KAIDONG ZHANG

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PERSONAL PROFILE

Kaidong Zhang is a 4th-year Ph.D candidate at University of Science and Technology of China (USTC). He is under the supervision of Dong Liu, and work closely with Jingjing Fu at MSRA.

His research interests include low-level vision, medical image processing and NeRF-based 3D rendering. He concentrated on video super-resolution and enhancement in the early period, and won the 2nd place in AI+4K HDR track of the first National Artificial Intelligence Competition (NAIC). Later, he transferred his research interest to video inpainting and editing, and published several papers on top conferences in computer vision. Now, he focuses more on the modeling of 3D reality in computer vision and the medical image processing for ground-breaking applications.

EDUCATION

University of science and technology of China-Hefei,China   Sep 2019 - present

Major: Electronics and Information Engineering
Supervisor: Dong Liu

Xi'an Jiaotong University-Xi'an, China   Sep 2015 - Jun 2019

Major: Electronics and Information Engineering
Grades:Rank 8/160, GPA:3.7

PUBLICATIONS

K. Zhang, D Liu. Customized Segment Anything Model for Medical Image Segmentation. In Arxiv 2023.

K. Zhang, J Peng, J. Fu, D. Liu. Exploiting Optical Flow Guidance for Transformer-Based Video Inpainting. In Arxiv 2023.

K. Zhang, J. Fu, D. Liu. Flow-Guided Transformer for Video Inpainting. In ECCV 2022.

K. Zhang, J. Fu, D. Liu. Inertia-Guided Flow Completion and Style Fusion for Video Inpainting. In CVPR 2022.

MAJOR AWARDS

MSRA Star of Tomorrow Excellent Internship Award
2nd place (runner up) in AI+4K HDR track of the first National Artificial Intelligence Competition (CNY 500K)

PROJECT/RESEARCH EXPERIENCE

Medical image segmentation   Apr 2022-Present

- Customize Segment Anything Model (SAM) on Synapse data for multi-organ semantic segmentation. Propose a series of training strategies to improve performance while maintaining low deployment and storage overhead.
- Construct a large-scale dataset for bone segmentation and the segmentation between ancetabular and femoral head and propose a pipeline to generate the labels automatically. Moreover, I also validate the efficacy of this dataset on several medical image segmentation tasks.

Video inpainting   Sep 2020-Jan 2023

- Improve optical flow completion quality with explicit motion prior (inertia) and learnable motion association (3D network)
- First propose the style incoherence after flow-guided content propagation across frames, and design style fusion strategy to reduce such artifacts.
- Investigate the transformer behavior with flow information guidance, and design elaborated window-partition and spatial-temporal decoupled strategy for efficiency-performance balance.

AI+4K HDR channel of the first National Artificial Intelligence Competition   Oct 2019-Jan 2020

- Design the algorithm for sequential super-resolution and HDR transform process.
- Organize the dataset and accelerate the training process
- Do the ablation studies to verify ideas such as the impact of black edges, the comparison between single image enhancement and multi images enhancement for a video enhancement problem.

Real-Time video action recognition   Jan 2019-Jun 2019

- The backbone is TSN(Temporal Segment Network), which is a dual-stream action recognition system. We replace optical flows with motion vectors to accelerate recognition process, the FPS is raised from 14 to 230.
- We adopt knowledge distillation method to transfer the knowledge from the optical flow network (teacher) to the motion vector network (student) for acceleration while maintaining competitive performance.

WORK EXPERIENCE

Research intern-Microsoft Research Asia   Aug 2020-Jan 2022

Teaching Assistant-Data Structure and algorithm Course   Sep 2019-Dec 2019