Haoran Bai

PH.D. Candidate

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Thanks for your attention. I am currently pursuing my Ph.D. degree in the School of Computer Science and Engineering, Nanjing University of Science and Technology, China. I am a member of Intelligent Media Analysis Group (IMAG) and advised by Prof. Jinshan Pan. My research interest includes image/video super-resolution, deblurring, dehazing and other restoration tasks.

Publications

Self-Guided Image Dehazing Using Progressive Feature Fusion **IEEE TIP 2022**
***Haoran Bai**, Jinshan Pan, Xinguang Xiang, and Jinhui Tang* *Dec. 2021*
- We explore the properties of hazy images and propose an effective self-guided schema for single image dehaing.
- A progressive feature fusion module is proposed for better exploring the guidance information from the reference images.
- We demonstrate the effect of the proposed algorithm on image dehazing and show that it performs favorably against state-of-the-art methods on the widely-used dehazing benchmark datasets as well as real-world hazy images.

Deep Blind Video Super-resolution **In Proceedings of ICCV 2021**
*Jinshan Pan, **Haoran Bai**, Jiangxin Dong, Jiawei Zhang, and Jinhui Tang* *Jul. 2021*
- We propose an effective blind video SR algorithm that simultaneously estimates blur kernels, motion fields, and latent images.
- An effective image deconvolution method based on the image formation of video SR is developed to explore sharp features for better HR video restoration.
- We formulate the proposed algorithm into an end-to-end trainable network and show that it performs favorably against state-of-the-art methods on both benchmark datasets and real-world videos.

Learning a cascaded non-local residual network for super-resolving blurry images **In Proceedings of CVPRW 2021**
***Haoran Bai**, Songsheng Cheng, Jinhui Tang, and Jinshan Pan* *Apr. 2021*
- We develop a cascaded neural network to jointly solve the deblurring and SR problems in an unified manner.
- A non-local residual network with the progressive upsampling mechanism is developed for the SR module to boost the performance of blurry image SR.
- Both quantitative and qualitative results on the benchmarks demonstrate the effectiveness of the proposed method, and it achieves Top-3 performance on the low-resolution track of the NTIRE 2021 Image Deblurring Challenge.

Cascaded Deep Video Deblurring Using Temporal Sharpness Prior **In Proceedings of CVPR 2020**
*Jinshan Pan, **Haoran Bai**, and Jinhui Tang* *Feb. 2020*
- We propose a compact deep CNN model that simultaneously estimates the optical flow and latent frames for video deblurring.
- To better explore the properties of consecutive frames, we develop a temporal sharpness prior to constrain deep CNN models.
- We quantitatively and qualitatively evaluate the proposed algorithm on benchmark datasets and real-world videos and show that it performs favorably against state-of-the-art methods in terms of accuracy and model size.

Projects

Towards Real-world Face Image Super-resolution **Oct. 2020 – Nov. 2021**
Cooperation with Huawei Technologies Co., Ltd. Hangzhou Research Institute
- Design a new paired data acquisition system to model the degradation process in real-world surveillance scenarios.
- Develop a deep CNN model constrained by the feature-based SVLRM to solve the face SR problem.
- Propose an effective contrastive constraint based on face recognition to improve the accuracy of intelligence applications..

Video Enhancement Technology **May. 2019 – Present**
Cooperation with Huawei Technologies Co., Ltd. Shenzhen Research Institute
- Long-term academic research on video enhancement tasks.
- Propose an effective blind video SR method for improving the generalization ability in real applications.
- Design a self-supervised learning-based method to solve the blind video SR problem when paired training data are unavailable.

Education

PH.D. Candidate in Computer Science and Technology, *Nanjing University of Science and Technology* Sep. 2018 – Exp. Jun. 2023
Bachelor of Engineering in Software Engineering, *Changzhou University* Sep. 2014 – Jun. 2018

Activities

Be invited as a reviewer for IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) Dec. 2021
Be invited as a reviewer for IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Nov. 2021
First-Class Scholarship of Nanjing University of Science and Technology Sep. 2018 – Sep. 2021
Top-3 on the low-resolution track of the NTIRE 2021 Image Deblurring Challenge Apr. 2021

Skills

Programming	Python, Pytorch, TensorFlow, Java, C/C++, SQL, Latex, MarkDown
Certification	Software Designer, CCF CSP (Top 9.49%)
Communication	Chinese, English