. H. Junior, R. M Cesar-Jr, Zhangyang Wang, Xiaochun Cao, *A comprehensive benchmark analysis of single image deraining: Current challenges and future perspectives*, International Journal of Computer Vision (**IJCV**), 2021.
- 19) Yanyang Yan, Wenqi Ren, Xiaobin Hu, Kun Li, Haifeng Shen, Xiaochun Cao, *SR-GAT: Single Image Super-Resolution With Graph Attention Network*, IEEE Transactions on Image Processing (**IEEE TIP**), 2021.
- 20) Jingang Zhang, Wenqi Ren, Shengdong Zhang, He Zhang, Yunfeng Nie, Zhe Xue, Xiaochun Cao, *Hierarchical Density-Aware Dehazing Network*, IEEE Transactions on Cybernetics, 2021.
- 21) Chongyi Li, Saeed Anwar, Junhui Hou, Runmin Cong, Chunle Guo, Wenqi Ren, *Underwater Image Enhancement via Medium Transmission-Guided Multi-Color Space Embedding*, IEEE Transactions on Image Processing (**IEEE TIP**), 2021.
- 22) Mingye Ju, Can Ding, Wenqi Ren, Yi Yang, Dengyin Zhang, Y Jay Guo, *IDE: Image dehazing and exposure using an enhanced atmospheric scattering model*, IEEE Transactions on Image Processing (**IEEE TIP**), 2021.
- 23) Chongyi Li, Chunle Guo, Wenqi Ren\*, Runmin Cong, Junhui Hou, Sam Kwong, Dacheng Tao. An Underwater Image Enhancement Benchmark Dataset and Beyond. IEEE Trans. Image Processing (**IEEE TIP**), 2020
- 24) Qingbo Wu, Wenqi Ren, Xiaochun Cao. Learning Interleaved Cascade of Shrinkage Fields for Joint Image Dehazing and Denoising. IEEE Trans. Image Processing (**IEEE TIP**), 29: 1788-1801, 2020.
- 25) Qingbo Wu, Jingang Zhang, Wenqi Ren, Wangmeng Zuo, Xiaochun Cao. Accurate Transmission Estimation for Removing Haze and Noise From a Single Image. IEEE Trans. Image Processing (**IEEE TIP**) 29: 2583-2597, 2020.
- 26) Lerenhan Li, Yunlong Dong, Wenqi Ren, Jinshan Pan, Changxin Gao, Nong Sang, Ming-Hsuan Yang. Semi-Supervised Image Dehazing. IEEE Trans. Image Processing (**IEEE TIP**) 29: 2766-2779, 2020.
- 27) Yanyang Yan, Wenqi Ren, Xiaochun Cao. Recolored Image Detection via a Deep Discriminative Model. IEEE Trans. Information Forensics and Security (**IEEE TIFS**) 14(1): 5-17, 2019.

PUBLICATIONS:  
CONFERENCE  
PAPERS

- 1) Wenqi Ren, Jiaolong Yang, Senyou Deng, David Wipf, Xiaochun Cao, and Xin Tong, Face Video Deblurring using 3D Facial Priors, in IEEE International Conference on Computer Vision, (**IEEE ICCV**), 2019. (**Oral**)
- 2) Wenqi Ren, Lin Ma, Jiawei Zhang, Jinshan Pan, Xiaochun Cao, Wei Liu, and Ming-Hsuan Yang, Gated Fusion Network for Single Image Dehazing, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2018.
- 3) Wenqi Ren, Jiawei Zhang, Lin Ma, Jinshan Pan, Xiaochun Cao, Wei Liu, and Ming-Hsuan Yang Deep Non-Blind Deconvolution via Generalized Low-Rank Approximation, Neural Information Processing Systems Conference (**NeurIPS**), 2018
- 4) Wenqi Ren, Jinshan Pan, Xiaochun Cao, and Ming-Hsuan Yang, *Video Deblurring via Semantic Segmentation and Pixel-Wise Non-Linear Kernel*, in IEEE International Conference on Computer Vision (**IEEE ICCV**), 2017
- 5) Wenqi Ren, Si Liu, Hua Zhang, Jinshan Pan, Xiaochun Cao, and Ming-Hsuan Yang, *Single Image Dehazing via Multi-Scale Convolutional Neural Networks*, in European Conference on Computer Vision (**ECCV**), 2016.
- 6) Shangquan Sun, Wenqi Ren\*(corresponding author), Zikun Liu, Hyunhee Park, Rui Wang, Xiaochun Cao, EnsIR: An Ensemble Algorithm for Image Restoration via Gaussian Mixture Models, in Advances in Neural Information Processing Systems (**NeurIPS**) 2024, 133487-133517.
- 7) Dehong Kong, Fan Li, Zhixin Wang, Jiaqi Xu, Renjing Pei, Wenbo Li, Wenqi Ren\* (corresponding author), Dual prompting image restoration with diffusion transformers, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2025, 12809-12819.
- 8) Xiaobin Lu, Xiaobin Hu, Jun Luo, Ben Zhu, Paul Ruan, Wenqi Ren\* (corresponding author), 3D Priors-Guided Diffusion for Blind Face Restoration, in ACM International Conference on Multimedia (**ACM MM**) 2024, 1829-1838.
- 9) Shangquan Sun, Wenqi Ren\* (corresponding author), Xinwei Gao, Rui Wang, Xiaochun Cao, Restoring Images in Adverse Weather Conditions via Histogram Transformer, in European Conference on Computer Vision (**ECCV**), 2024.
- 10) Yuning Cui, Wenqi Ren\* (corresponding author), Sining Yang, Xiaochun Cao, Alois Knoll, IRNeXt: Rethinking Convolutional Network Design for Image Restoration, International Conference on Machine Learning (**ICML**) 2023.
- 11) Aiping Zhang, Wenqi Ren\* (corresponding author), Yi Liu, Xiaochun Cao, Lightweight Image Super-Resolution with Superpixel Token Interaction, in IEEE International Conference on Computer Vision, (**IEEE ICCV**), 2023.
- 12) Yuning Cui, Wenqi Ren\* (corresponding author), Xiaochun Cao, Alois Knoll, Focal Network for Image Restoration, in IEEE International Conference on Computer

Vision, (**IEEE ICCV**), 2023.

- 13) Yuning Cui, Yi Tao, Zhenshan Bing, Wenqi Ren\* (corresponding author), Xinwei Gao, Xiaochun Cao, Kai Huang, Alois Knoll, Selective Frequency Network for Image Restoration, International Conference on Learning Representations (ICLR) 2023.
- 14) Shangquan Sun, Wenqi Ren\* (corresponding author), Tao Wang, Xiaochun Cao, Rethinking Image Restoration for Object Detection, Neural Information Processing Systems Conference (NeurIPS), 2022
- 15) Kai Li, Wenqi Ren\* (corresponding author), Jianshu Li, Wei Wang, Xiaochun Cao. Critical Forgetting-Based Multi-Scale Disentanglement for Deepfake Detection. in Association for the Advancement of Artificial Intelligence (**AAAI**) 2025.
- 16) Shangquan Sun, Wenqi Ren\* (corresponding author), Jingzhi Li, Rui Wang, Xiaochun Cao. Logit Standardization in Knowledge Distillation, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2024.
- 17) Senyou Deng, Wenqi Ren\* (corresponding author), Yanyang Yan, Tao Wang, Fenglong Song, and Xiaochun Cao, "Multi-Scale Separable Network for Ultra-High-Definition Video Deblurring", in IEEE International Conference on Computer Vision, (**IEEE ICCV**), 2021
- 18) Zhuoran Zheng, Wenqi Ren\* (corresponding author), Xiaochun Cao, Xiaobin Hu, Tao Wang, Fenglong Song, Xiuyi Jia, *Ultra-High-Definition Image Dehazing via Multi-Guided Bilateral Learning*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2021.
- 19) Dongxu Li, Chenchen Xu, Kaihao Zhang, Xin Yu, Yiran Zhong, Wenqi Ren, Hanna Suominen, Hongdong Li *Arvo: Learning all-range volumetric correspondence for video deblurring*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2021.
- 20) Xiong Zhang, Hongmin Xu, Hong Mo, Jianchao Tan, Cheng Yang, Lei Wang, Wenqi Ren, *Dcnas: Densely connected neural architecture search for semantic image segmentation*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2021.
- 21) Kaihao Zhang, Wenhan Luo, Björn Stenger, Wenqi Ren, Lin Ma, Hongdong Li, *Every Moment Matters: Detail-Aware Networks to Bring a Blurry Image Alive*, in ACM International Conference on Multimedia (**ACMMM**), 2020. (**Oral**)
- 22) Xiaobin Hu, Wenqi Ren\*(corresponding author), John LaMaster, Xiaochun Cao, Xiaoming Li, Zechao Li, Bjoern Menze, Wei Liu, *Face super-resolution guided by 3d facial priors*, in European Conference on Computer Vision (**ECCV**), 2020. (**Spotlight**)

- 23) Kaihao Zhang, Wenhan Luo, Wenqi Ren, Jingwen Wang, Fang Zhao, Lin Ma, Hong-dong Li, *Beyond Monocular Deraining: Stereo Image Deraining via Semantic Understanding*, in European Conference on Computer Vision (**ECCV**), 2020.
- 24) Ben Niu, Weilei Wen, Wenqi Ren, Xiangde Zhang, Lianping Yang, Shuzhen Wang, Kaihao Zhang, Xiaochun Cao, Haifeng Shen, *Single image super-resolution via a holistic attention network*, in European Conference on Computer Vision (**ECCV**), 2020.
- 25) Siyuan Yao, Hua Zhang, Wenqi Ren, Chao Ma, Xiaoguang Han, Xiaochun Cao, *Robust online tracking via contrastive spatio-temporal aware network*, IEEE Transactions on Image Processing (**IEEE TIP**), 2021.
- 26) Jie Gui, Xiaofeng Cong, Yuan Cao, Wenqi Ren, Jun Zhang, Jing Zhang, Dacheng Tao, *A Comprehensive Survey on Image Dehazing Based on Deep Learning*, in International Joint Conference on Artificial Intelligence (**IJCAI**) 2021.
- 27) Hong Mo, Wenqi Ren, Yuan Xiong, Xiaoqi Pan, Zhong Zhou, Xiaochun Cao, Wei Wu *Background Noise Filtering and Distribution Dividing for Crowd Counting*, IEEE Transactions on Image Processing (**IEEE TIP**), 2020.
- 28) Qingbo Wu, Wenqi Ren, Xiaochun Cao, *Learning interleaved cascade of shrinkage fields for joint image dehazing and denoising*, IEEE Transactions on Image Processing (**IEEE TIP**), 2020.
- 29) Qingbo Wu, Jingang Zhang, Wenqi Ren, Wangmeng Zuo, Xiaochun Cao, *Accurate transmission estimation for removing haze and noise from a single image*, IEEE Transactions on Image Processing (**IEEE TIP**), 2020.
- 30) Wenhan Yang, Ye Yuan, Wenqi Ren, Jiaying Liu, Walter J Scheirer, Zhangyang Wang, et al., *Advancing image understanding in poor visibility environments: A collective benchmark study*, IEEE Transactions on Image Processing (**IEEE TIP**), 2020.
- 31) Yuanjie Shao, Lerenhan Li, Wenqi Ren, Changxin Gao, Nong Sang, *Domain adaptation for image dehazing*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2020.
- 32) Xiaochun Cao, Wenqi Ren\*, Wangmeng Zuo, Xiaojie Guo, and Hassan Foroosh, *Scene Text Deblurring Using Text-specific Multi-scale Dictionaries*, IEEE Transactions on Image Processing (**IEEE TIP**), 4(24), 1302-1314, 2015.
- 33) Boyi Li, Wenqi Ren, Dengpan Fu, Dacheng Tao, Dan Feng, Wenjun Zeng, and Zhangyang Wang, *Benchmarking Single Image Dehazing and Beyond*, IEEE Transactions on Image Processing (**IEEE TIP**), 2019
- 34) Siyuan Li, I. B. Araujo, Wenqi Ren\*, Zhangyang Wang, E. K. Tokuda, R. Hirata, R. Cesar, Jiawan Zhang, Xiaojie Guo, and Xiaochun Cao, *Single Image Deraining: A*

Comprehensive Benchmark Analysis, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2019.

- 35) Zhe Xue, Junping Du, Dawei Du, Wenqi Ren, Siwei Lyu. Deep Correlated Predictive Subspace Learning for Incomplete Multi-View Semi-Supervised Classification. (**IJCAI**) 2019.
- 36) Xiangyu Xu, Deqing Sun, Sifei Liu, Wenqi Ren, Yujin Zhang, Ming-Hsuan Yang, and Jian Sun, *Rendering Portraiture from Monocular Camera and Beyond*, in European Conference on Computer Vision, (**ECCV**), 2018.
- 37) Yanyang Yan, Wenqi Ren, Yuanfang Guo, Rui Wang, and Xiaochun Cao, *Image Deblurring via Extreme Channels Prior*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2017.
- 38) Hua Zhang, Si Liu, Changqing Zhang, Wenqi Ren, Rui Wang, and Xiaochun Cao, *SketchNet: Sketch Classification with Web Images*, in IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR**), 2016.

PROFESSIONAL ACTIVITIES

*Reviewer*

- CVPR/ICCV/ECCV/NIPS/AAAI/IJCAI/BMVC/ACCV
- TPAMI, IJCV, TNNLS, TIP, TMM, TCSVT, CVIU

*Talk*

- ECCV 2016 Tutorial: Discriminative Learning of Deep CNN Models for Image Restoration
- PCM 2017: Deep Video Dehazing, Best Paper Finalist.

AWARDS

- First Prize of Natural Science Award**, Chinese Institute of Electronics (CIE), 2024.  
**First Prize of Natural Science Award**, China Society of Image and Graphics (CSIG), 2024.  
**Excellent PhD Thesis**, China Computer Federation (CCF), 2019.  
**Star Track Program**, MSRA, 2018.  
**Excellent PhD Thesis Candidate**, CAAI, 2018.  
**Tencent Rhino-Bird Elite Graduate**, Tencent, 2017.  
**Best Poster**, VALSE, 2017.  
**Doctoral Consortium Award**, CVPR, 2017.  
**National Scholarship**, Tianjin University, 2016.  
**Academic Quality Prize**, Tianjin University, 2016.  
**China Scholarship Council Fellowship**, Tianjin University, 2015.  
**Best Paper**, Tianjin Conference on Computer Science for Postgraduate Students, 2015.

REFERENCES

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