Jinjin Gu

Curriculum Vitae

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Research Interests

I study **computer vision**, **image processing**. I am also interested in the **interpretability of deep learning algorithms** and the **applications of machine learning in industrial**.

Education

2020 – 2023 **The University of Sydney**.
Doctor of Philosophy, School of Electrical and Information Engineering.
Advisor: Prof. Wanli Ouyang and Prof. Luping Zhou

2015 – 2020 **The Chinese University of Hong Kong, Shenzhen**.
Bachelor of Engineering, Computer Science and Engineering.

Selected Publications

Google Scholar Citations: 3300+ (up to Aug. 2022)

CVPR 2021 **Interpreting Super-Resolution Networks with Local Attribution Maps**.
Jinjin Gu, Chao Dong

ECCV 2020 **PIPAL: a Large-Scale Image Quality Assessment Dataset for Perceptual Image Restoration**.
Jinjin Gu, Haoming Cai, Haoyu Chen, Xiaoxing Ye, Jimmy S. Ren, Chao Dong

CVPR 2020 **Image Processing Using Multi-Code GAN Prior**.
Jinjin Gu, Yujun Shen, Bolei Zhou

CVPR 2019 **Blind Super-Resolution with Iterative Kernel Correction**.
Jinjin Gu, Hannan Lu, Wangmeng Zuo, Chao Dong

Selected Projects

SenseSR - Intelligent Photography Solution for Mobile Devices.
Research at SenseTime Research, 2018
Denoising and super-resolution of multiple unaligned observation pictures with unknown noise and unknown blur under the limited computing conditions and time constraints on mobile devices.
The research results have been successfully commercialized.

Work Experience

2022.7 – present **Shanghai AI Laboratory**, *Research Intern*, Shanghai.
Supervisor: Prof. Chao Dong

2021.4 – 2022.7 **Shenzhen Institute of Artificial Intelligence and Robotics for Society (AIRS)**, *Research Assistant, Part-time*, Shenzhen.
Advisor: Prof. Junhua Zhao.

2020.8 – 2022.3 **SenseTime Research.**, *Research Intern*, Shenzhen.
Supervisor: Dr. Jimmy S. Ren.

2020.2 – 2020.8 **Applied Research Center, PCG, Tencent.**, *Research Intern*, Shenzhen.
Supervisor: Dr. Ying Shan.

2019.11 – 2022.4 **Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences**, *Research Assistant*, Shenzhen.
Advisor: Prof. Chao Dong.

2019.4 – 2019.11 **The Chinese University of Hong Kong**, *Research Assistant*, Hong Kong.
Advisor: Prof. Bolei Zhou

2017.11 – 2019.5 **SenseTime Research**, *Research Intern*, Shenzhen.
Supervisor: Prof. Chao Dong, Prof. Liang Lin and Dr. Jimmy S. Ren

2017.6 – 2017.8 **Shanghai Jiao Tong University**, *Research Assistant*, Shanghai.
Advisor: Prof. Xiaolin Wu.

Professional Activities

Event Organizer

Co-organizer New Trends in Image Restoration and Enhancement workshop (**NTIRE**) @ CVPR 2021
New Trends in Image Restoration and Enhancement workshop (**NTIRE**) @ CVPR 2022

Organizer TIANCHI Smart Energy Super-Resolution Perception Challenge

Reviewer

Conference Conference on Computer Vision and Pattern Recognition (**CVPR**), 2021, 2022
European Conference on Computer Vision (**ECCV**), 2020, 2022
International Conference on Computer Vision (**ICCV**), 2021
International Conference on Machine Learning (**ICML**), 2021, 2022
Conference on Neural Information Processing Systems (**NeurIPS**), 2020 – 2022
International Conference on Learning Representations (**ICLR**), 2021 – 2023
Association for the Advancement of Artificial Intelligence (**AAAI**), 2022 – 2023
International Joint Conference on Artificial Intelligence (**IJCAI**), 2022
Winter Conference on Applications of Computer Vision (**WACV**), 2022

Journal IEEE, Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)
IEEE, Transactions on Image Processing (**TIP**)
IEEE, Transactions on Multimedia (**TMM**)
IEEE, Transactions on Circuits and Systems for Video Technology (**TCSVT**)
IEEE, Transactions on Cybernetics (**TCYB**)
IEEE, Transactions on Systems, Man and Cybernetics (**TSMC**)
IEEE, Journal of Selected Topics in Signal Processing (**JSTSP**)
IEEE, Sensors Journal
ACM, Transactions on Multimedia Computing, Communications and Applications (**TOMM**)
Springer, International Journal of Computer Vision (**IJCV**)
Springer, The Visual Computer (**TVCJ**)
Elsevier, Computer Vision and Image Understanding (**CVIU**)
Public Library of Science, **PLoS One**

Talks

General Low-Level Vision and Its Interpretability.
Invited Talk at Long Feng Science Forum from CUHK-Shenzhen, 2022.8
Invited Talk at Huawei, Shanghai, 2022.8

Interpreting Super-Resolution Networks.
Invited Talk at Student Forum on Frontiers of AI (SFFAI), Shenzhen, 2021.9

Evaluating and Interpreting Super-Resolution Networks.
Invited Talk at Huawei 2012 Lab, Shenzhen, 2021.6
Invited Talk at Kuai Shou, 2022.6

NTIRE 2022 Challenge on Perceptual Image Quality Assessment.
Spotlight talk at NTIRE 2022 Workshop, CVPR 2022. 2022.6.

NTIRE 2021 Challenge on Perceptual Image Quality Assessment.
Spotlight talk at NTIRE 2021 Workshop, CVPR 2021. 2021.6.

Image Processing Applications: Challenges and Opportunities.
Invited talk at Tsinghua Shenzhen International Graduate School, 2021.5.

Interpreting Super-Resolution Networks with Local Attribution Maps.
Invited talk at Extreme Mart, Shenzhen, 2021.3.
Invited talk at CSIG-Guangdong Province CVPR 2021 Online Academic Report, 2021.5.
Invited talk at Tsinghua AI TIME Online Academic Report, 2021.7.

Two-phase Hair Image Synthesis by Self-Enhancing Generative Model.
Oral talk at Pacific Graphics 2019. Korea University, Seoul, Korea, 2019.

Suppressing Model Overfitting for Image Super-Resolution Networks.
Spotlight talk at NTIRE 2019 Workshop, CVPR 2019. Long Beach, California, USA, 2019

New Trends On Single Image Super-Resolution.
Invited talk at the Chinese University of Hong Kong, Shenzhen. Shenzhen, China, 2019

ESRGAN: Enhanced Super-Resolution Generative Adversarial Networks.
Spotlight talk at PIRM 2018 Workshop, ECCV 2018. TUM, Munich, Germany, 2018

Honors and Awards

2022 Winner of NTIRE 2022 Efficient SR Challenge, Model Complexity Track, CVPR 2022
2019 Winner of NTIRE Real-Image SR Challenge, CVPR 2019
2019 SenseTime Scholarship (Top 29 students selected from across China)
2018 Champion of PIRM SR Challenge, the perceptual track, ECCV 2018
2018 Sensetime Outstanding Research Intern
2018 Sensetime Research Intern Star

Full Publication List

Papers

* indicates equal contribution, and ✉ indicates corresponding author

[21] **Blind Image Super-Resolution: A Survey and Beyond**.
Anran Liu, Yihao Liu, Jinjin Gu, Yu Qiao, Chao Dong
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2022

[20] **Efficient Image Super-Resolution using Vast-Receptive-Field Attention**.
Lin Zhou*, Haoming Cai*, Jinjin Gu, Zheyuan Li, Yingqi Liu, Xiangyu Chen, Yu Qiao, Chao Dong
European Conference on Computer Vision Workshop (**ECCVW**), 2022

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

[18] **Rethinking the Pipeline of Demosaicing, Denoising and Super-Resolution**.
Guocheng Qian*, Yuanhao Wang*, Chao Dong, Jimmy S Ren, Wolfgang Heidrich, Bernard Ghanem, Jinjin Gu ✉
International Conference on Computational Photography (**ICCP**) Oral, 2022

[17] **AI-Enabled Image Fraud in Scientific Publications**.
Jinjin Gu, Xinlei Wang, Chenang Li, Junhua Zhao, Weijin Fu, Gaoqi Liang, Jing Qiu
Patterns, Cell Press, volume 3, issue 7, 100511, July 08, 2022.

[16] **Blueprint Separable Residual Network for Lightweight Image Super-Resolution**.
Zheyuan Li*, Yingqi Liu*, Xiangyu Chen, Haoming Cai, Jinjin Gu, Yu Qiao, Chao Dong
Computer Vision and Pattern Recognition Workshop (**CVPRW**), 2022
Winner, Model Complexity Track in the NTIRE 2022 Efficient SR Challenge, CVPR2022

[15] **NTIRE 2022 Challenge on Perceptual Image Quality Assessment**.
Jinjin Gu, Haoming Cai, Chao Dong, Jimmy S. Ren, Radu Timofte
Computer Vision and Pattern Recognition Workshop (**CVPRW**), 2022

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

[13] **Reflash Dropout in Image Super-Resolution**.
Xiangtao Kong*, Xina Liu*, Jinjin Gu, Yu Qiao, Chao Dong
Computer Vision and Pattern Recognition (**CVPR**), 2022

[12] **Electricity-Consumption Data Reveals the Economic Impact and Industry Recovery during the Pandemic**.
Xinlei Wang*, Caomingzhe Si*, Jinjin Gu, Guolong Liu, Wenxuan Liu, Jing Qiu, Junhua Zhao
Scientific Reports, Volume 11 (19960), 2021

[11] **NTIRE 2021 Challenge on Perceptual Image Quality Assessment**.
Jinjin Gu, Haoming Cai, Chao Dong, Jimmy S. Ren, Shuhang Gu, Radu Timofte
Computer Vision and Pattern Recognition Workshop (**CVPRW**), 2021

[10] **Interpreting Super-Resolution Networks with Local Attribution Maps**.
Jinjin Gu, Chao Dong
Computer Vision and Pattern Recognition (**CVPR**), 2021

[9] **PIPAL: a Large-Scale Image Quality Assessment Dataset for Perceptual Image Restoration**.
Jinjin Gu, Haoming Cai, Haoyu Chen, Xiaoxing Ye, Jimmy S. Ren, Chao Dong
European Conference on Computer Vision (**ECCV**), 2020

[8] **Super Resolution Perception for Improving Data Completeness in Smart Grid State Estimation**.
Gaoqi Liang, Guolong Liu, Junhua Zhao, Yanli Liu, Jinjin Gu, Guang-Zhong Sun, Zhaoyang Dong
Engineering, Volume 6, Issue 7, July 2020, Pages 789-800

[7] **Super Resolution Perception for Smart Meter Data**.
Guolong Liu, Jinjin Gu, Fushuan Wen, Gaoqi Liang, Junhua Zhao
Information Sciences, Volume 526, July 2020, Pages 263-273.

[6] **Image Processing Using Multi-Code GAN Prior**.
Jinjin Gu, Yujun Shen, Bolei Zhou
Computer Vision and Pattern Recognition (**CVPR**), 2020

[5] **Interpreting the Latent Space of GANs for Semantic Image Editing**.
Yujun Shen, Jinjin Gu, Xiaoou Tang, Bolei Zhou
Computer Vision and Pattern Recognition (**CVPR**), 2020

[4] **Two-phase Hair Image Synthesis by A Self-Enhancing Generative Model**.
Haonan Qiu, Chuan Wang, Hang Zhu, Xiangyu Zhu, Jinjin Gu, Xiaoguang Han
Computer Graphics Forum, Volume 38 (2019), Number 7, In Pacific Graphics (**PG**), 2019, Oral

[3] **Blind Super-Resolution with Iterative Kernel Correction**.
Jinjin Gu, Hannan Lu, Wangmeng Zuo, Chao Dong
Computer Vision and Pattern Recognition (**CVPR**), 2019

[2] **Suppressing Model Overfitting for Image Super-Resolution Networks**.
Ruicheng Feng, Jinjin Gu, Chao Dong, Yu Qiao
Computer Vision and Pattern Recognition Workshop (**CVPRW**), 2019, Spotlight
Winner, the NTIRE Real-Image SR Challenge, CVPR2019

[1] **ESRGAN: Enhanced Super-Resolution Generative Adversarial Networks**.
Xintao Wang, Ke Yu, Shixiang Wu, Jinjin Gu, Yihao Liu, Chao Dong, Chen Change Loy, Yu Qiao
European Conference on Computer Vision Workshop (**ECCVW**), 2018, Spotlight
Champion, Region 3 in the PIRM2018-SR Challenge, ECCV2018

Manuscripts

Image Quality Assessment for Perceptual Image Restoration: A New Dataset, Benchmark and Metric.
Jinjin Gu, Haoming Cai, Haoyu Chen, Xiaoxing Ye, Jimmy S. Ren, Chao Dong

Local Attribution Maps for Visualizing and Interpreting Super-Resolution Networks.
Jinjin Gu, Chao Dong

Evaluating the Generalization Ability of Super-resolution Networks.
Yihao Liu, Hengyuan Zhao, Jinjin Gu, Yu Qiao, Chao Dong

Accurate Image Restoration with Attention Retractable Transformer.
Jiale Zhang, Yulun Zhang, Jinjin Gu, Yongbing Zhang, Linghe Kong, Xin Yuan

A Comprehensive Evaluation Protocol for Real-World Super-Resolution Networks.
Wenlong Zhang, Jinjin Gu, Yu Qiao, Chao Dong

Crafting Training Degradation Distribution for the Accuracy-Generalization Trade-off in Real-World Super-Resolution.
Ruofan Zhang, Jinjin Gu ✉, Chao Dong, Jieming Li, Wenming Yang

Mitigating Artifacts in Real-World Video Super-Resolution Models with More Cheap Hidden States and Selective Cross Attention.
Liangbin Xie, Xintao Wang, Shuwei Shi, Jinjin Gu, Chao Dong, Ying Shan