Project ID: PW20VRB02

Project Type : Minor Project (Research)

Project Title: Generation of Deblurred and Super-resolved images using

GANs

Team Members: I Gautam Srinidhi 01FB16ECS140,

K P Arjun Rajesh 01FB16ECS148,

Krishna Siddharth S 01FB16ECS169

Project Guide: Prof. V R Badri Prasad

Project Abstract:

The goal of the Project we have worked on is to create and develop a machine learning pipeline which is comprised of two components firstly a Deblur Generative Adversarial Networks (GAN) and secondly a SuperResolution Generative Adversarial Networks (GAN) which work in unison in order to convert and transform Low Quality Blurred images into a higher quality Super resolved unblurred image. In our solution we are aiming to tackle various types of blurs such as linear blurring, Gaussian Blurring and,Media Blurring. The main Machine Learning Concept we are using in both components of our pipeline is GAN or Generative Adversarial Networks. GAN’s are unsupervised learning algorithms and generate data similar to the real data, using this principle we are generating Unblurred and super-resolved images. The Trained Discriminator acts as an Accurate classifier and has the main functionality of distinguishing and differentiating between the real images and the multiple generated images, At the point in time when the discriminator is unable to differentiate between the real images and the generated Unblurred images, it is safe to say that we have generated the most unblurred and Super resolved image as possible.

Create the following folders in deblur-gan/ folder   
1)input\_images

2) original

3) output\_all

4) output\_deblur

5) results

6) GOPRO\_Large

6) Download Deblur Gan’s Dataset at <https://drive.google.com/file/d/1H0PIXvJH4c40pk7ou6nAwoxuR4Qh_Sa2/view?usp=sharing> and extract the zip file into the deblur-gan/GOPRO\_Large folder

Code Execution:

To run the SR-GAN code , just run the cells of the SRGAN.ipynb file

Install anaconda with python 3.5.x or 3.6.x

Execute the following commands in the order as follows:

pip install -r requirements/requirements.txt

pip install -e .

cd into deblur-gan directory

To create the training and testing set do the following:

python scripts/organize\_gopro\_dataset.py --dir\_in=GOPRO\_Large --dir\_out=images

Run the following commands:

# **Training**

python scripts/train.py --n\_images=512 --batch\_size=16 --log\_dir /path/to/log/dir

# 

# **Testing from Test dataset**

python scripts/test.py

The outputs of the above will be the blurry image, the original image and the deburred image.

# **How to use the UI**

* Open 2 Anaconda command prompts from deblur-gan directory:

Run: python scripts/app.py

Run: python api.py

* Type localhost:3000 in your browser url
* Click on the upload button in the top right of the screen

**Types of Input Scenarios:**

**Take your own image from webcam and apply blur**

1. Click on take a snap.
2. Save the image as original.png under the folder deblur-gan/original
3. Click on any one of the buttons which apply a filter:
4. Wait for response code 200 on the terminal which is running app.py.
5. Click on “view imgs side by side”

Open the folder output\_all and view output.png,

it will contain the 4 Images will be in the order:

original image, blurry image, deblurred image, deblurred+super-resolved image.

1. Click on view deblurred image, view super-resolved image to see the psnr values (Viewing the images on each of the button presses only works on Internet explorer as the other browsers have some privacy issues).

**Upload an original image and pre-blurred image**

1. Save the blurred image as input.png under deblur-gan/input\_images.
2. Save the original image as original.png under deblur-gan/original.
3. Click on process image.
4. Wait for response code 200 on the terminal which is running app.py.
5. Click on “view imgs side by side”
6. Open the folder output\_all and view output.png,

it will contain the 4 Images will be in the order:

original image, blurry image, deblurred image, deblurred+super-resolved image.

1. Click on view deblurred image, view super-resolved image to see the psnr values (Viewing the images on each of the button presses only work on Internet explorer as the other browsers have some privacy issue).