

```
In [3]: import cv2
import matplotlib.pyplot as plt
import numpy as np

import glob, os
```

```
In [4]: def extract_label(img_path):
    filename, _ = os.path.splitext(os.path.basename(img_path))

    subject_id, etc = filename.split('__')
    gender, lr, finger, _ = etc.split('_')

    gender = 0 if gender == 'M' else 1
    lr = 0 if lr == 'Left' else 1

    if finger == 'thumb':
        finger = 0
    elif finger == 'index':
        finger = 1
    elif finger == 'middle':
        finger = 2
    elif finger == 'ring':
        finger = 3
    elif finger == 'little':
        finger = 4

    return np.array([subject_id, gender, lr, finger], dtype=np.uint16)

def extract_label2(img_path):
    filename, _ = os.path.splitext(os.path.basename(img_path))

    subject_id, etc = filename.split('__')
    gender, lr, finger, _, _ = etc.split('_')

    gender = 0 if gender == 'M' else 1
    lr = 0 if lr == 'Left' else 1

    if finger == 'thumb':
        finger = 0
    elif finger == 'index':
        finger = 1
    elif finger == 'middle':
        finger = 2
    elif finger == 'ring':
        finger = 3
    elif finger == 'little':
        finger = 4

    return np.array([subject_id, gender, lr, finger], dtype=np.uint16)
```

```
In [6]: img_list = sorted(glob.glob('SOCOFing/Real/*.BMP'))
print(len(img_list))

imgs = np.empty((len(img_list), 96, 96, 3), dtype=np.uint8)
labels = np.empty((len(img_list), 4), dtype=np.uint16)

for i, img_path in enumerate(img_list):
    img = cv2.imread(img_path)
    img = cv2.resize(img, (96, 96))
    imgs[i] = img
```

```
# subject_id, gender, lr, finger
labels[i] = extract_label(img_path)

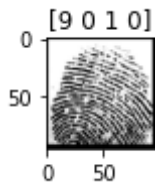
np.savez('dataset_c/x_real.npz', data=imgs)
np.save('dataset_c/y_real.npy', labels)

plt.figure(figsize=(1, 1))
plt.title(labels[-1])
plt.imshow(imgs[-1])
```

6000

C:\Users\ArcherSeven\anaconda3\envs\ai37\lib\site-packages\matplotlib\text.py:122  
 3: FutureWarning: elementwise comparison failed; returning scalar instead, but in  
 the future will perform elementwise comparison  
 if s != self.\_text:

Out[6]: <matplotlib.image.AxesImage at 0x179a9c46a08>



In [7]: `img_list = sorted(glob.glob('SOCOFing/Altered/Altered-Easy/*.BMP'))`  
`print(len(img_list))`

```
imgs = np.empty((len(img_list), 96, 96, 3), dtype=np.uint8)
labels = np.empty((len(img_list), 4), dtype=np.uint16)
```

```
for i, img_path in enumerate(img_list):
    img = cv2.imread(img_path)
    img = cv2.resize(img, (96, 96))
    imgs[i] = img
```

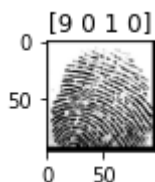
```
# subject_id, gender, lr, finger
labels[i] = extract_label2(img_path)
```

```
np.savez('dataset_c/x_easy.npz', data=imgs)
np.save('dataset_c/y_easy.npy', labels)
```

```
plt.figure(figsize=(1, 1))
plt.title(labels[-1])
plt.imshow(imgs[-1])
```

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Out[7]: <matplotlib.image.AxesImage at 0x179ad610548>



In [8]: `img_list = sorted(glob.glob('SOCOFing/Altered/Altered-Medium/*.BMP'))`  
`print(len(img_list))`

```
imgs = np.empty((len(img_list), 96, 96, 3), dtype=np.uint8)
labels = np.empty((len(img_list), 4), dtype=np.uint16)
```

```
for i, img_path in enumerate(img_list):
    img = cv2.imread(img_path)
    img = cv2.resize(img, (96, 96))
```

```

    imgs[i] = img

    # subject_id, gender, lr, finger
    labels[i] = extract_label2(img_path)

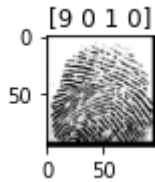
np.savez('dataset_c/x_medium.npz', data=imgs)
np.save('dataset_c/y_medium.npy', labels)

plt.figure(figsize=(1, 1))
plt.title(labels[-1])
plt.imshow(imgs[-1])

```

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Out[8]: <matplotlib.image.AxesImage at 0x179aa6ba7c8>



```

In [9]: img_list = sorted(glob.glob('SOCOFing/Altered/Altered-Hard/*.BMP'))
        print(len(img_list))

        imgs = np.empty((len(img_list), 96, 96, 3), dtype=np.uint8)
        labels = np.empty((len(img_list), 4), dtype=np.uint16)

        for i, img_path in enumerate(img_list):
            img = cv2.imread(img_path)
            img = cv2.resize(img, (96, 96))
            imgs[i] = img

            # subject_id, gender, lr, finger
            labels[i] = extract_label2(img_path)

        np.savez('dataset_c/x_hard.npz', data=imgs)
        np.save('dataset_c/y_hard.npy', labels)

        plt.figure(figsize=(1, 1))
        plt.title(labels[-1])
        plt.imshow(imgs[-1])

```

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Out[9]: <matplotlib.image.AxesImage at 0x179aa42f048>

