

Xiangtao Kong

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Education

- **University of Chinese Academy of Sciences (SIAT, CAS)**
• *M.Sc. in Computer science and technology.* Sept.2020 - Sept.2023
Supervised by **Prof. Chao Dong** and **Prof. Yu Qiao**.
- **Shandong University (SDU)**
• *Honors B.Eng. in Computer science and technology. GPA: 89.66 top 5%* Sept.2016 - Sept.2020
Courses: Image/Video Processing, Linear Algebra, Artificial Intelligence, Machine Learning, Software Development

Research Interest

- **Computer Vision, Image Processing, Image Restoration, Super-Resolution.**

Publications

- **Google Scholar** Citation : **154** (till April.2022)
- [1] **Xiangtao Kong***, Xina Liu*, Jinjin Gu, Yu Qiao, Chao Dong, "Reflash Dropout in Image Super-Resolution", accepted by **CVPR 2022**. [[PDF](#)]
- [2] **Xiangtao Kong**, Hengyuan Zhao, Yu Qiao, Chao Dong, "ClassSR: A General Framework to Accelerate Super-Resolution Networks by Data Characteristic", accepted by **CVPR 2021**. [[PDF](#), [Code](#)]
- [3] Hengyuan Zhao, **Xiangtao Kong**, Jingwen He, Yu Qiao, Chao Dong, "Efficient Image Super-Resolution Using Pixel Attention", accepted by **ECCV2020, AIM workshop**. [[PDF](#), [Code](#)]

Research Experience

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences Shenzhen, China

◆ Generalization Ability of Image Restoration Network (July 2021 - Present)

- ▶ Nowadays, more and more researchers pay attention to image restoration in real scenes instead of synthetic data. Therefore, the generalization ability of restoration networks becomes a more attractive topic.
- ▶ As a classic regression problem, SR exhibits a different behaviour as high-level tasks and is sensitive to the dropout operation. However, we find that appropriate usage of dropout benefits SR networks and improves the generalization ability in real scenes. This strategy is worth a tenfold increase in the model parameters. [1]
- ▶ Besides exploring strategies to improve generalization ability, we also prepare to propose a new dataset and benchmark to evaluate the generalization ability of restoration networks.

◆ Interpretability of SR Network (April 2021 - Present)

- ▶ Propose channel saliency map (CSM) to study different channels' contributions to the restoration result. Besides, we also apply deep degradation representation (DDR) to show that Dropout can prevent co-adapting in SR network and improve the generalization ability. [1]

◆ SR Network Acceleration and Efficient SR Network (October 2019 - November 2020)

- ▶ Propose ClassSR, a general framework to accelerate Super-Resolution networks by data characteristic. We use the networks with different complexity to process image patches with restoration difficulties. ClassSR can help most existing SR networks save up to 50% FLOPs. [2]
- ▶ Propose an efficient SR network called PAN which using a novel pixel attention to reduce the model parameters. It achieves the same performance of baseline model with only one-fifth parameters and is the model of minimum parameters in AIM2020 Workshop. [3]

INTERNSHIP

Sensetime, Video Super-Resolution

Beijing, China, March 2021 - July 2021

Based on the existing multi-frame image SR algorithm, we developed a real-time video SR framework. This framework is based on traditional image processing algorithm without neural network. It contains the steps of motion estimation, alignment, fusion, denoising and so on, each steps can be replaced or extended as needed.

Awards

- ▶ The First Prize in China Undergraduate Mathematical Contest in Modeling
- ▶ The Second Prize in Asian Student Supercomputer Challenge (ASC 2018 and 2019)
- ▶ Fourth place of ECCV AIM Efficient SR in 150 participants. (The lowest parameters)
- ▶ The scholarship in SDU and SIAT (four times)
- ▶ Titled the Superior Student of SDU and IACDE, SIAT

Skills Summary

- **Languages/Frameworks:** Python(PyTorch, Numpy, OpenCV), MATLAB, LaTeX, C++, Markdown, HTML