Script

March 22, 2019

1 This demo uses dataset of raw T1 structual MRI images collected by Steve.

1.1 After normalization.

1.2 *Without* mean value subtracted

541 subjects in total.
from 6 to 85 years old.
10% for test, 90% for training.
Because of the incompatible in the pixdim and dim, we get rid of three images from the dataset:

- A00058503
- A00058952
- A00059344

Two images are missing according to the phenotypic information:

- A00040181
- A00039084

```
In [1]: %load_ext autoreload
        %autoreload 2
        %matplotlib inline
```
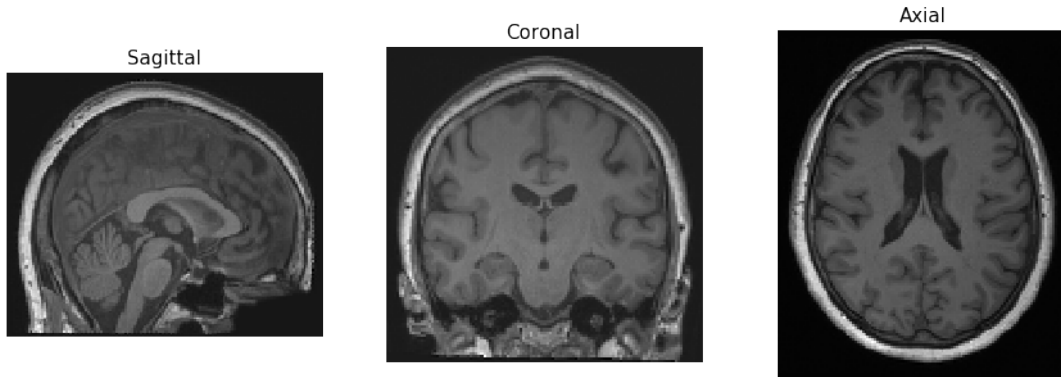
```
In [2]: from preprocess import *
```

2 The raw image

2.1 Some images looks like this:

```
In [3]: nii_img = nib.load('/media/woody/Elements/Steve_age_data/ANAT_normalized/A00008326.nii')
        npy_img = nii_img.get_data()
        print2d(npy_img)
```
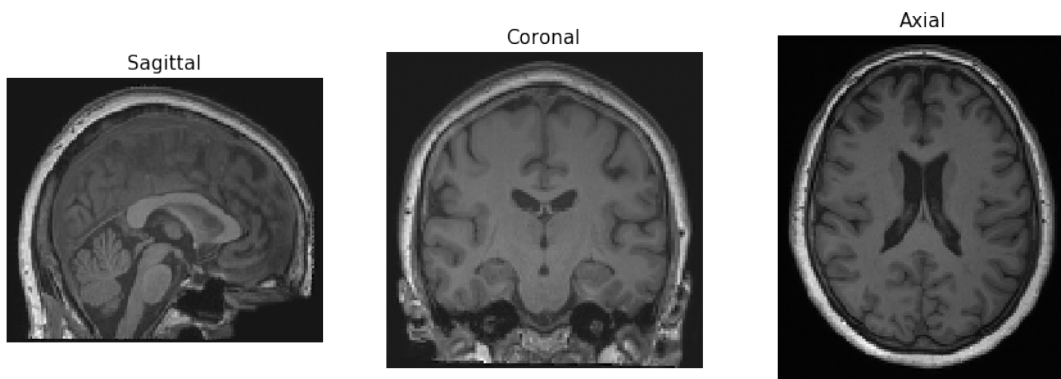
```
Dimension:  (121, 145, 121)
```

2.2 Finally, the images fed into the model is the .npy files read from .nii:

```
In [6]: final_img = np.load('../data_npy/origin/A00008326.npy')
        print2d(final_img)

Dimension:  (121, 145, 121)
```


3 Training and test results

3.1 Training process

```
In [7]: def subdraw(ax,filename):
            arr = np.load(filename)
            ax.plot(arr[0], np.log(arr[1]),label='training')
            ax.plot(arr[2], np.log(arr[3]),label='validation')
            ax.legend(fontsize=12)
```

```python
        ax.set_xlabel('step',fontsize=12)
        ax.set_ylabel('RMSE (natrual log)',fontsize=12)

    f, (ax1, ax2) = plt.subplots(1, 2, figsize=(15,5))
    subdraw(ax=ax1,filename='./img/demo_1_1_pltdata_2019.03.22.01:35:15.npy')
    ax1.set_title('Our model\'s trainning loss',fontsize=15)
    subdraw(ax=ax2,filename='./img/demo_1_2_pltdata_2019.03.22.03:03:00.npy')
    ax2.set_title('Target model\'s trainning loss',fontsize=15)
```

Out[7]: Text(0.5, 1.0, "Target model's trainning loss")
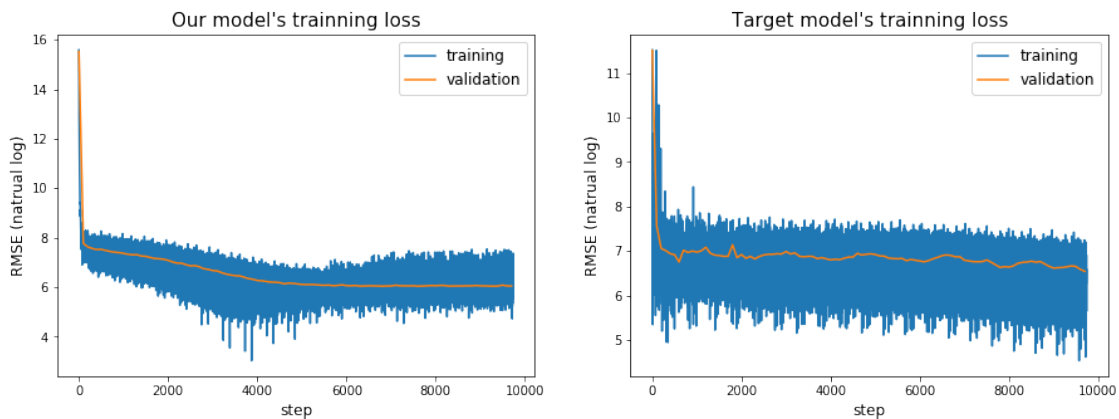
3.2   Test results

```python
In [8]: f, (ax1, ax2) = plt.subplots(1, 2, figsize=(40,20))
        ax1.imshow(plt.imread('./img/demo_1_1_test.png'))
        ax1.axis('off')
        ax1.set_title('Our model\'s test result, the correlation',fontsize=40)
        ax2.imshow(plt.imread('./img/demo_1_2_test.png'))
        ax2.axis('off')
        ax2.set_title('Target model\'s test result, the correlation',fontsize=40)
```

Out[8]: Text(0.5, 1.0, "Target model's test result, the correlation")

Our model's test result, the correlation

Target model's test result, the correlation
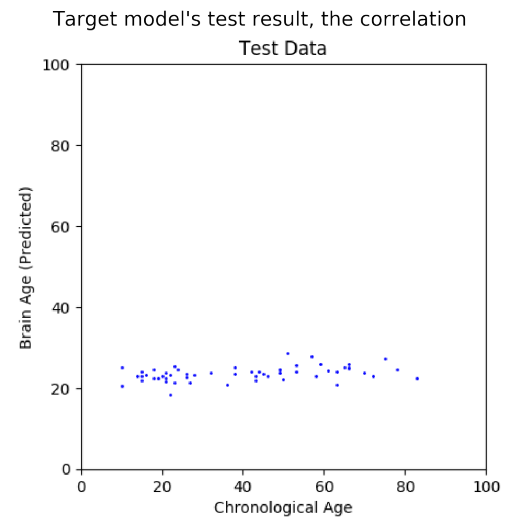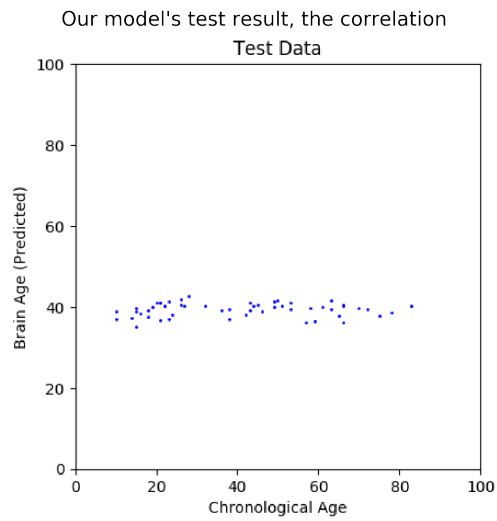
4 Conclusion

- Nothing special happend with this, which means it may not make too much difference whether or not subtracting the mean values.

In [ ]: