image_segmentation

July 2, 2022

1 Segmenter une image pixel à pixel

Il est aujourd'hui assez facile de construire une boîte englobante autour d'un visage dans une image. Le deep learning permet d'extraire précisément les pixels du visage.

[1]:
```
from jyquickhelper import add_notebook_menu
add_notebook_menu()
```

[1]:
```
<IPython.core.display.HTML object>
```

[2]:
```
%matplotlib inline
```

1.1 Chargement du modèle

[3]:
```
from code_beatrix.ai import DLImageSegmentation
model = DLImageSegmentation(fLOG=print)
```

```
[DLImageSegmentation] download model 'FCN8s'
[DLImageSegmentation] [C:\Users\xavie/data/models/chainer/fcn8s_from_caffe.npz]
Checking md5 (256c2a8235c1c65e62e48d3284fbd384)

[DLImageSegmentation] load_npz
'C:\Users\xavie/data/models/chainer/fcn8s_from_caffe.npz'
[DLImageSegmentation] class_name '['background' 'aeroplane' 'bicycle' 'bird'
'boat' 'bottle' 'bus' 'car'
 'cat' 'chair' 'cow' 'diningtable' 'dog' 'horse' 'motorbike' 'person'
 'potted plant' 'sheep' 'sofa' 'train' 'tv/monitor']'
[DLImageSegmentation] cpu
```

1.2 Sur une petite image

[4]:
```
img = 'images/Tesla_circa_1890c.jpg'
```

[5]:
```
feat, pred = model.predict(img)
pred.shape
```

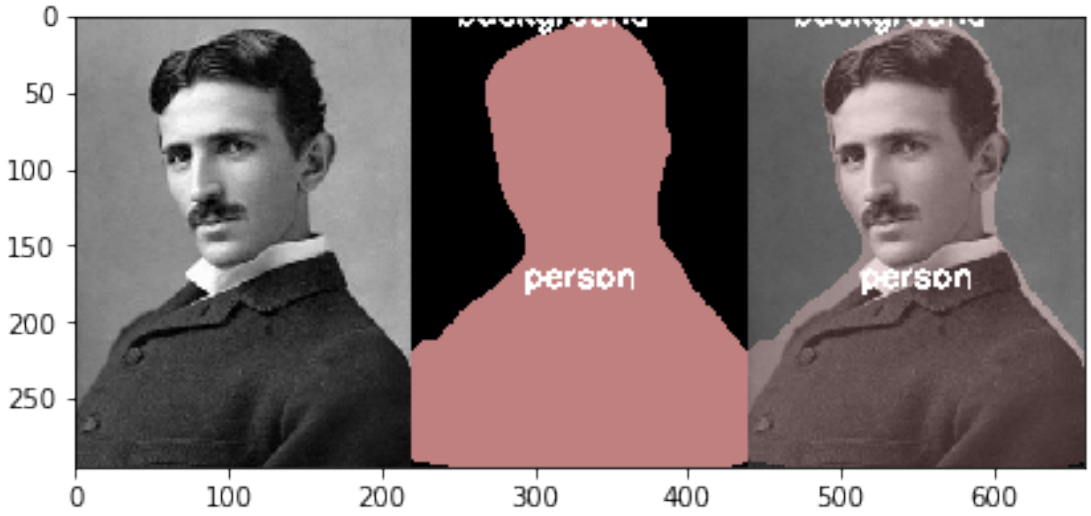
[5]:
```
(295, 220)
```

[6]:
```
viz = model.plot(img, pred)  # img ou feat
```

```
c:\Python363_x64\lib\site-packages\skimage\transform\_warps.py:84: UserWarning:
The default mode, 'constant', will be changed to 'reflect' in skimage 0.15.
  warn("The default mode, 'constant', will be changed to 'reflect' in "
```

[7]:
```
import skimage.io as skio
skio.imshow(viz)
```

[7]:
```
<matplotlib.image.AxesImage at 0x18000a1a8d0>
```



1.3 Sur une image dont on change la taille

[8]:
```
from PIL import Image
img = 'images/Tesla_circa_1890c.jpg'
pilimg = Image.open(img)
```

[9]:
```
si = pilimg.size
pilimg2 = pilimg.resize((si[0]//2, si[1]//2))
```

[10]:
```
from skimage.io._plugins.pil_plugin import pil_to_ndarray
```

[11]:
```
skimg = pil_to_ndarray(pilimg2)
skimg.shape
```

[11]:
```
(147, 110, 3)
```

[12]:
```
feat, pred = model.predict(skimg)
pred.shape
```

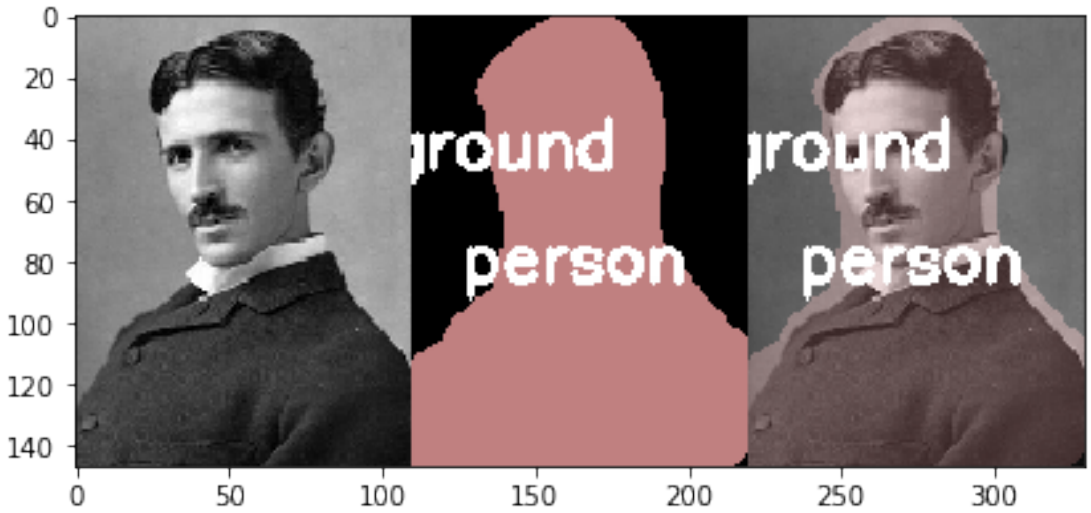
[12]:
```
(147, 110)
```

[13]:
```
viz = model.plot(skimg, pred)
```

```
c:\Python363_x64\lib\site-packages\skimage\transform\_warps.py:84: UserWarning:
The default mode, 'constant', will be changed to 'reflect' in skimage 0.15.
  warn("The default mode, 'constant', will be changed to 'reflect' in "
```

[14]:
```
skio.imshow(viz)
```

[14]:
```
<matplotlib.image.AxesImage at 0x18001a8bd68>
```



1.4 Sur une grande image

[15]:
```
img = 'images/h2015_2.jpg'
```

[16]:
```
pilimg = Image.open(img)
```

[17]:
```
si = pilimg.size
pilimg2 = pilimg.resize((si[0]//2, si[1]//2))
```

[18]:
```
skimg = pil_to_ndarray(pilimg2)
skimg.shape
```

[18]:
```
(456, 684, 3)
```

[19]:
```
skio.imshow(skimg)
```

[19]:
```
<matplotlib.image.AxesImage at 0x1800210b9e8>
```

[20]:
```
feat, pred = model.predict(skimg)
pred.shape
```

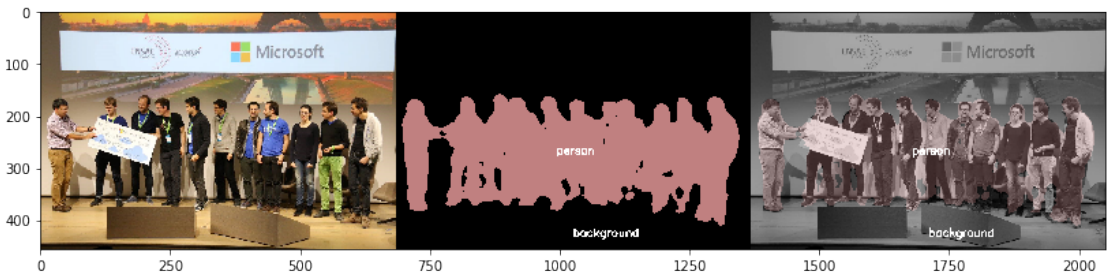
[20]: (456, 684)

[21]:
```
viz = model.plot(feat, pred)
```

```
c:\Python363_x64\lib\site-packages\skimage\transform\_warps.py:84: UserWarning:
The default mode, 'constant', will be changed to 'reflect' in skimage 0.15.
  warn("The default mode, 'constant', will be changed to 'reflect' in "
```

[22]:
```
import matplotlib.pyplot as plt
fig, ax = plt.subplots(1, 1, figsize=(14, 12))
ax.imshow(viz)
```

[22]: <matplotlib.image.AxesImage at 0x1800216b9e8>



[23]: