Yulun Zhang

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CONTACT INFORMATION

Computer Vision Lab,
ETH Zürich, Switzerland
Homepage: https://yulunzhang.com

yulun100@gmail.com
Tel: +41-779842713
Google Scholar, Github

RESEARCH INTERESTS

Machine Learning: deep learning.
Computer Vision: image/video restoration (e.g., super-resolution, denoising, deblurring), synthesis (e.g., style transfer, texture transfer), biomedical image enhancement and analysis, deep model compression, computational imaging (e.g., spectral compressive imaging).

EDUCATION

Northeastern University, Boston, USA — Sep 2017 – Aug 2021

Ph.D., Department of ECE, College of Engineering — Advisor: *Prof.* Yun Fu

- Major in Computer Engineering
- Committee: *Prof.* Octavia Camps, *Prof.* Hanspeter Pfister

Tsinghua University, Beijing, China — Sep 2014 – Jul 2017

M.E., Department of Automation — Advisor: *Prof.* Yongbing Zhang

- Major in Control Engineering

Xidian University, Xi'an, China — Sep 2009 – Jul 2013

B.S., School of Electronic Engineering

- Major in Intelligence Science and Technology

RESEARCH AND WORK EXPERIENCE

AI Institute, Shanghai Jiao Tong University — Mar 2024 –
Tenure-Track Associate Professor

Computer Vision Lab, ETH Zürich, Switzerland — Oct 2021 – Feb 2024
Postdoctoral Researcher — Advisor: *Prof.* Luc Van Gool
Projects: Efficient image and video enhancement.

SMILE lab, Northeastern University, Boston, USA — Sep 2017 – Aug 2021
Research Assistant — Advisor: *Prof.* Yun Fu
Projects: Deep learning for image restoration and generation.

VCG, SEAS, Harvard University, Cambridge, USA — May 2020 – Aug 2020
Fellow — Advisor: *Prof.* Hanspeter Pfister
Projects: Biomedical image restoration and analysis.

Adobe Research, San Jose, USA — Jun 2019 – Aug 2019
Research Intern Mentors: Zhifei Zhang, Stephen DiVerdi, Zhaowen Wang, Jose Echevarria
Projects: Painting super-resolution.

Adobe Research, San Jose, USA — May 2018 – Aug 2018
Research Intern Mentors: Chen Fang, Zhaowen Wang, Yilin Wang, Jimei Yang, Zhe Lin
Projects: Image style transfer.

Tsinghua University, China — Mar 2014 – Jul 2017
Research Assistant — Advisor: *Prof.* Yongbing Zhang
Projects: Image super-resolution and compression artifact removal via sparse/collaborative representation and deep learning.

SIAT, Chinese Academy of Sciences, China — Oct 2016 – Jun 2017
Research Assistant — Advisor: *Prof.* Yu Qiao
Projects: Generative adversarial networks (GAN) for image restoration/generation.

The University of Sydney, Australia — Jan 2016 – Jun 2016
Visiting Student — Advisor: *Prof.* Dong Xu and Prof. Wen Li
Projects: Research on metric learning with privileged information for visual recognition.

Nanyang Technological University, Singapore Nov 2015 – Jan 2016
Project Officer Advisor: *Prof.* Dong Xu and *Prof.* Li Niu
Projects: Exploiting privileged information from web data for visual recognition.

Xidian University, China Jun – Aug 2012, Dec 2012 – Feb 2014
Position: Research Assistant Advisor: *Prof.* Shuyuan Yang
Projects: 1. Learning efficient features for action recognition in video domain. 2. Depth extraction from natural images using optical flow.

Teaching

Instructor

- EECE5642 Data Visualization, Northeastern University, USA Spring 2020
  Work as an independent instructor throughout the whole semester

Teaching Assistant

- DS5500 Information Visualization: Applications in Data Science, Northeastern University, USA Spring and Summer 2021
  Instructor: *Prof.* David Brady
- EECE5639 Computer Vision, Northeastern University, USA Fall 2018
  Instructor: *Prof.* Octavia Camps
- Modern Signal Processing, Tsinghua University, China Fall 2015
  Instructor: *Prof.* Yongbing Zhang

Honors and Awards

- **Highlighted Reviewer**, ICLR, 2022
- **First Place Award**, Spectral Reconstruction from RGB challenge, IEEE CVPR, 2022
- Global Top 100 Chinese Rising Stars in Artificial Intelligence, Baidu, 2021
- Ranked top 20 in Baidu Scholarship, Baidu 2020
- **Best Paper Award**, RLQ workshop, IEEE ICCV, 2019
- PhD Network Travel Grant, Northeastern University, USA, 2018, 2019
- Dean's Fellowship in Northeastern University, USA, 2017
- Shenzhen Universiade International Scholarship, China, 2017
- Excellent Graduate of Beijing, China, 2017
- Excellent Graduate of Department of Automation, Tsinghua University, 2017
- Excellent Master Thesis of Tsinghua University, 2017
- **Second Place Award**, Single image SR challenge, IEEE CVPR, 2017
- National Scholarship (Ministry of Education, China, Top 2%), 2016
- **Best Student Paper Award**, IEEE VCIP, 2015
- Jingzhi Research Award in Tsinghua University (Top 5%), 2015
- Second Prize Scholarship of Xidian University, 2011, 2012
- Third Prize Scholarship of Xidian University, 2010

Publications

Citations: ***15908****, h-index:* ***40****, i10-index:* ***76*** *(Google Scholar, Feb 1, 2024)*
†: equal contribution; ∗: corresponding author; ‡: equal advising

Journal Papers

6 TPAMI, 1 IJCV, 7 TIP, 3 TNNLS, 2 TMM, 1 TSMC, 1 TCSVT, 1 TCYB

[J22] Jiahua Dong, Hongliu Li, Yang Cong, Gan Sun, **Yulun Zhang**, and Luc Van Gool, "No One Left Behind: Real-World Federated Class-Incremental Learning", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2023. (IF: 24.314)

[J21] Chunming He, Kai Li, Guoxia Xu, Jiangpeng Yan, Longxiang Tang, **Yulun Zhang**, Xiu Li, and Yaowei Wang, "HQG-Net: Unpaired Medical Image Enhancement with High-Quality Guidance", *IEEE Transactions on Neural Networks and Learning Systems* (**TNNLS**), 2023. (IF: 14.255)

[J20] Yiqun Mei, Yuchen Fan, **Yulun Zhang**, Jiahui Yu, Yuqian Zhou, Ding Liu, Yun Fu, Thomas S. Huang, and Humphrey Shi, "Pyramid Attention Network for Image Restoration", *International Journal of Computer Vision* (**IJCV**), 2023. (IF: 13.369)

[J19] Bin Xia, Yapeng Tian, **Yulun Zhang**, Yucheng Hang, Wenming Yang, and Qingmin Liao, "Meta-Learning basedDegradation Representation for Blind Super-Resolution", *IEEE Transactions on Image Processing* (**TIP**), 2023. (IF: 11.041)

[J18] Chang Liu, Henghui Ding, **Yulun Zhang**, and Xudong Jiang, "Multi-Modal Mutual Attention and Iterative Interaction for Referring Image Segmentation", *IEEE Transactions on Image Processing* (**TIP**), 2023. (IF: 11.041)

[J17] Huan Wang†, **Yulun Zhang**†,*, Can Qin, Luc Van Gool, and Yun Fu, "Global Aligned Structured Sparsity Learning for Efficient Image Super-Resolution", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2023. (IF: 24.314)

[J16] Qiang Wang, Gan Sun, Jiahua Dong, and **Yulun Zhang**, "PFDN: Pyramid Feature Decoupling Network for Single Image Deraining", *IEEE Transactions on Image Processing* (**TIP**), 2022. (IF: 11.041)

[J15] Xiaotong Luo, Yanyun Qu, Yuan Xie, **Yulun Zhang**, Cuihua Li, and Yun Fu, "Lattice Network for Lightweight Image Restoration", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2022. (IF: 24.314)

[J14] Weihao Xia, **Yulun Zhang**, Yujiu Yang*, Jing-Hao Xue, Bolei Zhou*, and Ming-Hsuan Yang*, "GAN Inversion: A Survey", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2022. (IF: 24.314)

[J13] Kunpeng Li, **Yulun Zhang***, Kai Li, Yuanyuan Li, and Yun Fu, "Image-Text Embedding Learning via Visual and Textual Semantic Reasoning", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2022. (IF: 24.314)

[J12] **Yulun Zhang**, Kunpeng Li, Kai Li, Gan Sun, Yu Kong, and Yun Fu, "Accurate and Fast Image Denoising via Attention Guided Scaling", *IEEE Transactions on Image Processing* (**TIP**), 2021. (IF: 11.041)

[J11] Kai Li, Hongfu Liu, **Yulun Zhang**, Kunpeng Li, and Yun Fu, "Self-guided Deep Multi-view Subspace Clustering via Consensus Affinity Regularization", *IEEE Transactions on Cybernetics* (**TCYB**), 2021. (IF: 19.118)

[J10] Haoqian Wang, Xiaowan Hu*, Xiaole Zhao, and **Yulun Zhang**, "Wide Weighted Attention Multi-Scale Network for Accurate MR Image Super-Resolution", *IEEE Transactions on Circuits and Systems for Video Technology* (**TCSVT**), 2021. (IF: 5.859)

[J9] **Yulun Zhang**, Yapeng Tian, Yu Kong, Bineng Zhong, and Yun Fu, "Residual Dense Network for Image Restoration", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2020. (IF: 24.314)

[J8] Kai Li, Zhengming Ding, Kunpeng Li, **Yulun Zhang**, and Yun Fu, "Vehicle and Person Re-Identification with Support Neighbor Loss", *IEEE Transactions on Neural Networks and Learning Systems* (**TNNLS**), 2020. (IF: 14.255)

[J7] Qinqin Zhou, Bineng Zhong, Xiangyuan Lan, Gan Sun, **Yulun Zhang**, Baochang Zhang, and Rongrong Ji, "Fine-Grained Spatial Alignment Model for Person Re-Identication with Focal Triplet Loss", *IEEE Transactions on Image Processing* (**TIP**), 2020. (IF: 11.041)

[J6] Gan Sun, Yang Cong, **Yulun Zhang**, Guoshuai Zhao, and Yun Fu, "Continual Multi-view Task Learning via Deep Matrix Factorization", *IEEE Transactions on Neural Networks and Learning Systems* (**TNNLS**), 2020. (IF: 14.255)

[J5] Xiaole Zhao, **Yulun Zhang**, Tao Zhang, and Xueming Zou, "Channel Splitting Network for Single MR Image Super-Resolution", *IEEE Transactions on Image Processing* (**TIP**), 2019. (IF: 11.041)

[J4] Bineng Zhong, Bing Bai, Jun Li, **Yulun Zhang**, and Yun Fu, "Hierarchical Tracking by Reinforcement Learning based Searching and Coarse-to-fine Verifying", *IEEE Transactions on Image Processing* (**TIP**), 2018. (IF: 11.041)

[J3] Qinqin Zhou, Bineng Zhong, **Yulun Zhang**, Jun Li, and Yun Fu, "Deep Alignment Network Based Multi-person Tracking with Occlusion and Motion Reasoning", *IEEE Transactions Multimedia* (**TMM**), 2018. (IF: 8.182)

[J2] Yongbing Zhang, **Yulun Zhang***, Jian Zhang, Dong Xu, Yun Fu, Xiangyang Ji, and Qionghai Dai, "Collaborative Representation Cascade for Single Image Super-Resolution", *IEEE Transactions on Systems, Man, and Cybernetics: Systems* (**TSMC**), 2017. (IF: 11.471)

[J1] Yongbing Zhang, **Yulun Zhang***, Jian Zhang, and Qionghai Dai, "CCR: Clustering and Collaborative Representation for Fast Single Image Super-Resolution", *IEEE Transactions on Multimedia* (**TMM**), 2015. (IF: 8.182)

Conference Papers

15 CVPR, 15 ICCV, 8 ECCV, 9 ICLR, 10 NeurIPS, 3 ICML, 4 AAAI, 4 IJCAI, 5 ACM MM, 1 ISBI, 1 MICCAI, 1 VCIP, 1 ICDM

[C77] Zheng Chen, **Yulun Zhang***, Jinjin Gu, Linghe Kong*, and Xiaokang Yang, "Recursive Generalization Transformer for Image Super-Resolution", *International Conference on Learning Representations* (**ICLR**), 2024

[C76] Jiale Zhang, **Yulun Zhang***, Jinjin Gu, Jiahua Dong, Linghe Kong*, and Xiaokang Yang, "Xformer: Hybrid X-Shaped Transformer for Image Denoising", *International Conference on Learning Representations* (**ICLR**), 2024

[C75] Chunming He, Kai Li, Yachao Zhang, **Yulun Zhang**, Chenyu You, Zhenhua Guo, Xiu Li, Martin Danelljan, and Fisher Yu, "Strategic Preys Make Acute Predators: Enhancing Camouflaged Object Detectors by Generating Camouflaged Objects", *International Conference on Learning Representations* (**ICLR**), 2024

[C74] Zhengqin Xu, **Yulun Zhang**, Chao Ma, Yichao Yan, Zelin Peng, Shoulie Xie, Shiqian Wu, and Xiaokang Yang, "LERE: Learning-Based Low-Rank Matrix Recovery with Rank Estimation", *The AAAI Conference on Artificial Intelligence* (**AAAI**), 2024.

[C73] Haotong Qin†, **Yulun Zhang**†,*, Yifu Ding, Yifan Liu, Xianglong Liu*, Martin Danelljan, and Fisher Yu, QuantSR: Accurate Low-bit Quantization for Efficient Image Super-Resolution", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2023

[C72] Zheng Chen, **Yulun Zhang***, Ding Liu, Bin Xia, Jinjin Gu, Linghe Kong*, and Xin Yuan, "Hierarchical Integration Diffusion Model for Realistic Image Deblurring", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2023

[C71] Yuanhao Cai, Yuxin Zheng, Jing Lin, Xin Yuan, **Yulun Zhang***, and Haoqian Wang*, "Binarized Spectral Compressive Imaging", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2023

[C70] Chunming He, Kai Li, Yachao Zhang, Guoxia Xu, Longxiang Tang, **Yulun Zhang**, Zhenhua Guo, and Xiu Li, "Weakly-Supervised Concealed Object Segmentation with SAM-based Pseudo Labeling and Multi-scale Feature Grouping", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2023

[C69] Yizhou Wang, Yue Kang, Can Qin, Huan Wang, Yi Xu, **Yulun Zhang**, and Yun Fu, "Momentum is All You Need for Data-Driven Adaptive Optimization", *IEEE International Conference on Data Mining* (**ICDM**), 2023.

[C68] Zichun Wang†, **Yulun Zhang**†, Debing Zhang, and Ying Fu, "Recurrent Self-Supervised Video Denoising with Denser Receptive Field", *ACM International Conference on Multimedia* (**ACM MM**), 2023.

[C67] Hao Shen, Zhongqiu Zhao, **Yulun Zhang**, and Zhao Zhang, "Mutual Information-driven Triple Interaction Network for Efficient Image Dehazing", *ACM International Conference on Multimedia* (**ACM MM**), 2023.

[C66] Zheng Chen, **Yulun Zhang***, Jinjin Gu, Linghe Kong*, Xiaokang Yang, and Fisher Yu, "Dual Aggregation Transformer for Image Super-Resolution", *International Conference on Computer Vision* (**ICCV**), 2023

[C65] Jiamian Wang, Huan Wang, **Yulun Zhang***, Yun Fu, and Zhiqiang Tao*, "Iterative Soft Shrinkage Learning for Efficient Image Super-Resolution", *International Conference on Computer Vision* (**ICCV**), 2023

[C64] Bin Xia, **Yulun Zhang**, Shiyin Wang, Yitong Wang, Xinglong Wu, Yapeng Tian, Wenming Yang, and Luc Van Gool, "DiffIR: Efficient Diffusion Model for Image Restoration", *International Conference on Computer Vision* (**ICCV**), 2023

[C63] Yuanhao Cai, Hao Bian, Jing Lin, Haoqian Wang*, Radu Timofte, and **Yulun Zhang***, "Retinexformer: One-stage Retinex-based Transformer for Low-light Image Enhancement", *International Conference on Computer Vision* (**ICCV**), 2023

[C62] Steven Tel, Zongwei Wu, **Yulun Zhang***, Barth Heyrman, Cedric Demonceaux, Radu Timofte, and Dominique Ginhac, "Alignment-free HDR Deghosting with Semantics Consistent Transformer", *International Conference on Computer Vision* (**ICCV**), 2023

[C61] Miaoyu Li, Ying Fu, Ji Liu, and **Yulun Zhang**, "Pixel Adaptive Deep Unfolding Transformer for Hyperspectral Image Reconstruction", *International Conference on Computer Vision* (**ICCV**), 2023

[C60] Chunming He, Kai Li, Guoxia Xu, **Yulun Zhang**, Runze Hu, Zhenhua Guo, and Xiu Li, "Degradation-Resistant Unfolding Network for Heterogeneous Image Fusion", *International Conference on Computer Vision* (**ICCV**), 2023

[C59] Zixiang Zhao, Haowen Bai, Yuanzhi Zhu, Jiangshe Zhang, Shuang Xu, **Yulun Zhang**, Kai Zhang, Deyu Meng, Radu Timofte, and Luc Van Gool, "DDFM: Denoising Diffusion Model for Multi-Modality Image Fusion", *International Conference on Computer Vision* (**ICCV**), 2023 (**Oral**)

[C58] Zixiang Zhao, Jiangshe Zhang, Xiang Gu, Chengli Tan, Shuang Xu, **Yulun Zhang**, Radu Timofte, and Luc Van Gool, "Spherical Space Feature Decomposition for Guided Depth Map Super-Resolution", *International Conference on Computer Vision* (**ICCV**), 2023

[C57] Longxiang Tang, Kai Li, Chunming He, **Yulun Zhang**, Xiu Li, "Source-Free Domain Adaptive Fundus Image Segmentation with Class-Balanced Mean Teacher", *International Conference on Medical Image Computing and Computer Assisted Intervention* (**MICCAI**), 2023.

[C56] Ruofan Zhang, Jinjin Gu, Haoyu Chen, Chao Dong, **Yulun Zhang**, Wenming Yang, "Crafting Training Degradation Distribution for the Accuracy-Generalization Trade-off in Real-World Super-Resolution", *International Conference on Machine Learning* (**ICML**), 2023.

[C55] Jiezhang Cao, Qin Wang, Yongqin Xian, Yawei Li, Bingbing Ni, Zhiming Pi, Kai Zhang*, **Yulun Zhang***, Radu Timofte, Luc Van Gool, "CiaoSR: Continuous Implicit Attention-in-Attention Network for Arbitrary-Scale Image Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C54] Zichun Wang, Ying Fu, Ji Liu, **Yulun Zhang**, "LG-BPN: Local and Global Blind-Patch Network for Self-Supervised Real-World Denoising", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C53] Miaoyu Li, Ji Liu, Ying Fu, **Yulun Zhang**, Dejing Dou, "Spectral Enhanced Rectangle Transformer for Hyperspectral Image Denoising", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C52] Bin Xia, Jingwen He, **Yulun Zhang**, Yitong Wang, Yapeng Tian, Wenming Yang, Luc Van Gool, "Structured Sparsity Learning for Efficient Video Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C51] Zixiang Zhao, Haowen Bai, Jiangshe Zhang, **Yulun Zhang**, Shuang Xu, Zudi Lin, Radu Timofte, Luc Van Gool, "CDDFuse: Correlation-Driven Dual-Branch Feature Decomposition for Multi-Modality Image Fusion", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C50] Chunming He, Kai Li, Yachao Zhang, Longxiang Tang, **Yulun Zhang**, Zhenhua Guo, Xiu Li, "Camouflaged Object Detection with Feature Decomposition and Edge Reconstruction", *Computer Vision and Pattern Recognition* (**CVPR**), 2023.

[C49] **Yulun Zhang**, Donglai Wei, Richard Schalek, Yuelong Wu, Stephen Turney, Jeff Lichtman, Hanspeter Pfister, and Yun Fu, "High-Throughput Microscopy Image Deblurring with Graph Reasoning Attention Network", *IEEE International Symposium on Biomedical Imaging* (**ISBI**), 2023

[C48] Jiale Zhang, **Yulun Zhang***, Jinjin Gu, Yongbing Zhang, Linghe Kong*, and Xin Yuan, "Accurate Image Restoration with Attention Retractable Transformer", *International Conference on Learning Representations* (**ICLR**), 2023 (**Spotlight**)

[C47] Bin Xia, **Yulun Zhang**, Yitong Wang, Yapeng Tian, Wenming Yang, Radu Timofte, and Luc Van Gool, "Basic Binary Convolution Unit for Binarized Image Restoration Network", *International Conference on Learning Representations* (**ICLR**), 2023

[C46] Bin Xia, **Yulun Zhang**, Yitong Wang, Yapeng Tian, Wenming Yang, Radu Timofte, and Luc Van Gool, "Knowledge Distillation based Degradation Estimation for Blind Super-Resolution", *International Conference on Learning Representations* (**ICLR**), 2023

[C45] Miaoyu Li, Ying Fu, and **Yulun Zhang**, "Spatial-Spectral Transformer for Hyperspectral Image Denoising", *The AAAI Conference on Artificial Intelligence* (**AAAI**), 2023.

[C44] Bin Sun, **Yulun Zhang**, Songyao Jiang, and Yun Fu, "Hybrid Pixel-Unshuffled Network for Lightweight Image Super-Resolution", *The AAAI Conference on Artificial Intelligence* (**AAAI**), 2023.

[C43] Zheng Chen, **Yulun Zhang**, Jinjin Gu, Yongbing Zhang, Linghe Kong, and Xin Yuan, "Cross Aggregation Transformer for Image Restoration", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2022 (**Spotlight**)

[C42] Yuanhao Cai†, Jing Lin†, Haoqian Wang, Xin Yuan, Henghui Ding, **Yulun Zhang**, Radu Timofte, and Luc Van Gool, "Degradation-Aware Unfolding Half-Shuffle Transformer for Spectral Compressive Imaging", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2022

[C41] Jiamian Wang, **Yulun Zhang**, Xin Yuan, Ziyi Meng, and Zhiqiang Tao, "Modeling Mask Uncertainty in Hyperspectral Image Reconstruction", *European Conference on Computer Vision* (**ECCV**), 2022. (**Oral**, 2.7%)

[C40] Yuanhao Cai†, Jing Lin†, Xiaowan Hu, Haoqian Wang, Xin Yuan, **Yulun Zhang**, Radu Timofte, and Luc Van Gool, "Coarse-to-Fine Sparse Transformer for Hyperspectral Image Reconstruction", *European Conference on Computer Vision* (**ECCV**), 2022.

[C39] Jiezhang Cao, Jingyun Liang, Kai Zhang, Wenguan Wang, Qin Wang, **Yulun Zhang**, Hao Tang, and Luc Van Gool, "Towards Interpretable Video Super-Resolution via Alternating Optimization", *European Conference on Computer Vision* (**ECCV**), 2022.

[C38] Jiezhang Cao, Jingyun Liang, Kai Zhang, Yawei Li, **Yulun Zhang***, Wenguan Wang, and Luc Van Gool, "Reference-based Image Super-Resolution with Deformable Attention Transformer", *European Conference on Computer Vision* (**ECCV**), 2022.

[C37] Jinjin Gu, Haoming Cai, Chenyu Dong, Ruofan Zhang, **Yulun Zhang**, Wenming Yang, and Chun Yuan, "Super-Resolution by Predicting Offsets: An Ultra-Efficient Super-Resolution Network for Rasterized Images", *European Conference on Computer Vision* (**ECCV**), 2022.

[C36] Xiaotong Luo, Mingliang Dai, **Yulun Zhang**, Yuan Xie, Ding Liu, Yanyun Qu, Yun Fu, and Junping Zhang, "Adjustable Memory-efficient Image Super-resolution via Individual Kernel Sparsity", *ACM International Conference on Multimedia* (**ACM MM**), 2022.

[C35] Chaowei Fang, Dingwen Zhang, Liang Wang, **Yulun Zhang**, Lechao Cheng, and Junwei Han, "Cross-Modality High-Frequency Transformer for MR Image Super-Resolution", *ACM International Conference on Multimedia* (**ACM MM**), 2022.

[C34] Jing Lin†, Xiaowan Hu†, Yuanhao Cai, Haoqian Wang, Youliang Yan, Xueyi Zou, **Yulun Zhang**, Luc Van Gool, "Unsupervised Flow-Aligned Sequence-to-Sequence Learning for Video Restoration", *International Conference on Machine Learning* (**ICML**), 2022. (21.9%)

[C33] Jing Lin†, Yuanhao Cai†, Xiaowan Hu, Haoqian Wang, Youliang Yan, Xueyi Zou, Henghui Ding, **Yulun Zhang**, Radu Timofte, Luc Van Gool, "Flow-Guided Sparse Transformer for Video Deblurring", *International Conference on Machine Learning* (**ICML**), 2022. (21.9%)

[C32] Yi Xu, Lichen Wang, Yizhou Wang, Can Qin, **Yulun Zhang**, and Yun Fu, "MemREIN: Rein the Domain Shift for Cross-Domain Few-Shot Learning", *International Joint Conferences on Artificial Intelligence* (**IJCAI**), 2022 (**Short paper, 15%**)

[C31] Huang Wang, Can Qin, Yue Bai, **Yulun Zhang**, and Yun Fu, "Recent Advances on Neural Network Pruning at Initialization", *International Joint Conferences on Artificial Intelligence* (**IJCAI**), 2022 (**Survey Track, 18%**)

[C30] Yuanhao Cai, Jing Lin, Xiaowan Hu, Haoqian Wang, Xin Yuan, **Yulun Zhang**, Radu Timofte, Luc Van Gool, "Mask-guided Spectral-wise Transformer for Efficient Hyperspectral Image Reconstruction", *Computer Vision and Pattern Recognition* (**CVPR**), 2022.

[C29] Xiaowan Hu, Yuanhao Cai, Jing Lin, Haoqian Wang, Xin Yuan, **Yulun Zhang**, Radu Timofte, Luc Van Gool, "HDNet: High-resolution Dual-domain Learning for Spectral Compressive Imaging", *Computer Vision and Pattern Recognition* (**CVPR**), 2022.

[C28] Salma Abdel Magid, Zudi Lin, Donglai Wei, **Yulun Zhang**, Jinjin Gu, and Hanspeter Pfister, "Texture-based Error Analysis for Image Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2022.

[C27] **Yulun Zhang**†, Huang Wang†,*, Can Qin, and Yun Fu, "Learning Efficient Image Super-Resolution Networks via Structure-Regularized Pruning", *International Conference on Learning Representations* (**ICLR**), 2022

[C26] **Yulun Zhang**†, Huang Wang†,*, Can Qin, and Yun Fu, "Aligned Structured Sparsity Learning for Efficient Image Super-Resolution", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2021 (**Spotlight, 3%**)

[C25] Yuanhao Cai, Xiaowan Hu, Haoqian Wang*, **Yulun Zhang**, Hanspeter Pfister, and Donglai Wei, "Learning to Generate Realistic Noisy Images via Pixel-level Noise-aware Adversarial Training", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2021

[C24] Can Qin, Handong Zhao, Lichen Wang, Huan Wang, **Yulun Zhang**, and Yun Fu, "Slow Learning and Fast Inference: Efficient Graph Similarity Computation via Knowledge Distillation", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2021 (Poster, 26%)

[C23] **Yulun Zhang**, Donglai Wei, Can Qin, Huan Wang*, Hanspeter Pfister, and Yun Fu, "Context Reasoning Attention Network for Image Super-Resolution", *International Conference on Computer Vision* (**ICCV**), 2021

[C22] Salma Abdel Magid, **Yulun Zhang**, Donglai Wei, Won-Dong Jang, Zudi Lin, Yun Fu, and Hanspeter Pfister, "Dynamic High-Pass Filtering and Multi-Spectral Attention for Image Super-Resolution", *International Conference on Computer Vision* (**ICCV**), 2021

[C21] Kai Li, Chang Liu, Handong Zhao, **Yulun Zhang**, and Yun Fu, "ECACL: A Holistic Framework for Semi-Supervised Domain Adaptation", *International Conference on Computer Vision* (**ICCV**), 2021

[C20] Xiaowan Hu, Yuanhao Cai, Zhihong Liu, Haoqian Wang, and **Yulun Zhang**, "Multi-Scale Selective Feedback Network with Dual Loss for Real Image Denoising", *International Joint Conferences on Artificial Intelligence* (**IJCAI**), 2021. (**Oral, 13.9%**)

[C19] **Yulun Zhang**, Kai Li, Kunpeng Li, and Yun Fu, "MR Image Super-Resolution with Squeeze and Excitation Reasoning Attention Network", *Computer Vision and Pattern Recognition* (**CVPR**), 2021.

[C18] Xiaowan Hu, Ruijun Ma, Zhihong Liu, Yuanhao Cai, Xiaole Zhao, **Yulun Zhang**, and Haoqian Wang, "Pseudo 3D Auto-Correlation Network for Real Image Denoising", *Computer Vision and Pattern Recognition* (**CVPR**), 2021.

[C17] Huan Wang, Can Qin, **Yulun Zhang***, and Yun Fu, "Neural Pruning via Growing Regularization", *International Conference on Learning Representations* (**ICLR**), 2021.

[C16] Yuchen Fan, Jiahui Yu, Yiqun Mei, **Yulun Zhang**, Yun Fu, Ding Liu, Thomas S Huang, "Neural Sparse Representation for Image Restoration", *Advances in Neural Information Processing Systems* (**NeurIPS**), 2020.

[C15] **Yulun Zhang**, Zhifei Zhang, Stephen DiVerdi, Zhaowen Wang, Jose Echevarria, and Yun Fu, "Texture Hallucination for Large-Factor Painting Super-Resolution", *European Conference on Computer Vision* (**ECCV**), 2020.

[C14] Xiaotong Luo, Yuan Xie, **Yulun Zhang**, Yanyun Qu, Cuihua Li, and Yun Fu, "LatticeNet: Towards Lightweight Image Super-resolution with Lattice Block", *European Conference on Computer Vision* (**ECCV**), 2020.

[C13] Kai Li, **Yulun Zhang**, Kunpeng Li, and Yun Fu, "Adversarial Feature Hallucination Networks for Few-Shot Learning", *Computer Vision and Pattern Recognition* (**CVPR**), 2020.

[C12] Yapeng Tian, **Yulun Zhang**, Yun Fu, and Chenliang Xu, "TDAN: Temporally Deformable Alignment Network for Video Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2020.

[C11] Xiaoyu Xiang[†], Yapeng Tian[†], **Yulun Zhang**, Yun Fu, Jan Allebach[‡], and Chenliang Xu[‡], "Zooming Slow-Mo: Fast and Accurate One-Stage Space-Time Video Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2020.

[C10] Yu Yin, Joseph Robinson, **Yulun Zhang**, and Yun Fu, "Joint Super-Resolution and Alignment of Tiny Faces", *The AAAI Conference on Artificial Intelligence* (**AAAI**), 2020.

[C9] **Yulun Zhang**, Chen Fang, Yilin Wang, Zhaowen Wang, Zhe Lin, Yun Fu, and Jimei Yang, "Multimodal Style Transfer via Graph Cuts", *International Conference on Computer Vision* (**ICCV**), 2019.

[C8] Kunpeng Li, **Yulun Zhang**, Kai Li, Yuanyuan Li, and Yun Fu, "Visual Semantic Reasoning for Image-Text Matching", *International Conference on Computer Vision* (**ICCV**), 2019. (**Oral, 4.3%**)

[C7] Kunpeng Li, **Yulun Zhang**, Kai Li, Yuanyuan Li, and Yun Fu, "Attention Bridging Network for Knowledge Transfer", *International Conference on Computer Vision* (**ICCV**), 2019.

[C6] Qinqin Zhou, Bineng Zhong, Xiangyuan Lan, Gan Sun, **Yulun Zhang**, Mengran Gou, "LRDNN: Local-refining based Deep Neural Network for Person Re-Identification with Attribute Discerning", *International Joint Conference on Artificial Intelligence* (**IJCAI**), 2019. (**Oral, 13.7%**)

[C5] **Yulun Zhang**, Kunpeng Li, Kai Li, Bineng Zhong, and Yun Fu, "Residual Non-local Attention Networks for Image Restoration", *International Conference on Learning Representations* (**ICLR**), 2019.

[C4] **Yulun Zhang**, Kunpeng Li, Kai Li, Lichen Wang, Bineng Zhong, and Yun Fu, "Image Super-Resolution Using Very Deep Residual Channel Attention Networks", *European Conference on Computer Vision* (**ECCV**), 2018.

[C3] **Yulun Zhang**, Yapeng Tian, Yu Kong, Bineng Zhong, and Yun Fu, "Residual Dense Network for Image Super-Resolution", *Computer Vision and Pattern Recognition* (**CVPR**), 2018. (**Spotlight, 6.6%**)

[C2] Kai Li, Zhengming Ding, Kunpeng Li, **Yulun Zhang**, and Yun Fu, "Support Neighbor Loss for Person Re-Identification", *ACM International Conference on Multimedia* (**ACM MM**), 2018.

[C1] **Yulun Zhang**, Yongbing Zhang, Jian Zhang, Haoqian Wang, and Qionghai Dai, "Adaptive Local Nonparametric Regression for Fast Single Image Super-Resolution", *IEEE International Conference on Visual Communications and Image Processing* (**VCIP**), 2015. (**Best Student Paper Award**)

Workshop Papers
6 CVPR Workshop, 1 ICCV Workshop

[W7] **Yulun Zhang**, Kai Zhang, Zheng Chen, Yawei Li, Radu Timofte, and others, "NTIRE 2023 challenge on image super-resolution (x4): Methods and results", *CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on image super-resolution (×4)* (**CVPR Workshop**), 2023.

[W6] Yawei Li, **Yulun Zhang**, Radu Timofte, Luc Van Gool, and others, "NTIRE 2023 challenge on efficient super-resolution: Methods and results", *CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on efficient super-resolution* (**CVPR Workshop**), 2023.

[W6] Yawei Li, **Yulun Zhang**, Radu Timofte, Luc Van Gool, and others, "NTIRE 2023 challenge on image denoising: Methods and results", *CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on image denoising* (**CVPR Workshop**), 2023.

[W4] Xiaohong Liu, Xiongkuo Min, Wei Sun, **Yulun Zhang**, Kai Zhang, Radu Timofte, Guangtao Zhai, Yixuan Gao, Yuqin Cao, Tengchuan Kou, Yunlong Dong, Ziheng Jia, and others, "NTIRE 2023 Quality Assessment of Video Enhancement Challenge", *CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on Quality Assessment of Video Enhancement* (**CVPR Workshop**), 2023.

[W3] Yuanhao Cai, Jing Lin, Zudi Lin, Haoqian Wang, **Yulun Zhang**, Hanspeter Pfister, Radu Timofte, and Luc Van Gool, "MST++: Multi-stage Spectral-wise Transformer for Efficient Spectral Reconstruction", *IEEE CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on Spectral Reconstruction from RGB* (**CVPR Workshop**), 2022. (**First Place Award**)

[W2] Can Qin, Lichen Wang, **Yulun Zhang**, and Yun Fu, "Generatively Inferential Co-Training for Unsupervised Domain Adaptation", *IEEE ICCV Real-World Recognition from Low-Quality Images and Videos (RLQ) workshop* (**ICCV Workshop**), 2019. (**Best Paper Award**)

[W1] Radu Timofte, ..., **Yulun Zhang**, ..., et al., "NTIRE 2017 Challenge on Single Image Super-Resolution: Methods and Results", *IEEE CVPR New Trends in Image Restoration and Enhancement (NTIRE) workshop and challenge on image super-resolution* (**CVPR Workshop**), 2017. (**Second Place Award**)

Patent Applications

[P3] **Yulun Zhang**, Zhifei Zhang, Stephen DiVerdi, Zhaowen Wang, and Jose Echevarria, "Texture Hallucination for Large-Scale Painting Super-Resolution", Filed by Adobe Systems Incorporated, 2020

[P2] Chen Fang, Zhe Lin, Zhaowen Wang, **Yulun Zhang**, Yilin Wang, and Jimei Yang, "Transferring Image Style to Content of a Digital Image", Filed by Adobe Systems Incorporated, 2019

[P1] Chen Fang, Zhe Lin, Zhaowen Wang, **Yulun Zhang**, Yilin Wang, and Jimei Yang, "Hierarchical Scale Matching and Patch Estimation for Image Style Transfer with Arbitrary Resolution", Filed by Adobe Systems Incorporated, 2019

Academic Service

Area Chair

- Computer Vision and Pattern Recognition (CVPR), 2023-2024
- International Conference on Computer Vision (ICCV), 2023
- European Conference on Computer Vision (ECCV), 2024
- Advances in Neural Information Processing Systems (NeurIPS), 2023
- International Conference on Learning Representations (ICLR), 2024
- International Conference on Machine Learning (ICML), 2024
- ACM International Conference on Multimedia (ACM MM), 2024
- International Joint Conferences on Artificial Intelligence (IJCAI), 2024
- Chinese Conference on Pattern Recognition and Computer Vision (PRCV), 2024

Senior Program Committee

- International Joint Conferences on Artificial Intelligence (IJCAI), 2021-2023
- AAAI Conference on Artificial Intelligence (AAAI), 2023-2024

Workshop Co-Organizer

- New Trends in Image Restoration and Enhancement workshop (NTIRE), CVPR 2022-2023

Program Committee or Reviewer

- Computer Vision and Pattern Recognition (CVPR), 2019-2022
- International Conference on Computer Vision (ICCV), 2019/2021
- European Conference on Computer Vision (ECCV), 2020-2022
- International Conference on Learning Representations (ICLR), 2020-2023
- Advances in Neural Information Processing Systems (NeurIPS), 2020-2022
- International Conference on Machine Learning (ICML), 2021-2023
- AAAI Conference on Artificial Intelligence (AAAI), 2019-2022
- International Joint Conferences on Artificial Intelligence (IJCAI), 2020
- ACM International Conference on Multimedia (ACM MM), 2021-2023
- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2020-2023

Associate Editor

- Multimedia Tools and Applications (MTAP), 2023-
- Visual Intelligence, 2024-

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Multimedia (TMM)
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- IEEE Transactions on Cybernetics (TCYB)
- IEEE Transactions on Geoscience and Remote Sensing (TGRS)
- IEEE Transactions on Computational Imaging (TCI)
- IEEE Transactions on Medical Imaging (TMI)
- IEEE Transactions on Broadcasting
- IEEE Transactions on Cognitive and Developmental Systems (TCDS)
- IEEE Transactions on Intelligent Transportation Systems (TITS)
- ACM Transactions on Intelligent Systems and Technology (TIST)
- Pattern Recognition (PR)
- Information Fusion (INFFUS)
- Computer Vision and Image Understanding (CVIU)
- Neurocomputing (NEUCOM)

Mentoring Experience

Ph.D. Students

- Jiezhang Cao, EE@ETH Zürich, Switzerland — Oct. 2021 - Now
  Topics: image and video restoration
  First-author papers: 2 ECCV'22 [C38, C39], CVPR'23 [C55]
  Research co-advised with Prof. Luc Van Gool
- Jiamian Wang, CS@Rochester Institute of Technology, USA — Jun. 2021 - Now
  Topics: hyperspectral image reconstruction
  First-author papers: ECCV'22 [C41], ICCV'23 [C65]
  Research co-advised with Prof. Zhiqiang Tao
- Salma Abdel Magid, CS@Harvard University, USA — Apr. 2020 - Now
  Topics: interpretability, adversarial robustness, and image super-resolution
  First-author papers: ICCV'21 [C22], CVPR'22 [C28]
  Research co-advised with Prof. Hanspeter Pfister
- Xiaowan Hu, AI@Tsinghua University, China — Apr. 2019 - Now
  Topics: biomedical image analyses, and image denoising
  First-author papers: TCSVT'21 [J10], IJCAI'21 [C20], CVPR'21 [C18], CVPR'22 [C29]
  Research co-advised with Prof. Haoqian Wang

Master Students

- Zichun Wang, CS@Beijing Institute of Technology, China — Dec. 2021 - Now
  Topics: image denoising
  First-author papers: CVPR'23 [C54], ACM MM'23 [C68]
  Research co-advised with Prof. Ying Fu
- Miaoyu Li, CS@Beijing Institute of Technology, China — Dec. 2021 - Now
  Topics: hyperspectral image reconstruction
  First-author papers: AAAI'23 [C45], CVPR'23 [C53], ICCV'23 [C61]
  Research co-advised with Prof. Ying Fu
- Jiale Zhang, CS@Shanghai Jiao Tong University, China — Feb. 2022 - Now
  Topics: image restoration
  First-author papers: ICLR'22 [C48], ICLR'24 [C76]
  Research co-advised with Prof. Linghe Kong
- Zheng Chen, CS@Shanghai Jiao Tong University, China — Dec. 2021 - Now
  Topics: image restoration
  First-author papers: NeurIPS'22 [C43], ICCV'23 [C66], NeurIPS'23 [C72], ICLR'24 [C77]
  Research co-advised with Prof. Linghe Kong
- Yuanhao Cai, AI@Tsinghua University, China — Sept. 2020 - Now
  Topics: denoising, image generation, video deblurring, and hyperspectral image reconstruction
  First-author papers: NeurIPS'21 [C25], CVPR'22 [C30], ECCV'22 [C40], NeurIPS'22 [C42], ICCV'23 [C63], NeurIPS'23 [C71]
  Research co-advised with Prof. Haoqian Wang
- Jing Lin, AI@Tsinghua University, China — Sept. 2020 - Now
  Topics: video restoration and hyperspectral image reconstruction
  First-author papers: 2 ICML'22 [C33, C34]
  Research co-advised with Prof. Haoqian Wang

Invited Talks

- "Enhance deep CNN features for image restoration and synthesis",
  Harvard University, Apr 2021
  ETH Zürich, Jul 2021
  Xidian University, Oct 2021
  Max Planck Institute for Informatics, May 2022
- "Learning for image restoration and synthesis",
  Tsinghua University, Sep 2020, Jun 2021
  Xidian University, Jul 2020
  Rochester Institute of Technology, May 2020
- "Residual dense network for image super-resolution",
  IEEE CVPR, Salt Lake City, Utah, Jun 2018
- "Adaptive local nonparametric regression for fast single image super-resolution",
  IEEE International Conference on Visual Communications and Image Processing, Singapore, Dec 2015
- "Single image super-resolution via iterative collaborative representation",
  Pacific-Rim Conference on Multimedia, Gwangju, Korea, Sep 2015
- "Single depth image super resolution via a dual sparsity model",
  IEEE International Conference on Multimedia and Expo, Torino, Italy, Jun 2015

Skills

- Programming: Python, C/C++, Matlab, Lua, LaTeX, Visual Studio, OpenCV, Linux.
- Deep learning tools: PyTorch, TensorFlow, Caffe, Torch, Keras, MatConvNet.