Chao Qu

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Research Interests

Infrared degradation modeling based on generative models, Image and video enhancement, Self-supervised learning for low-level vision, Multi-sensor fusion imaging, Neuromorphic imaging including event camera and spike camera.

Education

Nanjing University of Science and Technology (NJUST), Nanjing, China 2020 – Present

M.S. & Ph.D. in Optical Engineering, expected May 2026

Nanjing University of Science and Technology (NJUST), Nanjing, China 2015 – 2019

B.S. in Electronic Science and Technology

Publications

- Chao Qu, *et al.* "Frequency-aware Degradation Modeling for Real-world Thermal Image Super-resolution," ***Entropy***, 2024. [JCR Q2, Accepted].
- Chao Qu, *et al.* "Physics-guided Infrared Spatiotemporal Noise Modeling Based on Hybrid Neural Representation," ***IEEE Sensors Journal***. [Under review].
- Chao Qu, *et al.* "Self-BSR: Self-supervised Image Denoising and Destriping Based on Blind-spot Regularization," ***IEEE Transactions on Circuits and Systems for Video Technology***. [Minor revision].
- Chao Qu, *et al.* "XXXXXX," ***CVPR2025***. [Submitted].

Projects

National Natural Science Foundation of China - 62101256 (Participant) 2021 – 2024

- To improve the imaging performance of low-cost infrared detectors, degradation modeling involving blur and noise based on unpaired data is explored to achieve image denoising and super-resolution.
- Deployment of deep models on edge computing platforms, such as NVIDIA Jetson and HUAWEI HiSilicon.

Jiangsu Provincial Key Research and Development Program - BE2022391 (Participant) 2022-2024

- A self-supervised image denoising and destriping method is proposed, integrating the advantages of learning-based and model-based approaches to achieve robust reconstruction performance in the real world.

Awards

The National 2nd Prize, China Graduate Electronic Design Contest 2022

- Construction of infrared and visible light coaxial imaging system, and development of all-weather driving assistance based on multi-mode fusion algorithm.

Skills

- **Experimental Techniques**: Optical system construction, Camera development
- **Programming Languages**: C++, Python, MATLAB
- **Frameworks and Libraries**: PyTorch, Gstreamer

Others

- **Reviewer**: IEEE Trans. Circuits Syst. Video Technol., Infrared Physics & Technology