

Manual of FAIRT

This is an example manual of FAIRT for windows user. For linux user, the steps are similar.

Running environment

Windows10+MATLAB2018B+Anaconda3 2019.10

Constructing running environment

Step1.

Download FAIRT at

<https://github.com/cain106002/FAIRT/releases/latest>. Please note that

all six .h5 files and source code should be all downloaded.

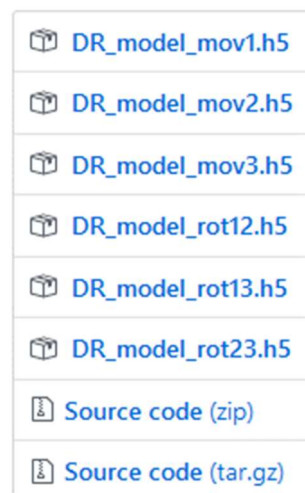


Fig.1

Step2.

Uncompress the source code. Put all files into one directory like Fig.2.

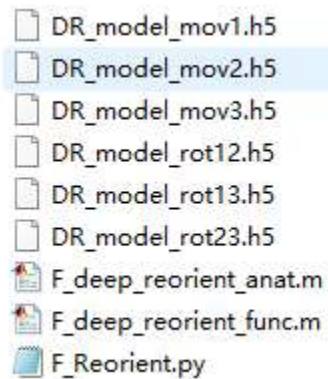


Fig.2

Step3.

Download Anaconda3.x at <https://www.anaconda.com/distribution/#download-section> and install it.

Step4.

Open anaconda prompt, and create a virtual environment named FAIRT_ENV

`conda create -n FAIRT_ENV`



Fig.3

Step5.

Activate FAIRT_ENV. If it is successful, the prefix would turn to FAIRT_ENV.

`conda activate FAIRT_ENV`

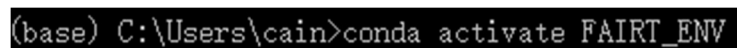


Fig.4

Install tensorflow and keras. The python running environment was constructed. Close the anaconda prompt

`pip install tensorflow`

`pip install keras`

```
(FAIRT_ENV) C:\Users\cain>pip install tensorflow
```

```
(FAIRT_ENV) C:\Users\cain>pip install keras
```

Fig.5

Preparing testing data

Step1.

Download the DATA_TEST.rar and uncompress it. The uncompressed data was as Fig.6.

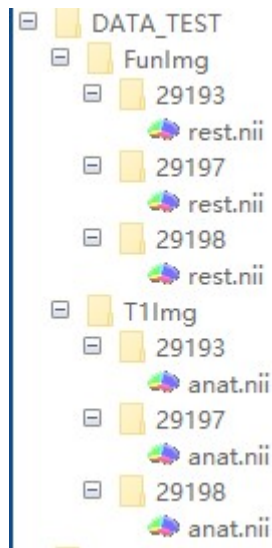


Fig.6

Step2.

The downloaded files were arranged as Fig.7

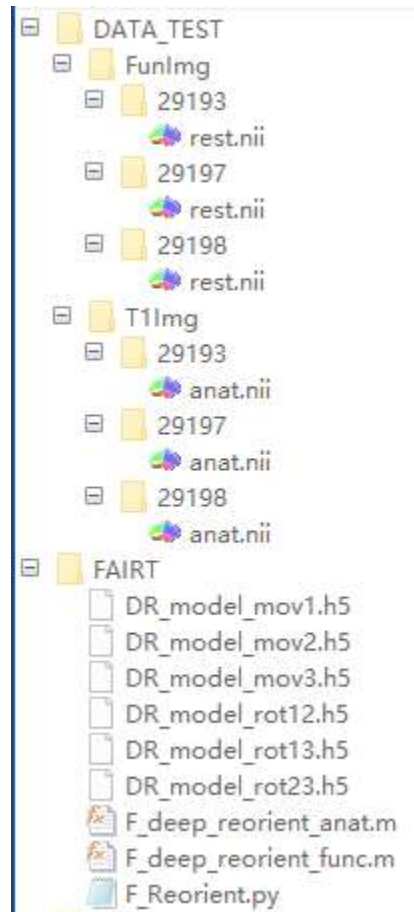


Fig.7

Example of structural T1 MRI images

Step1.

Open anaconda prompt and activate FAIRT_ENV

`conda activate FAIRT_ENV`

```
(base) C:\Users\cain>conda activate FAIRT_ENV
```

Fig.8

Step2.

Open matlab under the FAIRT_ENV. cd to the bin path of MATLAB and then type matlab

```
(FAIRT_ENV) D:\CommonSoft\MATLABR2018B\bin>matlab
```

Fig.9

Step3.

cd to the FAIRT directory in MATLAB. (important! For each run of FAIRT, it should make sure that the current directory is FAIRT directory!)

Step4.

For structural T1 MRI images, the data should be arranged as Fig.10.

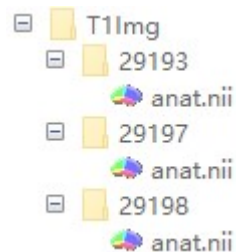


Fig.10

Run `F_deep_reorient_anat.m`. The first parameter is the directory path storing .nii files. The second parameter is the directory path storing the

output files. The third parameter is the directory path storing temporary files, it should be an empty directory and it will be deleted after the process is done.

```
F_deep_reorient_anat('..\DATA_TEST\T1Img','..\DATA_TEST\T1Img_out','..\DATA_TEST\T1Img_tmp');
```



Fig.10

Step5.

The result data was stored in DATA_TEST\T1Img_out.

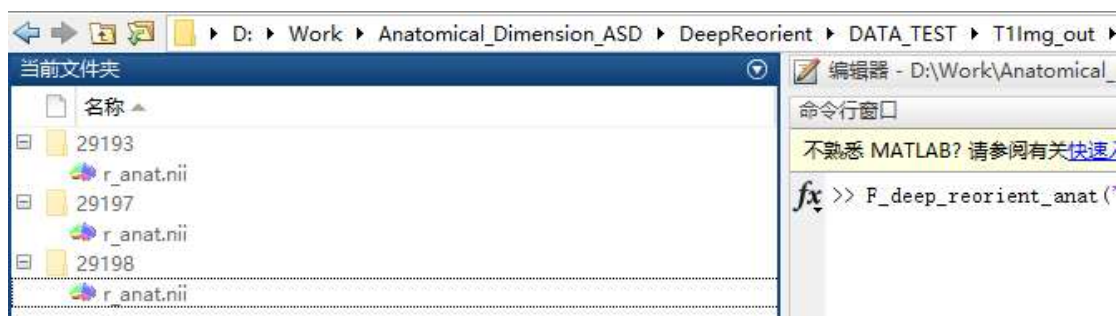


Fig.11

Example of functional MRI images

Step1.

Open anaconda prompt and activate FAIRT_ENV

```
conda activate FAIRT_ENV
```

```
(base) C:\Users\cain>conda activate FAIRT_ENV
```

Fig.12

Step2.

Open matlab under the FAIRT_ENV. cd to the bin path of MATLAB and then type matlab

```
(FAIRT_ENV) D:\CommonSoft\MATLABR2018B\bin>matlab_
```

Fig.13

Step3.

cd to the FAIRT directory in MATLAB. (important! For each run of FAIRT, it should make sure that the current directory is FAIRT directory!)

Step4.

For the reorient of functional MRI images, it should conclude functional MRI image and the corresponding T1 images. the data should be arranged as Fig.14.

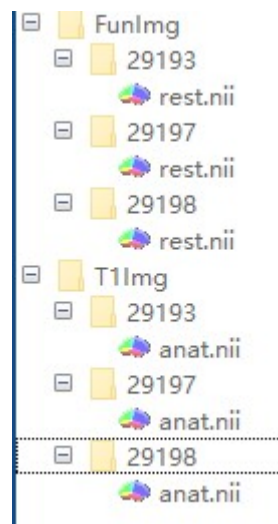


Fig.14

Run `F_deep_reorient_func.m`. The first parameter is the directory path storing functional .nii files. The second parameter is the directory path

storing T1 .nii files. The third parameter is the directory path storing the output files. The forth parameter is the directory path storing temporary files, it should be an empty directory and it will be deleted after the process is done.

```
F_deep_reorient_func('..\DATA_TEST\FunImg','..\DATA_TEST\T1I  
mg','..\DATA_TEST\FunImg_out','..\DATA_TEST\FunImg_tmp');
```



Fig.15

Step5.

The result data was stored in DATA_TEST\FunImg_out.

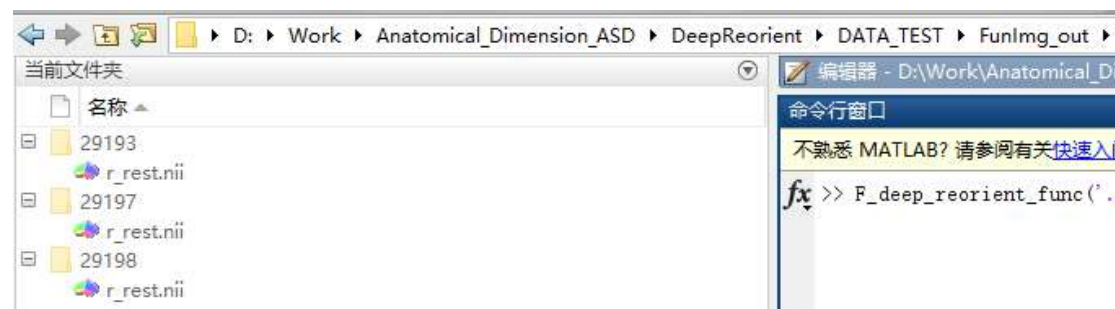


Fig.16