

Zhexiao Xiong

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EDUCATION

Washington University in St.Louis

Ph.D. in Computer Science Advisor: Prof.Nathan Jacobs

St.Louis, MO, USA

Aug. 2022 – May 2027(expected)

Tianjin University

B.Eng. in Electrical and Information Engineering

Tianjin, China

Sep. 2018 – June 2022

RESEARCH EXPERIENCE

Graduate Research Assistant

Washington University in St.Louis

August. 2022 – Present

Advisor: Prof. Nathan Jacobs

- Research on image synthesis, diffusion models, especially on outdoor scenes.
- Research on stereo matching, depth estimation, optical flow estimation and domain adaptation.

Computer Vision Research Intern

OPPO Research Institute, Beijing, China

February. 2022 – May. 2022

Mentor: Dr.Bo Xu

- Researched on image matting, proposed a framework to use human pose as guidance to achieve whole body matting.

Undergraduate Research Assistant

Institute of Automation, Chinese Academy of Sciences, Beijing, China

Jan. 2021 – Jan. 2022

Advisor: Prof. Jinqiao Wang

- Researched on model compression and network pruning, especially the application on Vision Transformer.

PUBLICATIONS

Zhexiao Xiong, Feng Qiao, Yu Zhang, Nathan Jacobs. **StereoFlowGAN: Co-training for Stereo and Flow with Unsupervised Domain Adaptation**, British Machine Vision Conference (BMVC), 2023.

Nanfei Jiang, **Zhexiao Xiong**, Hui Tian, Xiaojie Du, Xu Zhao, Chaoyang Zhao*, Jinqiao Wang. **PruneFaceDet: Pruning Lightweight Face Detection Network by Sparsity Training**, Cognitive Computation and Systems, 2021.

Zhexiao Xiong, Xin Wen, Xu Zhao*, Haiyun Guo, Chaoyang Zhao, Jinqiao Wang. **Two-level Iteration Method for Multi-task Learning with Task-isolated Labels**, International Conference on Computer Vision and Pattern Analysis, 2021.

RESEARCH INTERESTS

I am broadly interested in computer vision and multi-modal learning, especially in autonomous driving and remote sensing scenes, including crossview & novel view synthesis, birds-eye-view perception, and fundamental computer vision problems such as stereo matching, optical flow estimation, depth estimation and domain adaptation.

RESEARCH PROJECTS

Near panorama synthesis based on Diffusion Model

Washington University in St.Louis

03/2023 – present

Advisor: Prof. Nathan Jacobs

- Utilize geospatial information to guide the diffusion model in near panoramas synthesis task.

Co-training for Stereo and Flow with Unsupervised Domain Adaptation

Washington University in St.Louis

01/2023 – 05/2023

Advisor: Prof. Nathan Jacobs

- Built an end-to-end joint learning framework to combine unsupervised domain translation with optical flow estimation and stereo matching in the absence of real ground truth optical flow and disparity,
- Applied novel constraints on the cycle domain translation process to achieve cross-domain translation with global and local consistency.
- Employed task-specific multi-scale feature warping loss and iterative feature warping loss during the training phase to regulate the training process in both spatial and temporal dimensions.

Vision Transformer pruning

Institute of Automation, Chinese Academy of Sciences

03/2022 – 08/2022

Advisor: Prof. Jinqiao Wang and Dr. Xu Zhao

- Based on L_0 regularization, we proposed a unified framework that jointly applied masks on MSA and MLP layers, which reduce the number of parameters of the model without breaking the original structure of the model.
- Transferred our proposed structured pruning framework to downstream tasks and get the state-of-the-art performance, which does not require consuming computation resources on training on upstream datasets.

Mobile AI 2021 Real-Time Camera Scene Detection Challenge | Mobile AI Workshop @ CVPR 2021

- Used two-stage fine-tuning method to improve the accuracy and the model pruning method to improve the model's efficiency.
- Used the float32-to-int8 quantization and model pruning methods to optimize our model.
- Submitted the final TFLite model which can be deployed on mobile platforms and achieved Fast Camera Scene Detection via light-weight network designing and model pruning.

TECHNICAL SKILLS

Programming: Python, C/C++, Java, Matlab

Deep Learning Frameworks: Pytorch, Tensorflow

Languages: English, Chinese