

MainSolution

February 19, 2020

1 1.

```
: , .  
: 512x512x3. : 512x512. : Dice coefficient.  
: [?]
```

```
In [1]: import os  
        os.chdir("../")  
  
        import cv2  
        import json  
        import numpy as np  
        import pandas as pd  
        import matplotlib.pyplot as plt  
        from PIL import Image  
  
        from glob import glob  
  
        from lib import *  
  
        import getpass  
  
        #password = getpass.getpass()  
        #command_install_latex = "sudo -S apt-get install texlive-latex-extra"  
        #os.system('echo %s | %s' % (password, command_install_latex))  
        #command_install_bibtex = "sudo -S apt-get install texlive-bibtex-extra"  
        #os.system('echo %s | %s' % (password, command_install_bibtex))
```

2 2.

2.1 2.1

- ```
, , .
:

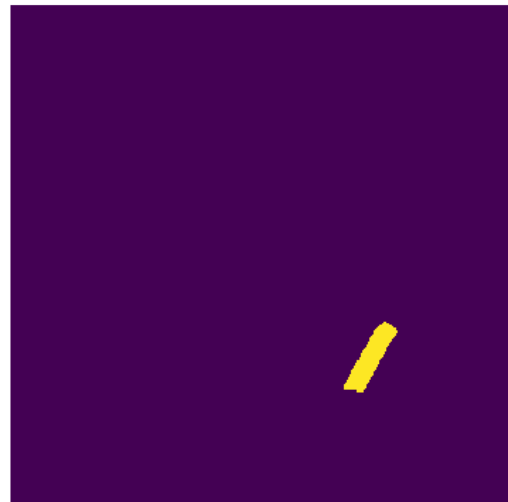
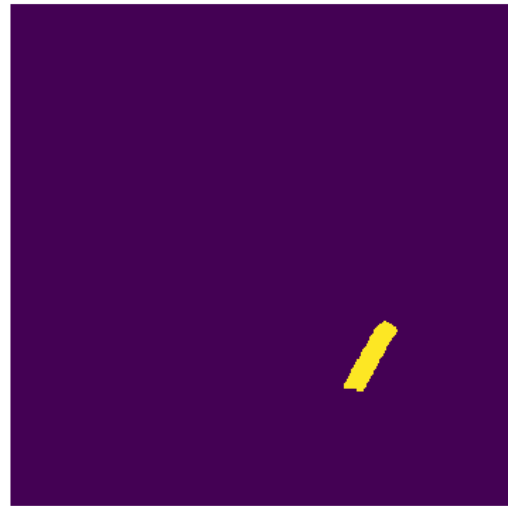
• real_test 10 512x512x3;
• train/images 2000 512x512x3;
```

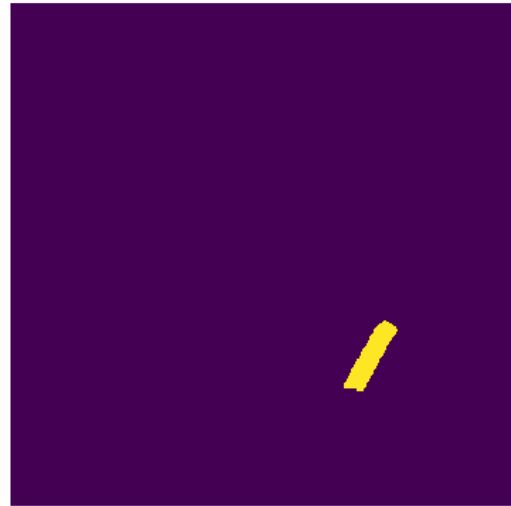
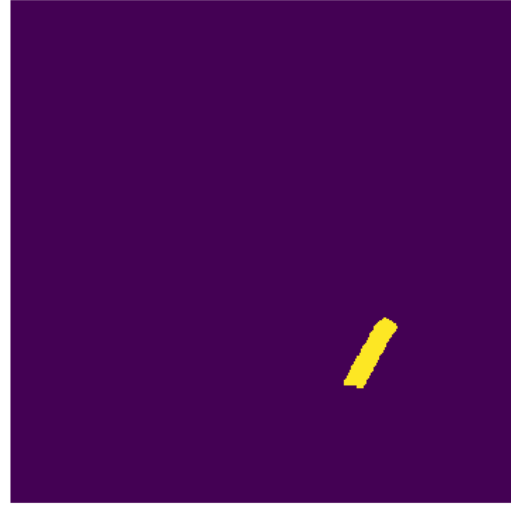
- train/coco\_annotations.json COCO;
- val/images 200 512x512x3;
- val/coco\_annotations.json COCO.

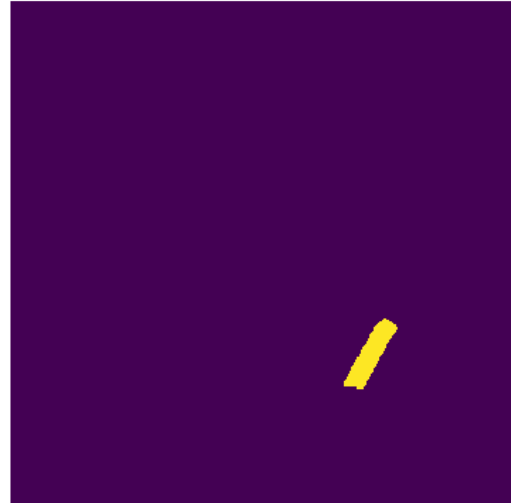
In [6]: `from itertools import repeat, cycle`

```
path = "data/train"
images = os.listdir(f"{path}/images")
annotations = json.load(open(f"{path}/coco_annotations.json", "r"))
img_ids = list(repeat(int(np.random.choice(images).split(".")[0]), 5))

for i in range(5):
 img = np.array(Image.open(f"{path}/images/{img_ids[i]:08}.jpg"))
 mask = get_mask(img_id, annotations)
 show_img_with_mask(img, mask)
```







## 2.2 2.2

2, :

- valid pred\_valid\_template.csv
- html real\_test html .

## 3 3.

### 3.1 3.1

#### 3.1.1 :

- Rotation
- Padding UNet type architecture require input image size be divisible by  $2^N$ , where  $N$  is the number of the maxpooling layers. In the vanilla UNet  $N = 5 \implies$  we need to pad input images to the closest divisible by  $2^5 = 32$  number which is 128. This operation may be performed using PadIfNeeded transformation. Which pads both image and mask on all four sides. Padding type (zero, constant, reflection) may be specified. Default padding is reflection padding.

#### 3.1.2 :

- Non-rigid transformations(ElasticTransform, GridDistortion, OpticalDistortion): , ,

#### 3.1.3 :

- Blur, : -

## 3.2 3.2

### 3.2.1 :

- U-Net (*U-Net: Convolutional Networks for Biomedical Image Segmentation* O. Ronneberger, P. Fischer, and T. Brox. page 234--241. Springer International Publishing, Cham, (2015))
- RetinaNet
- Mask- RCNN

## 3.3 4.

In [ ]: