Xuhai **Chen**

Shandong Province, China

✉ Email | 🏠 Homepage | 🐙 Github | 🎓 Google Scholar

"Our greatest glory is not in never falling, but in rising every time we fall."

Education

Zhejiang University   *Hangzhou, China*

M.S. IN CONTROL SCIENCE AND ENGINEERING   *Sep. 2022 - PRESENT*

- 2022-2023 **National Scholarship**
- 2022-2023 Outstanding Student Honor

TongJi University   *Shanghai, China*

B.S. IN ELECTRONIC AND INFORMATION ENGINEERING   *Sep. 2018 - Jun. 2022*

- 2022 **Outstanding Graduate**
- 2019-2020 Outstanding Student Honor

Selected Publications

Better "CMOS" Produces Clearer Images: Learning Space-Variant Blur Estimation for Blind Image Super-Resolution   *CVPR 2023*

XUHAI CHEN, JIANGNING ZHANG, CHAO XU, YABIAO WANG, CHENGJIE WANG, YONG LIU   *Oct. 2021 - Nov. 2022*

- To extend the traditional focus on space-invariant degradation to space-variant, we introduce a new degradation model for out-of-focus and create two corresponding datasets to support further research.
- We propose a model named CMOS for estimating space-variant blur. The key insight is that the boundaries of space-variant blur often align with semantic edges, thus semantic information can be leveraged to improve the accuracy of blur prediction.
- CMOS can estimate both space-variant and space-invariant blur, and when combined with existing non-blind super-resolution models, it can achieve SOTA blind super-resolution performance in both cases.

A Zero-/Few-Shot Anomaly Classification and Segmentation Method for CVPR 2023 VAND Workshop Challenge (Technical Report of the Challenge)   *CVPRW Challenge 2023*

XUHAI CHEN, YUE HAN, JIANGNING ZHANG   *Jan. 2023 - Jun. 2023*

- We leverage the zero-shot capabilities and generalizability of the large vision-language model CLIP.
- For zero-shot, to address the misalignment between image and text features during anomaly segmentation, we propose to add a fine-tuned linear layer to map the image features to the desired joint embedding space. We are the first to demonstrate that fine-tuning CLIP on unrelated categories can significantly boost the zero-shot anomaly detection performance.
- For few-shot, we use multi-level memory banks to fully harness the features of the reference images.

Experiences

APRIL Lab, Zhejiang University   *Advisor: Prof. Yong Liu*

3D ASSET GENERATION (ONGOING AND FUTURE)   *Aug. 2023 - PRESENT*

- Common practice, SDS, omits the U-Net Jacobian term without explanation. Improvements consistently avoid discussing this issue and can all be summarized within a unified framework aimed at counteracting the inherent bias of diffusion models. Researching the essence of SDS.
- Researching the relationship between the U-Net Jacobian term and the diversity of the generated 3D assets.

4D ASSET GENERATION (ONGOING AND FUTURE)   *Aug. 2023 - PRESENT*

- Large motions compromise structure, whereas preserving structure restricts motion magnitude. Researching disentangled approaches.
- Researching the combination of 3D Gaussian Splatting with Hexplane.

ANOMALY DETECTION   *Nov. 2022 - Aug. 2023*

- Conducted research on anomaly classification and segmentation under challenging settings: multi-class, few-shot, and zero-shot.

IMAGE SUPER-RESOLUTION   *Oct. 2021 - Nov. 2022*

- Conducted research on advanced degradation models in blind image super-resolution, focusing on space-variant blur.

Competitions

INTERNATIONAL

2023	**1st Place**, CVPR Workshop 2023 Visual Anomaly and Novelty Detection Challenge Zero-Shot Track		*Vancouver Canada*
2023	**4th Place**, CVPR Workshop 2023 Visual Anomaly and Novelty Detection Challenge Few-Shot Track		*Vancouver Canada*