

HAOKUN ZHU

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EDUCATION

- **Shanghai Jiao Tong University** Shanghai, China
• *B.Eng in Computer Science and Technology; GPA: 89.41/100; 3.84/4.3* Sep. 2020 – Jun. 2024

PUBLICATIONS (* MEANS EQUAL CONTRIBUTION, # MEANS CORRESPONDING AUTHOR)

- **AesStyler: Aesthetic Guided Universal Style Transfer**
• Ran Yi^{*,#}, [Haokun Zhu](#)^{*}, Teng Hu, Yu-Kun Lai, Paul L. Rosin
ACM MM 2024. [Website]
- **SAMVG: A Multi-stage Image Vectorization Model with the Segment-Anything Model**
• [Haokun Zhu](#)^{*}, Juang Ian Chong^{*}, Teng Hu, Ran Yi[#], Yu-Kun Lai, Paul L. Rosin
ICASSP 2024. [ArXiv:2311.05276]
- **M3DM-NR: RGB-3D Noisy-Resistant Industrial Anomaly Detection via Multimodal Denoise**
• Chengjie Wang, [Haokun Zhu](#), Jinlong Peng, Yue Wang, Ran Yi, Yunsheng Wu, Lizhuang Ma, Jiangning Zhang
Under Review (TPAMI) [ArXiv:2406.02263]
- **Stroke-based Neural Painting and Stylization with Dynamically Predicted Painting Region**
• Teng Hu, Ran Yi[#], [Haokun Zhu](#), Liang Liu, Jinlong Peng, Yabiao Wang, Chengjie Wang, Lizhuang Ma
ACM MM 2023. [Code] [ArXiv:2309.03504]
- **Phasic Content Fusing Diffusion Model with Directional Distribution Consistency for Few-Shot Model Adaption**
• Teng Hu, Jiangning Zhang, Liang Liu, Ran Yi[#], Siqi Kou, [Haokun Zhu](#), Xu Chen, Yabiao Wang, Chengjie Wang
Lizhuang Ma
ICCV 2023. [Code] [ArXiv:2309.03729]

EXPERIENCE & INTERNSHIP

- **Digital Media Computer Vision Laboratory(DMCV) in SJTU** Shanghai, China
• *Undergraduate Research Assistant advised by Prof Ran Yi* Oct. 2022 – Jun. 2024
 - **Few-shot Image Generation with Diffusion Model:** how to employ diffusion model in producing high-quality and diverse images in a new domain with only a small number of training data.
 - **Aesthetic Guided Universal Style Transfer:** how to transfer the style of an arbitrary image to another content image while striking a balance among aesthetic qualities, style transformation and content preservation.
 - **Stroke-based Neural Painting:** how to recreate a pixel-based image with a set of brushstrokes like real human-beings while achieving both faithful reconstruction and stroke style at the same time.
 - **Image Vectorization:** how to transform raster images into scalable vector graphics which have superior adaptability.
- **Youtu Lab at Tencent Technology (Shanghai) Co.Ltd** Shanghai, China
• *Research Intern advised by Jinlong Peng* Dec. 2023 – Jun. 2024
 - **Multimodal Industrial Anomaly Detection:** how to address the issue of ineffective feature integration in 3D point cloud and RGB images and apply multimodality to enhance industrial anomaly detection.

TECHNICAL SKILLS

- **Languages** Python, C/C++, Matlab, LaTeX, Mandarin(native), English(fluent, TOEFL: 111)
- **Tools** PyTorch, TensorFlow, OpenCV, OpenGL, LaTeX, Markdown, git

HONORS AND AWARDS

- **Principal's Award** Shanghai, China
• *Affiliation: Shanghai Jiao Tong University* Nov. 2022 - Nov. 2023
- **Merit Scholarship** Shanghai, China
• *Affiliation: Shanghai Jiao Tong University* 2021 & 2022

RESEARCH PROJECTS

- **AesStyler: Aesthetic Guided Universal Style Transfer (CV)** Jun. 2023 - Dec. 2023
Advisor: Ran Yi, Yu-Kun Lai, Paul L. Rosin
• We propose AesStyler, a novel Aesthetic Guided Universal Style Transfer method, utilizing pre-trained aesthetic assessment model, a novel Universal Aesthetic Codebook and a novel Universal and Specific Aesthetic-Guided Attention module. Extensive experiments and user-studies have demonstrated that our approach generates aesthetically more harmonious and pleasing results than the state-of-the-art methods. In this project,
 - I proposed to introduce the aesthetic assessment model, trained on a dataset with human-assessed aesthetic scores, into the universal style transfer task to accurately capture aesthetic features.
 - I proposed to build a Universal Aesthetic Codebook (UAC) to harness universal aesthetic features.
 - I proposed the novel Universal and Style-specific Aesthetic-Guided Attention (USAesA) module to guide the style transfer process, empowering our model to integrate the aesthetic attributes of both universal and style-specific aesthetic features with style features.

- I completed the initial drafting of the research paper by myself, meticulously explaining the methodology, crafting figures to illustrate the pipelines and analyzing the experimental results in detail.
- I single-handedly designed and conducted all the experiments, both qualitative and quantitative and 2 user-studies, demonstrating the superiority of AesStyler over current state-of-the-art methods.
- This work is accepted by ACM MM 2024.

SAMVG: An Image Vectorization Model with SAM (CV, CG)

Aug. 2023 - Dec. 2023

Advisor: Ran Yi, Yu-Kun Lai, Paul L. Rosin

- We propose SAMVG, a multi-stage model to vectorize raster images into Scalable Vector Graphics. Extensive experiments demonstrate that SAMVG can produce high quality SVGs in any domain with less computation time and complexity compared to previous SOTA methods. In this project,
 - I collaborated with the co-author to propose three innovative aspects.
 - I finished the final drafting of the paper, elaborating in detail on the methodology and conducted a thorough analysis of the experimental results in the paper.
 - This work is accepted by ICASSP 2024.

M3DM-NR: RGB-3D Noisy Industrial Anomaly Detection (CV)

Dec. 2023 - Jun. 2024

Advisor: Jimlong Peng

- We propose M3DM-NR, a novel noise-resistant framework to leverage the strong multi-modal(image and point cloud) discriminative capabilities of CLIP. Extensive experiments show that M3DM-NR outperforms state-of-the-art methods in 3D-RGB multi-modal noisy anomaly detection. In this project,
 - I proposed the 3-stage noise-resistant framework for noisy industrial anomaly detection.
 - I single-handedly designed and conducted all the experiments, both qualitative and quantitative, demonstrating the superiority of M3DM-NR over current state-of-the-art methods.
 - I completed the initial drafting of the research paper by myself, meticulously explaining the methodology, crafting figures to illustrate the pipelines and analyzing the experimental results in detail.
 - This work is submitted to TPAMI.

Stroke-based Neural Painting with Dynamical Region (CV)

Oct. 2022 - Mar. 2023

Advisor: Ran Yi

- We propose Compositional Neural Painter, a novel stroke-based rendering framework which dynamically predicts the next painting region based on the current canvas, instead of dividing the image plane uniformly. In this project,
 - I conducted most of the baseline comparison experiments, which demonstrates that our model outperforms the existing models in stroke-based neural painting.
 - This work is accepted by ACM MM 2023.

Few-Shot Diffusion Model Adaption (CV)

Feb. 2023 - Mar. 2023

Advisor: Ran Yi

- We propose a novel phasic content fusing few-shot diffusion model with directional distribution consistency loss, which targets different learning objectives at distinct training stages. In this project,
 - I contributed to the paper's composition and created several illustrative figures to elucidate our methodologies within the paper.
 - I conducted the majority of the baseline comparison experiments, demonstrating the superiority of our approach in few-shot generative model adaption tasks.
 - This work is accepted by ICCV 2023.

COURSE PROJECTS

Image-to-Image Translation: From Line to Sketch (CV)

May. 2023

- This is the CS3511 course project. We use two frameworks, pix2pix and pixel2style2pixel(pSp), to solve an image-to-image translation task: line generation sketch task. We achieved great results in the workshop of CGI-PSG2023 with this project, ranking 3rd in FID and 2nd in SSIM. In this project,
 - I completed the pSp part of the project report by myself, explaining the methodology, crafting figures to illustrate the pipelines and analysing the experimental results in detail.
 - I completed the coding aspect of pSp in this project and conducted all qualitative and quantitative experiments of pSp in the report, demonstrating the superiority of pSp in line generation sketch task.

Real-time Ray Tracing with OpenGL (CG)

Dec. 2022

- This is the CS3310 Computer Graphics course project, focusing on implementing real-time ray tracing in OpenGL to produce visual effects such as shadows, reflections, and refractions. It integrates the SMAA algorithm for anti-aliasing and enhances ray tracing efficiency through techniques like the Bounding Volume Hierarchy. In this project,
 - I completed the project report, explaining the methodology, crafting figures to illustrate the pipelines and conducting an in-depth analysis of the experimental results.
 - I accomplished the majority of the work on our OpenGL pipeline and successfully implemented the BVH acceleration algorithm, achieving real-time ray tracing.