

Yuanshen Guan

I am a Ph.D. candidate in Electronic Engineering at the University of Science and Technology of China (USTC), supervised by Prof. Zhiwei Xiong in the VIDAR (Visual Information Discovery And Recovery) lab.

My research broadly lies at the intersection of generative models and low-level vision. Particularly, I am interested in Diffusion Models, Diffusion Distillation, HDR imaging, multi-modal image fusion, and image restoration.

[Email](#) / [Github](#) / [Google Scholar](#)



Education

University of Science and Technology of China (USTC), Anhui, China

Ph.D. Candidate in Electronic Engineering

Advisor: Prof. Zhiwei Xiong

2022 – Present

Northeastern University (NEU), Liaoning, China

B.S. in Automation and Electronic Engineering

2018 – 2022

Publications

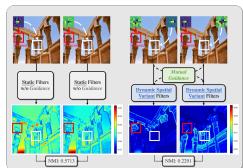


HDR Image Generation via Gain Map Decomposed Diffusion

Y. Guan, R. Xu, Y. Liao, M. Yao, L. Wang, Z. Xiong

International Conference on Computer Vision (ICCV), 2025 (Under-review)

We introduce a novel, decoupled method for generating high-dynamic-range (HDR) images by leveraging Gain Maps. Our approach uses an unsupervised pipeline to create a large-scale dataset, enabling the generation of HDR content (up to 10,000 nits, BT.2020 color gamut) and facilitating the conversion of SDRTV to HDRTV.

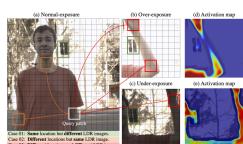


Mutual-Guided Dynamic Network for Image Fusion

Y. Guan, R. Xu, M. Yao, L. Wang, Z. Xiong.

Proceedings of the 31st ACM International Conference on Multimedia (ACM-MM), 2023

This paper integrates dynamic networks into the field of image fusion. We propose a mutual-guided dynamic filter and gradient mutual information loss to establish a more general image fusion paradigm, achieving SOTA performance.

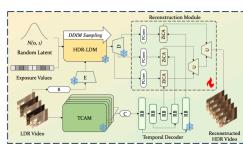


EdiT: Edge-guided Transformer for Ghost-free High Dynamic Range Imaging

Y. Guan, R. Xu, M. Yao, J. Huang, Z. Xiong.

ACM Transactions on Multimedia Computing, Communications, and Applications (ACM-TOMM)

This paper aims to reduce ghosting artifacts in HDR imaging. The proposed network incorporates exposure-insensitive gradient information into the transformer architecture for a more resilient self-attention mechanism.



HDR-Diffusion: HDR Video Reconstruction via Temporal-Consistent Conditional Diffusion Models

Y. Guan, R. Xu, M. Yao, R. Gao, L. Wang, Z. Xiong.

European Conference on Computer Vision (ECCV) Workshop, 2024

This paper explores using diffusion models for HDR video reconstruction, combining regression and generation paradigms to leverage the generative representation as a complementary component to a reconstruction network.

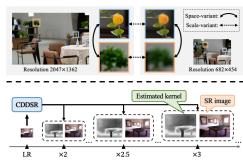


Learning Gain Map for Inverse Tone Mapping

Y. Liao, Y. Guan, R. Xu, J. Li, S. Sun, Z. Xiong.

The Thirteenth International Conference on Learning Representations (ICLR), 2025

We introduce the Gain Map-based Inverse Tone Mapping (GM-ITM) task and propose a dual-branch GMNet. We also built synthetic and real-world SDR-GM datasets to support this research direction.

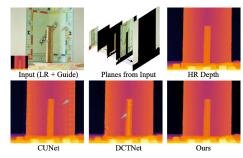


Learning Continuous Degradation for Arbitrary-Scale Blind Super-Resolution

J. Xia, Y. Guan, R. Xu, J. Li, M. Yao, Z. Xiong.

International Conference on Computer Vision (ICCV), 2025 (Under-review)

We propose Continuous Degradation-Driven Super-Resolution (CDDSR), an alternating framework that learns continuous representations for degradation estimation and image restoration to handle complex, continuous degradations for arbitrary-scale SR.

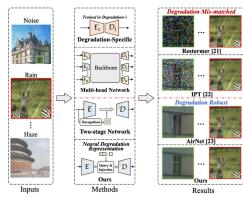


Learning Piece-wise Planar Representation for Guided Depth Super-Resolution

R. Xu, M. Yao, Y. Guan, Z. Xiong.

IEEE Transactions on Computational Imaging (TCI)

This paper addresses guided depth super-resolution by using a piecewise planar representation to leverage high-resolution RGB images without over-transferring texture. The proposed network uses these planes to bridge the two modalities, fuses information to remove inconsistencies, and employs a self-training strategy for real-world deployment.



Neural Degradation Representation Learning for All-In-One Image Restoration

M. Yao, R. Xu, Y. Guan, J. Huang, Z. Xiong

IEEE Transactions on Image Processing (TIP)

All-in-one image restoration aims to alleviate discrepancies between the image restoration model and different types of degradation. This paper proposes capturing the underlying characteristics of various degradations through discrete neural degradation representations. This enables successful identification and resolution of unknown and real-world degradations.

Skills & Honors

Skills

Languages: IELTS (7.0), GRE (170Q, 155V)

Programming: Python, Matlab, C++

Platforms: Linux, MacOS, Windows

Development: Docker, Git, Pytorch, Tensorflow, Anaconda

Honors

National Scholarship (Master), 2024

National Scholarship (Bachelor), 2019

First Class & Other Scholarships, 2020-2023

UG2+ Competition (Atmospheric Turbulence Mitigation), 4th Prize, 2023

MIPI Competition (RGBW Joint Fusion and Denoise), 4th Prize, 2022

Mathematical Contest in Modeling (MCM), Honorable Mention, 2021

Template source code from [here](#).