

# Zhexiao Xiong

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## EDUCATION

### Washington University in St. Louis

*Ph.D. in Computer Science*

St. Louis, MO, USA

Aug. 2022 – May 2027(*expected*)

### Tianjin University

*B.Eng. in Communication 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, Neural Radiance Field(NeRF), especially on large-scale outdoor scenes.
- Research on stereo matching, depth estimation, and domain adaptation.

### Computer Vision Research Intern

*OPPO Research Institute, Beijing, China*

February. 2022 – May. 2022

*Mentor: Dr. Bo Xu*

- Research on image matting, propose a framework to use human pose estimation 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*

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

## PUBLICATIONS

**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.

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.

## RESEARCH PROJECTS

### Photorealistic view synthesis of NeRF on outdoor scenes

*Washington University in St. Louis*

09/2022 – present

*Advisor: Prof. Nathan Jacobs*

- Based on photorealistic image synthesis method to synthesis the time-lapse images of a certain outdoor scene.
- Exploring methods that maintain cross-view consistency in outdoor NeRF synthesis.

### 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.

### Pruning Lightweight Face Detection Network by Sparsity Training

*Institute of Automation, Chinese Academy of Sciences*

02/2021 – 07/2021

*Advisor: Prof. Jinqiao Wang*

- Performed the network training with sparsity regularization on channel scaling factors of each layer, and then removed the connections and the corresponding weights with the near-zero scaling factors after the sparsity training.
- Applied the proposed pruning pipeline on a state-of-the-art face detection method, EagleEye, and got a shrunken model which has a reduced number of computing operations and parameters.
- Achieved 56.3% reduction of parameter size with almost no accuracy loss on WiderFace dataset.

### Two-level Iteration Method for Multi-task Learning with Task-isolated Labels

*Institute of Automation, Chinese Academy of Sciences*

05/2021 – 10/2021

*Advisor: Prof. Jinqiao Wang*

- Proposed a two-level iteration method based on multi-task learning, including the task-level inner iteration and regular outer iteration, which achieves training with task-isolated labels.
- Achieved training multi-task face attribute recognition networks without the need for full annotations of all images.

## PROJECTS

### 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