NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Computer Science and Engineering
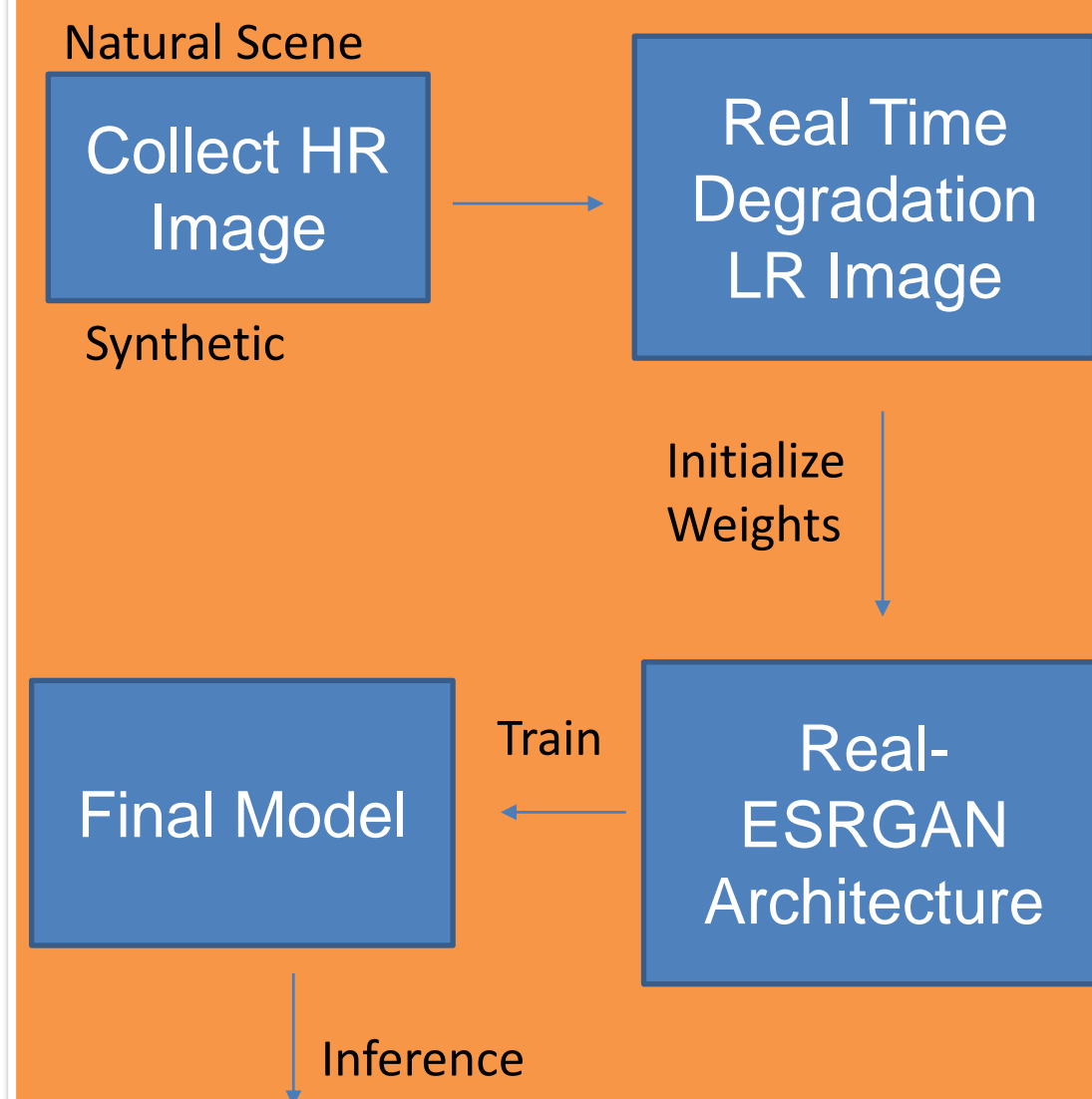College of Engineering

Text Restoration using Image Super Resolution

Student: Bodipati Kiran   Supervisor: Assoc Prof Chen Change Loy
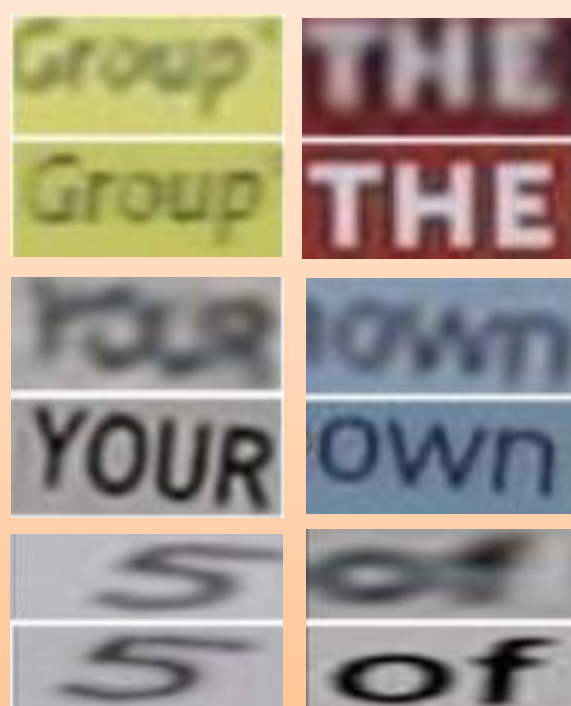
Project Overview

Text Recognition tends to perform poorly in natural scene data, especially when the image quality is of low resolution. To combat this, Super Resolution is proposed as a preprocessing step to improve the resolution of images. Traditional SR models are created for natural scenes and fail to perform accurately on text images due to the complex nature of text such as fonts, structures, orientations etc. The lack of high-quality datasets is also a challenge. To combat this, we propose a high-quality dataset of synthetic and real scene High Resolution (HR) images along with synthetically degraded Low Resolution (LR) images and train the images on the Real-ESRGAN Architecture, to show significant improvements in the SR task.

Training Procedure

Natural Scene

Collect HR Image → Real Time Degradation LR Image

Synthetic

Initialize Weights

Final Model ← Train ← Real-ESRGAN Architecture

Inference

Motivation for new Dataset

TextZoom Dataset is a popular dataset used for the SR task but has several limitations. The HR images in the dataset contains many degradations and are unsuitable for practical SR purposes. Hence, we build a new improved dataset with high quality Synthetic and Scene Text Images.

TextZoom Dataset

Image Degradation Processes

- Blur Degradation
- Gaussian/Poisson Noise
- Downsampling
- JPEG Loss
- Complex Degradation

Comparison of Results

Ground Truth
LR Input
Pretrained Model
New Model