Final

September 13, 2020

https://www.youtube.com/watch?v=2ZwYjY4_Wj0

0.0.1 Colab link to for ESRGAN

https://colab.research.google.com/github/AhabbscienceStudioPak/ESRGAN/blob/master/ESRGAN_Colab.i

0.0.2 Steps use to enhance the image using ESRGAN:

- Use pretrained model of **ESRGAN** and pass image throgh it
- Brightened the image
- Sharpen the image
- Added Contrast to the image
- Test the output using OCR technique

Note : Here PIL libraray has been used.

```python
[6]: import cv2
     import matplotlib.pyplot as plt
     import numpy as np
     from PIL import Image, ImageEnhance
```

0.0.3 Image from ESRGAN

```python
[7]: plt.rcParams['figure.figsize'] = [12, 8]
     image = cv2.imread('passbook_esrgan.png')
     image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
     plt.imshow(image)
     plt.title('Original Image form ESRGAN')
     plt.show()
     print(image.shape)
```
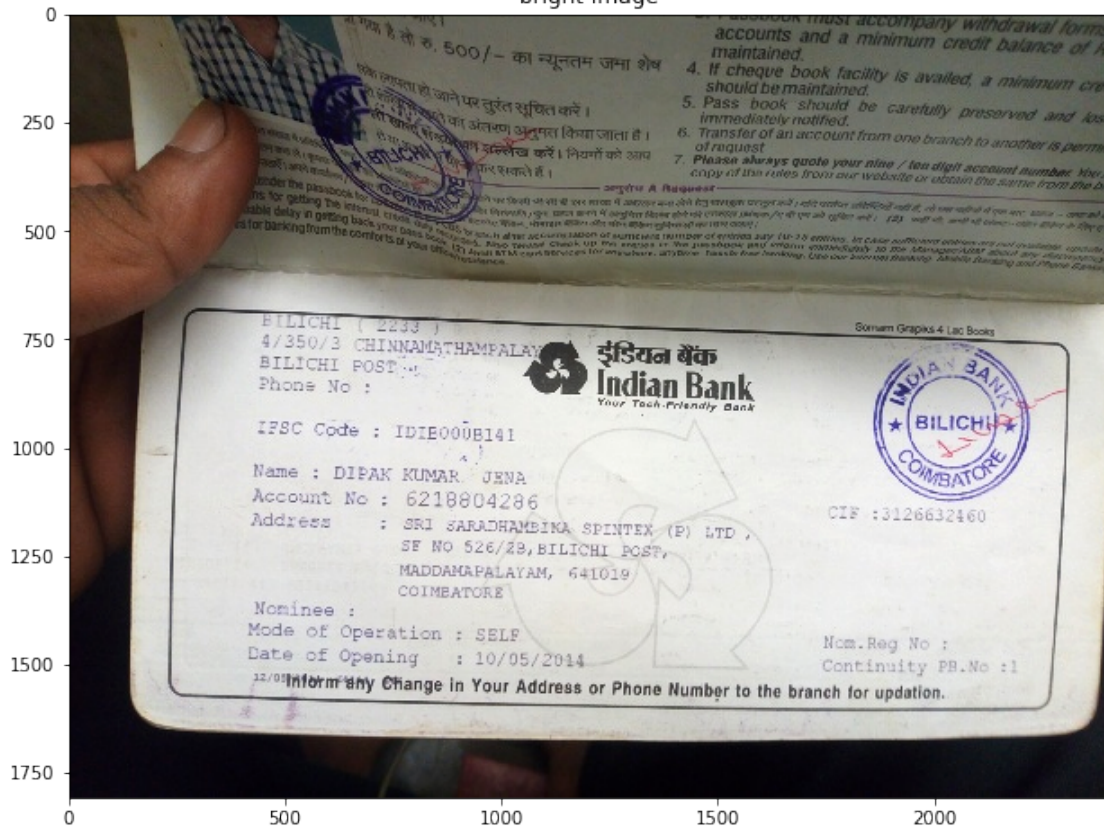
Original Image form ESRGAN
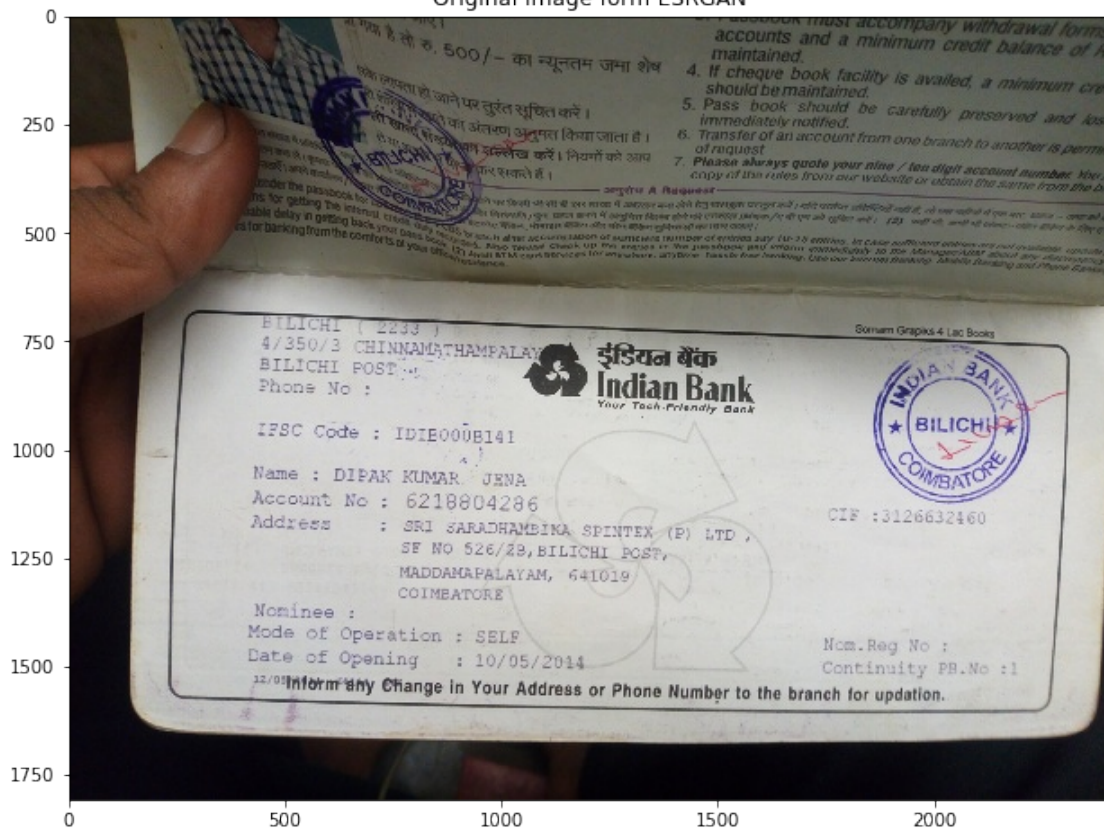
```
(1808, 2408, 3)
```

0.0.4 Bright Image

```python
from PIL import Image, ImageEnhance
im = Image.open("passbook_esrgan.png")
enhancer = ImageEnhance.Brightness(im)
bright = enhancer.enhance(1.1)
plt.imshow(bright)
plt.title('bright Image')
plt.show()
```

bright Image

0.0.5 Contrast Image

```
[9]: enhancer2 = ImageEnhance.Contrast(bright)
     contrast = enhancer2.enhance(1.3)
     plt.imshow(contrast)
     plt.title('contrast Image')
     plt.show()
```
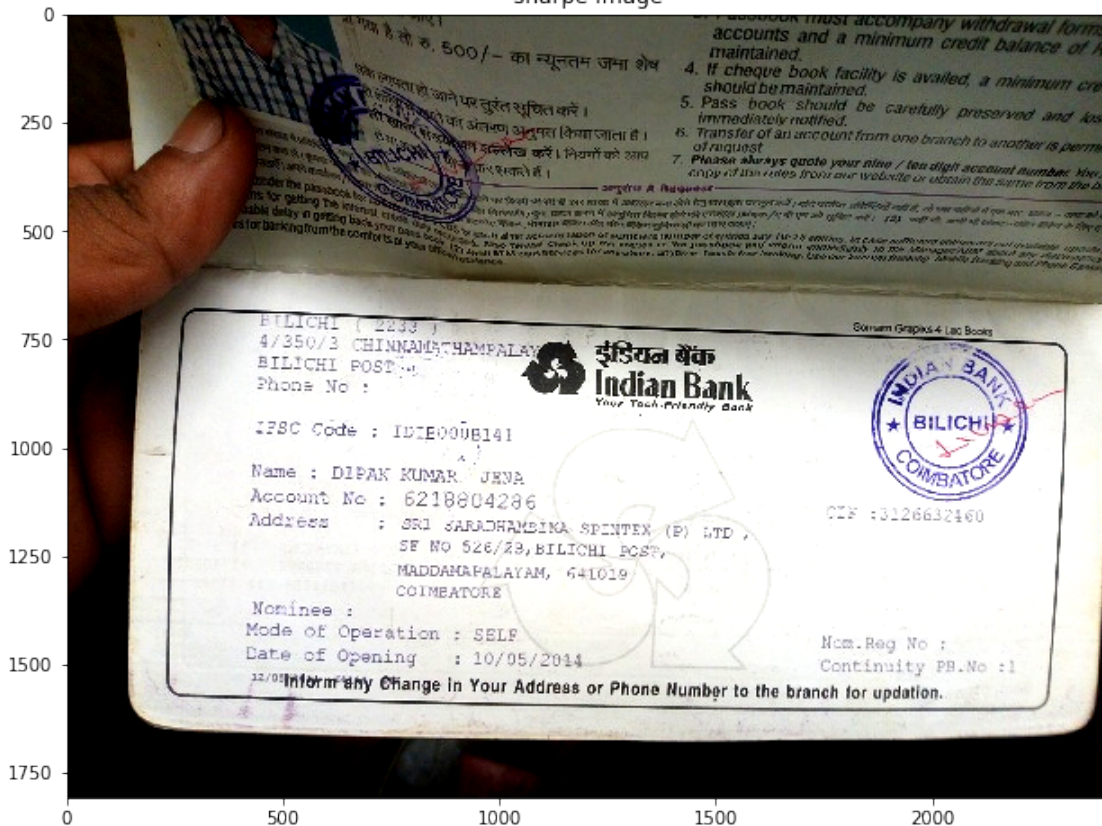
contrast Image

0.0.6 Sharpe Image

```
[10]: enhancer1 = ImageEnhance.Sharpness(contrast)
      sharpe = enhancer1.enhance(3.0)
      plt.imshow(sharpe)
      plt.title('sharpe Image')
      plt.show()
```

sharpe Image

0.0.7 Results from OCR Technique

```
[11]: import pytesseract
      pytesseract.pytesseract.tesseract_cmd=r'E:/pytesseract/tesseract.exe'
```

```
[12]: text = pytesseract.image_to_string(sharpe)
      print(text)
```

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0.0.8   Steps use to enhance the image without using ESRGAN:

- Use original image
- Brightened the image
- Sharpen the image
- Added Contrast to the image
- Test the output using OCR technique

Note : Here PIL libraray has been used.

```python
[13]: import cv2
      import matplotlib.pyplot as plt
      import numpy as np
      from PIL import Image, ImageEnhance
```

0.0.9   Original Image

```python
[14]: plt.rcParams['figure.figsize'] = [12, 8]
      image = cv2.imread('passbook.jpg')
      image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
      plt.imshow(image)
      plt.title('Original Image form ESRGAN')
      plt.show()
      print(image.shape)
```
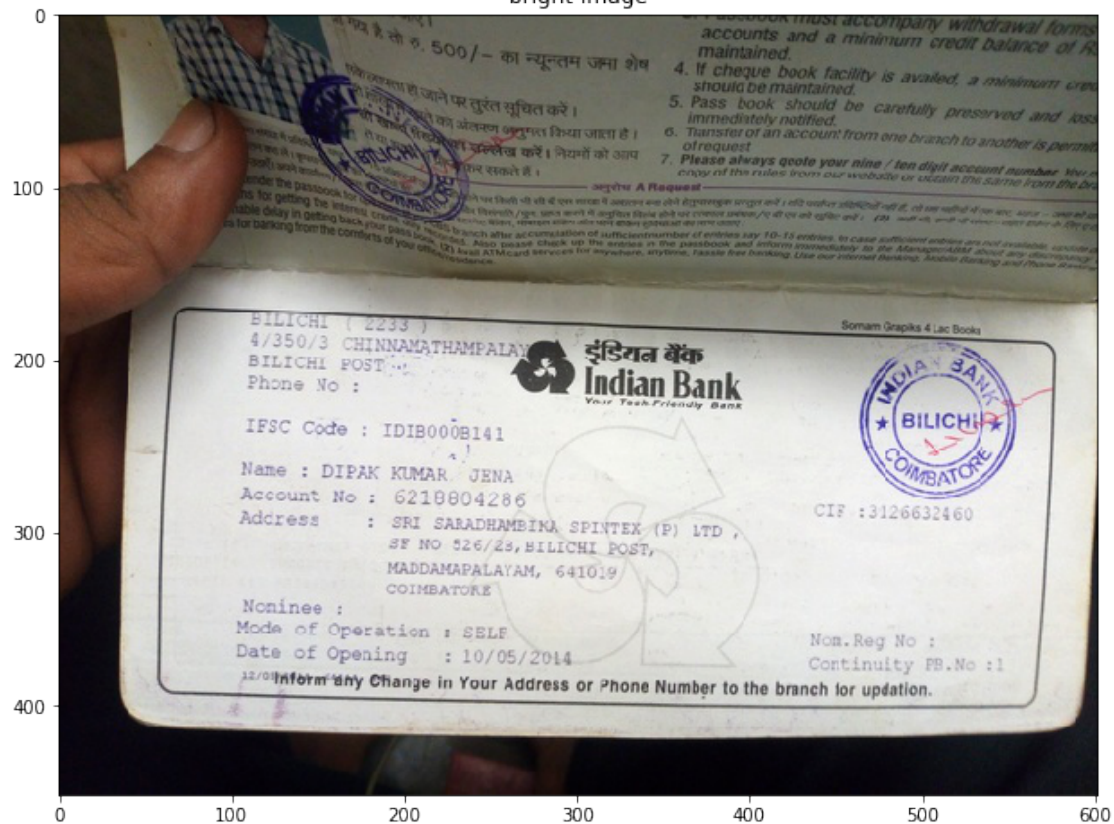
Original Image form ESRGAN
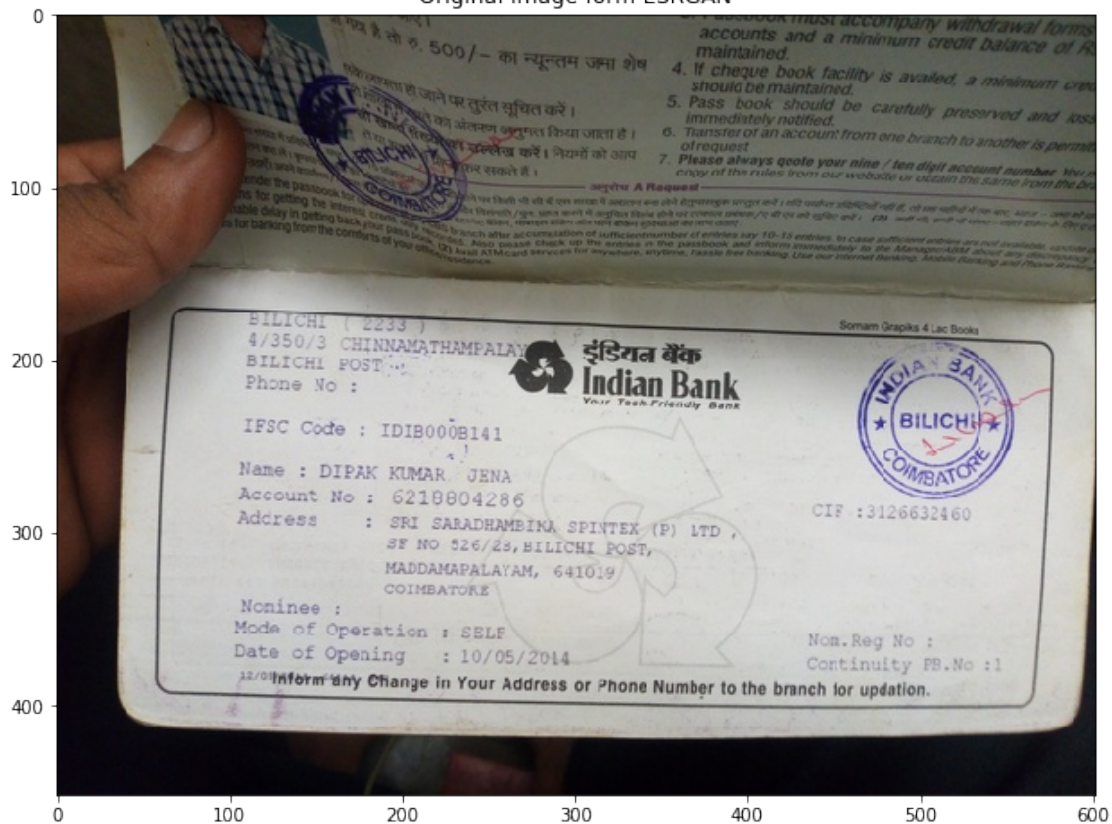
(452, 602, 3)

0.0.10 Bright Image

```python
from PIL import Image, ImageEnhance
im = Image.open("passbook.jpg")
enhancer = ImageEnhance.Brightness(im)
bright = enhancer.enhance(1.1)
plt.imshow(bright)
plt.title('bright Image')
plt.show()
```

bright Image

0.0.11 Contrast Image

```
[16]: enhancer2 = ImageEnhance.Contrast(bright)
      contrast = enhancer2.enhance(1.3)
      plt.imshow(contrast)
      plt.title('contrast Image')
      plt.show()
```
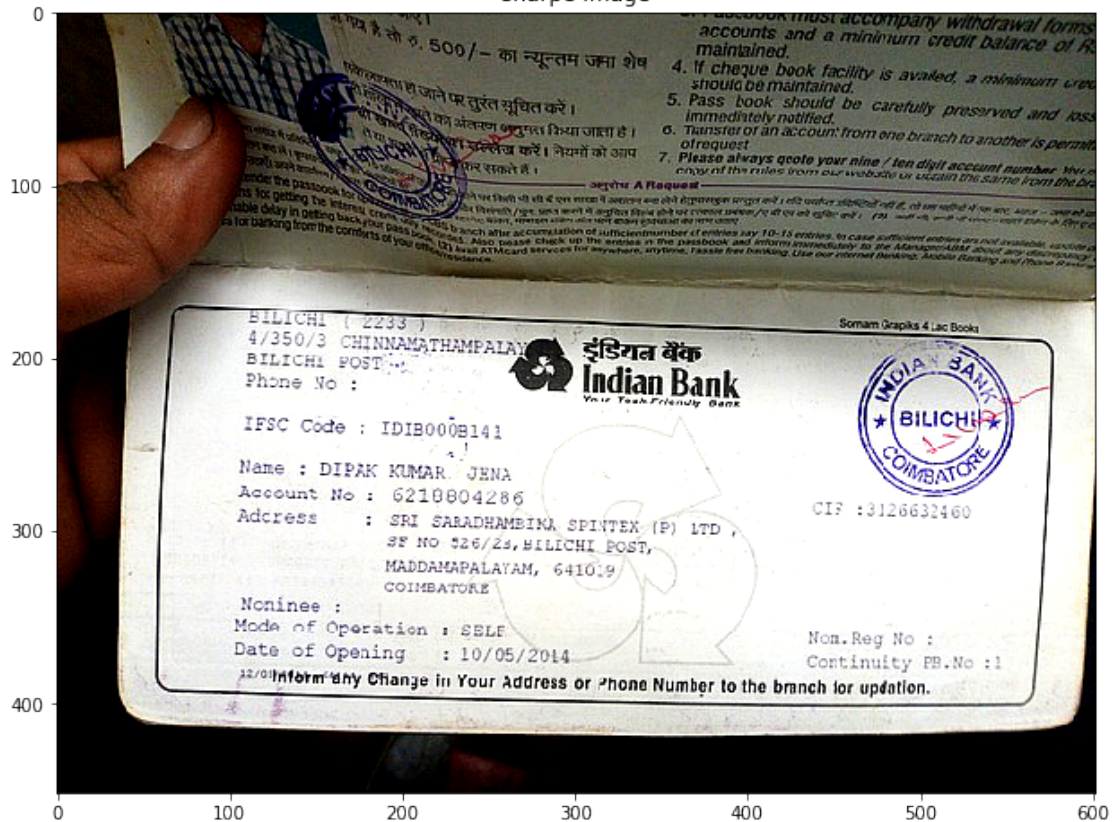
contrast Image

0.0.12 Sharpe Image

```
[17]: enhancer1 = ImageEnhance.Sharpness(contrast)
      sharpe = enhancer1.enhance(3.0)
      plt.imshow(sharpe)
      plt.title('sharpe Image')
      plt.show()
```

sharpe Image

0.0.13 Results from OCR Technique

```
[18]: text = pytesseract.image_to_string(sharpe)
      print(text)
```

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ge in Your Address or Phone Number to the branch for updation.
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0.0.14 To check the brightness of an image

```
[20]: import sys
      from PIL import Image


      def calculate_brightness(image):
          greyscale_image = image.convert('L')
          histogram = greyscale_image.histogram()
```

```python
    pixels = sum(histogram)
    brightness = scale = len(histogram)

    for index in range(0, scale):
        ratio = histogram[index] / pixels
        brightness += ratio * (-scale + index)

    return 1 if brightness == 255 else brightness / scale


if __name__ == '__main__':
    for file in sys.argv[1:]:
        image = Image.open('passbook_esrgan.png')
        print("%s\t%s" % (file, calculate_brightness(image)))
```

```
-f      0.5135893941861389
C:\Users\ajink\AppData\Roaming\jupyter\runtime\kernel-50cc1387-fe94-41d6-846e-b6
050cc7c0ee.json 0.5135893941861389
```

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0.0.15 OpenCV technique to Resize the image

```python
[24]: image = cv2.imread("passbook.jpg")
      stretch_near = cv2.resize(image, (512, 512),
                    interpolation = cv2.INTER_NEAREST)
      plt.imshow(stretch_near)
      plt.title('Resize Image')
      plt.show()
      print(image.shape)
      print(stretch_near.shape)
```

Resize Image

(452, 602, 3)
(512, 512, 3)

[ ]: