Xin Xie

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EDUCATION

Dalian University of Technology - *School of Information and Communication Engineering*　　*Sep.2021 - Jun.2024*
- *Master of Engineering* in Information and Communication Engineering (Artificial Intelligence)
- Mentor: Associate Prof. Yi Li
- GPA: 3.83 / 4.0　　Average Score : 91.25 / 100
- Reseach Topics: Disentangled Representations, Style Transfer, Image Generation

Dalian Maritime University - *College of Marine Electrical Engineering*　　*Aug.2017 - Jun.2021*
- *Bachelor of Engineering* in Automation
- GPA: 4.01 / 5.0　　Average Score : 90.00 / 100　　Rank: 7 / 123
- Main courses: Signals and Systems, Automatic Control Theory, Basics of Computer Software
- Reseach Topics: Object Detection, Image-to-image Translation

RESEARCH EXPERIENCE

Research Assistant, Dalian University of Technology　　*Sep.2021 - Jun.2024*
- Work in Artificial Intelligence and Security Lab, Faculty of Electronic Information and Electrical Engineering.
- Developed a novel approach to analyze and process data while ensuring privacy protection, which helps to train models effectively without compromising sensitive user information. In addition, designed a framework to reduce computational burden in artistic style transfer, enabling faster and more efficient processing and generating more high-quality and compelling artworks. Furthermore, exploring the latent space to achieve the image editing and continuous image generation.

Research Intern, ByteDance　　*Jun.2022 - Feb.2023*
- Worked in Product RD and Infrastructure department, AI lab.
- Cooperated with the counterparts in North America and Singapore, the interesting special vision effects for users is achieved and published on TikTok, such as rendering picture in Van Gogh style, transferring the natural scene into an oasis or a snowy landscape. Besides, deep exploration of diffusion model verified the sufficient effectiveness of generating more realistic images with fine-grained control over their structure and style, being useful to produce a new dataset. My programming ability has been imporved a lot by developing such challenging projects.

Research Intern, Chinese Academy of Sciences (CASIA)　　*Jul.2021 - Sep.2021*
- Worked in National Laboratory of Pattern Recognition (NLPR), Institute of Automation.
- Diving into the style transfer, there is rich latent information in the high-dimensional feature space, which is worth further in-depth research. Based on disentanglement technology, style components are seperated from the style features, which control different artistic style effect, such as line, texture, shape, etc. Then artistic style editing is achieved by modifying the style features according to these style components. Extensive experiments demonstrate the interpretability of style components. During my internship at the research center, I officially began my academic journey, learning how to research with related reference works, summarize, apply and innovation.

PUBLICATIONS

Artistic Style Discovery with Independent Components　　*CVPR (CCF-A), Jun.2022*

Xin Xie, Yi Li, Huaibo Huang, Haiyan Fu, Wanwan Wang, Yanqing Guo
- We introduce a novel unsupervised algorithm that can discover various styles from the latent space, advancing the ability of controllable stylization.
- We obtain the independent style components from the mixed latent style dimensions in style transfer, resulting in multiple artistic stylizations and lowering computational costs.
- Our method is generally applicable without training and we demonstrate the effectiveness and flexibility of our approach via abundant experiments on several state-of-the-art style transfer models.

A Compact Transformer for Adaptive Style Transfer   *ICME (CCF-B), Jul.2023*

*Yi Li, **Xin Xie**, Haiyan Fu, Xiangyang Luo, Yanqing Guo*

- To alleviate the computation burden, we design a compact transformer with shared and detached architectures to achieve artistic style transfer, reducing the model scale by about 20% compared to StyTr^2.
- To address the inherent style leak in the transformer, we integrate AdaIN with the decoder layer, further encouraging the attention to select the style element adaptively by the content.
- Extensive experimental results on generation, efficiency and ablation verify that our framework is capable of generating high-quality stylization with less computation cost.

Federating Hashing Networks Adaptively for Privacy-Preserving Retrieval   *ICME (CCF-B), Jul.2023*

*Yi Li, Meihua Yu, **Xin Xie**, Haiyan Fu, Hao He, Yanqing Guo*

- Different from those that most focus on classification, we tailor a novel federated learning paradigm FedA-Hash for hashing networks and benefit the retrieval model training process under the privacy-preserving constraint.
- To address the non-IID issue, we propose a simple but effective solution that blends the bilateral knowledge between the global model and the local model by adopting the KL-divergence loss, making each client obtain the personalized model fit for its data.
- FedA-Hash is a collaborative paradigm with universality. Abundant experiments are conducted on various backbones as well as in different settings. The results demonstrate the superiority of FedA-Hash in tasks including general image retrieval and person re-identification.

RoNet: Rotation-oriented Continuous Image Translation   *TNNLS (CCF-A), Under Review*

*Yi Li, **Xin Xie**, Lina Lei, Haiyan Fu, Yanqing Guo, Ming Yao*   (Equally contributing with the first author)

- To achieve continuous Image-to-Image (I2I) translation, we propose a novel rotation-oriented mechanism which embeds the style representation into a plane and utilizes the rotated representation to guide the generation. RoNet is accordingly implemented to learn the rotation plane automatically while disentangling the content and the style of an image simultaneously.
- To produce realistic visual effects on challenging textures like trees in forests, we design a patch-based semantic style loss. It first matches the patches from different domains and then learns the style difference with high pertinency.
- Experiments on various translation scenarios are conducted, including season shifting in forests, $real\ face \rightarrow comic\ portrait$, solar day shifting of streetscapes and $iphone \rightarrow dslr$. With the guidance of the rotation, RoNet successfully generates realistic as well as continuous translation results with a single input image.

RESEARCH PROJECTS

- **Federated hashing methods for data privacy protection**, supervised by Haiyan Fu   *Jan.2021 - Dec.2024*
- **Collaborative compute via joint mapping across multiple parties**, supervised by Yanqing Guo   *Jan.2020 - Dec.2022*
- **Deep learning-based image disentanglement methods**, supervised by Yi Li   *Jan.2021 - Dec.2022*
- **Image semantic disentanglement for multi-party multi-task collaboration**, supervised by Yi Li   *Jan.2022 - Dec.2024*

SELECTED HONORS

Excellent Student Scholarship, Dalian University of Technology   *Oct.2022*
First-class Scholarship, Dalian University of Technology   *Oct.2022*
Outstanding Postgraduate Student, Dalian University of technology   *Oct.2022*
Second-class Scholarship, Dalian University of Technology   *Oct.2021*
Outstanding Graduate, Dalian Maritime University   *Jun.2021*

SKILLS

Programming: Python, PyTorch, LaTeX
Languages: English (conversant), Mandarin (native)
IELTS Score: Listening - 6.0, Reading - 8.0, Writing - 6.5, Speaking - 6.0, Overall Band Score - 6.5

ACADEMIC SERVICES

Reviewer: CVPR 2022 (*CCF-A*), **NeurIPS 2022** (*CCF-A*), **IJCAI 2022** (*CCF-A*), **MICCAI 2022** (*CCF-B*), **NeurIPS 2023** (*CCF-A*), **CVPR 2023** (*CCF-A*), **ICCV 2023** (*CCF-A*)