Haokun Zhu

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Education

- **Shanghai Jiao Tong University** — Shanghai, China
  Bachelor of Science in Computer Science; **GPA:3.84/4.3; 89.41/100** — *Sep. 2020 – Jun. 2024*

Relevant Coursework

- Linear Algebra(A+)
- Probability Statistics(A+)
- C++ Programming(A+)
- Data Structures
- Algorithm & Complexity
- Computer Architecture
- Operating Systems
- Computer Graphics(A+)
- Computer Network(A+)
- Artificial Intelligence(A+)
- Machine Learning(A)
- Data Science Intro.(A)

Publications

- **Haokun Zhu**, Ran Yi, Teng Hu, Yu-Kun Lai, Paul L. Rosin, *AesStyler: Aesthetic Guided Universal Style Transfer*, **Under Review(CVPR 2024**), https://zwandering.github.io/
- **Haokun Zhu***, Juang Ian Chong*, Teng Hu, Ran Yi, Yu-Kun Lai, Paul L. Rosin, *SAMVG: A Multi-stage Image Vectorization Model with the Segment-Anything Model*, **Under Review(ICASSP 2024**), https://arxiv.org/abs/2311.05276
- Teng Hu, Ran Yi, **Haokun Zhu**, Liang Liu, Jinlong Peng, Yabiao Wang, Chengjie Wang Lizhuang Ma, *Stroke-based Neural Painting and Stylization with Dynamically Predicted Painting Region*, **ACM MM 2023**, https://arxiv.org/abs/2309.03504/
- Teng Hu, Jiangning Zhang, Liang Liu, Ran Yi, Siqi Kou, **Haokun Zhu**, Xu Chen, Yabiao Wang, Chengjie Wang Lizhuang Ma, *Phasic Content Fusing Diffusion Model with Directional Distribution Consistency for Few-Shot Model Adaption*, **ICCV 2023**, https://arxiv.org/abs/2309.03729/

Research Experience

- **Digital Media Computer Vision Laboratory(DMCV) in SJTU** — Shanghai, China
  Undergraduate research assistant advised by Prof Ran Yi — *Oct. 2022 – Now*
  - **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 transfromation and content presevation.
  - **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 and detailed representation.

Technical Skills

- **Languages** Python, C/C++, Matlab, LaTex, Mandarin(native), English(fluent)
- **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*

Projects

- **AesStyler: Aesthetic Guided Universal Style Transfer(CV)** — Nov. 2023
  I propose AesStyler, a novel Aesthetic Guided Universal Style Transfer method, utilizing pre-trained aesthetiic assessment model, a novel Universal Aesthetic Codebook and a novel Universal and Specific Aesthetic-Guided Attention module. In this project,
  - **I proposed three novel contributions and implemented them independently, which empowers AesStyler to produce results that are aesthetically more harmonious and pleasing compared to current SOTA methods.**
  - **I completed the initial drafting of the research paper by myself, meticulously explaining the methodology, crafting figures to illustrate the pipelines and analysing 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 SOTA methods.**
- **SAMVG: A Multi-stage Image Vectorization Model with SAM(CV, CG)** — Sep. 2023
  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.**

- **Stroke-based Neural Painting with Dynamically Predicted Painting Region(CV)** Nov. 2022
  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 into painting regions. 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.**

- **Few-Shot Diffusion Model Adaption with Directional Distribution Consistency(CV)** Mar. 2023
  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, demonstrate the superiority of our approach in few-shot generative model adaption tasks.**

- **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 course project, which implements real-time ray tracing and create visual effects like shadows, reflections, and refractions using OpenGL. It incorporates the SMAA algorithm for efficient anti-aliasing and boosts ray tracing performance with algorithms such as Bounding Volume Hierarchy (BVH), 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.**