Given low resolution images Use deep super-resolution algorithm To upscale it and improve details

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1 Motivation and Problem Definition

Improving the quality and details of an image has plenty of applications, ranging from satellite imaging to medical imaging.

The simplest approach to generating a high-resolution image by post-processing is through linear interpolation methods such as the nearest neighbor, bilinear, and bicubic interpolations.These methods are widely used for improving the resolution of a low-resolution image. However, conventional linear interpolation methods often produce over-smoothed images with artifacts such as aliasing, blur, and halo around the edges.

The super-resolution method is the process of estimating a high-resolution image from a low-resolution input image, which can reduce artifacts resulting from the conventional linear Interpolation methods. Recent super-resolution methods are example-based methods that learn the relationship between low-resolution and high-resolution image pairs.

This project aims to implement and test deep learning super-resolutions methods, as well as finding and defining the limits of such methods.

2 Methodology

We propose the following methodology :
- Bibliography about the subject and state-of-the-art methods.
- Choose the deep network architectures to implement (GANs, U-Net, ResNet, very Deep CNN, auto-encoder,...) and databases of different complexities.
- Test architectures and compare them with subpixel image processing methods and between them.

— Eventually see if it is possible to do the inverse process with allready implemented methods.

3 Evaluation

Trouver les datasets

Datasets possible :
— DIV2K
— Data from this github and paper

Références

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