

# 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 : **166** (till May.2022)

- [1] **Xiangtao Kong\***, Xina Liu\*, Jinjin Gu, Yu Qiao, Chao Dong, "Reflash Dropout in Image Super-Resolution", accepted by **CVPR 2022**. [ [PDF](#), [Code](#) ]
- [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*)

- ▶ 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)
- ▶ The fourth place of ECCV AIM Efficient SR in 150 participants. (The lowest paramters)
- ▶ 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