XUHAN SHENG (盛栩涵)

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EDUCATION

Peking University, School of Electronic and Computer Engineering 2023 – Present

- Master's Degree | Computer Application Technology | GPA: 3.87/4.00 | Advisor: Jian Zhang

Dalian University of Technology, School of Artificial Intelligence 2019 – 2023

- Bachelor's Degree | Artificial Intelligence | GPA: 4.13/5.00 | Advisor: Xu Jia

INTERNSHIPS

OPPO Research Institute, Imaging Algorithm Engineer Intern May 2025 – Present

- AI Talent Program: Class of 2026 Dream-Seeking Internship
- Vision-Language Models for Assisting AI-based Image Enhancement.
- Advisor: Lei Zhang (IEEE Fellow, Chair Professor of Hong Kong Polytechnic University)

RESEARCH BACKGROUND

(1) **Diffusion-based Image Super-Resolution for Panoramic Images** (Previous Research): Panoramic images, pivotal in VR/AR applications, necessitate ultra-high resolution (e.g., 4K×8K), yet real-world degradation introduces ill-posed challenges to high-quality reconstruction. Diffusion models enable effective high-fidelity restoration by virtue of their robust image prior capabilities.
(2) **Vision-Language Models for Assisting AI-based Image Enhancement** (Current Focus): Perceptually salient artifacts in AI-generated images constitute a critical bottleneck. Current research is focused on training vision-language models to precisely localize artifact regions with interpretable annotations, thereby facilitating more accurate super-resolution and broader enhancement tasks.

PUBLICATIONS

- **First Author Paper: 1 ECCV (Oral, co-first author), 1 NeurIPS (under review).**
- **Other Contribution: 1 ICME (Oral), 1 CVPR Workshop (Champion solution).**

Below is the full list of publications (* denotes co-first author):

1. Runyi Li*, **Xuhan Sheng***, Weiqi Li, Jian Zhang, "*OmniSSR: Zero-shot Omnidirectional Image Super-Resolution using Stable Diffusion Model*", **ECCV 2024 (Oral, Acceptance Rate: 2.3%)** (Top-tier international conference in computer vision).
   - **Overview**: We propose OmniSSR, a novel zero-shot omnidirectional image super-resolution method based on Stable Diffusion priors. It is the first to apply diffusion models to this task, integrating Octahedral Tangent Plane Information Interaction (OTII) and Gradient Decomposition (GD) strategies. Without any training, OmniSSR significantly enhances the fidelity and realism of panoramic images, outperforming existing diffusion-based methods, achieving up to +6 dB in WS-PSNR and a 48% improvement in LPIPS, while striking a balance between fidelity and perceptual quality.
   - **Contributions**: Code implementation, iterative design of OmniSSR and its experiments.
2. **Xuhan Sheng***, Runyi Li*, Bin Chen, Weiqi Li, Xu Jiang, Jian Zhang, "*RealOSR: Latent Unfolding Boosts Diffusion-based Real-world Omnidirectional Image Super-Resolution*", **Under Review at NeurIPS 2025** (CCF-A, Top-tier international conference in computer vision).
   - **Overview**: RealOSR introduces a one-step diffusion-based super-resolution network guided by latent space unfolding. It incorporates lightweight domain alignment and degradation-aware modules to efficiently restore real-world panoramic images. While maintaining high visual quality, RealOSR achieves over 200× inference speedup compared to existing methods, significantly reduces VAE transformation overhead, and utilizes fewer parameters, making it suitable for practical panoramic image enhancement.
   - **Contributions**: Major contributor to codebase, experiments, and manuscript writing.

3. Guanhua Zhao*, Yu Gu*, **Xuhan Sheng**, Yujie Hu, Jian Zhang, "*Label-guided Facial Retouching Reversion*", **ICME 2025** (Oral) (Top-tier international conference in multimedia).
   - **Overview**: We propose a facial retouching reversion algorithm capable of removing effects such as skin smoothing, eye enlargement, and face slimming.
   - **Contributions**: Developed a hierarchical adaptive instance normalization module that aligns local-to-global image color distributions, effectively mitigating color drift in the diffusion process. Achieved over 20 improvement in FID and a 1.4dB increase in PSNR.
4. Xiaopeng Sun*, Weiqi Li*, Zhenyu Zhang, Qiufang Ma, **Xuhan Sheng**, et al., "*OPDN: Omnidirectional Position-Aware Deformable Network for Omnidirectional Image Super-Resolution*", **CVPRW 2023**.
   - **Overview**: Champion solution of the NTIRE 2023 Challenge on 360° Panoramic Image Super-Resolution.
   - **Contributions**: Proposing a spatial-frequency image information fusion module that better leverages both global and local features to enhance super-resolution performance. Also responsible for fisheye camera data collection to support model training.

Practical Skills

- Programming: Python (with PyTorch)
- English: CET-4 (scores: 587), CET-6 (scores: 467).

Honors and Awards

- Peking University **Academic Excellence Award** 2024
- Dalian University of Technology **University-level Outstanding Graduate** 2023
- Dalian University of Technology First-class Academic Excellence Scholarship 2022
- Dalian University of Technology Second-class Academic Excellence Scholarship 2021
- Dalian University of Technology First-class Academic Excellence Scholarship 2020