Basic Data Manipulation

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Read an NIfTI file

This is example to read some NIfTI files and execute some basic data manipulation, by using this example code you must be install package oro.nifti,fslr,AnalyzeFMRI first.

Download a NIfTI file from Neurohacking_data repository

```
library(oro.nifti)

url <- "https://raw.githubusercontent.com/muschellij2/Neurohacking/master/Basic_Data_Manipulations/Kirby
destfile <- "SUBJ0001-01-MPRAGE.nii.gz"
fname <- file.path(getwd(), destfile)
download.file(url, destfile,mode="wb") # NIfTI is binaryfile format

maskurl <- "https://raw.githubusercontent.com/muschellij2/Neurohacking/master/Basic_Data_Manipulations/
maskdestfile <- "SUBJ0001_mask.nii.gz"
maskfname <- file.path(getwd(), maskdestfile)
download.file(maskurl, maskdestfile,mode="wb") # NIfTI is binaryfile format



T1 <- readNIfTI(fname,reorient=FALSE)

mask <- readNIfTI(maskfname, reorient=FALSE)
```

Show meta data from MPRAGE file

```
print (T1)
```

```
## NIfTI-1 format
##   Type            : nifti
##   Data Type       : 16 (FLOAT32)
##   Bits per Pixel  : 32
##   Slice Code      : 0 (Unknown)
##   Intent Code     : 0 (None)
##   Qform Code      : 1 (Scanner_Anat)
##   Sform Code      : 0 (Unknown)
##   Dimension       : 170 x 256 x 256
##   Pixel Dimension : 1.2 x 1 x 1
##   Voxel Units     : mm
##   Time Units      : sec
```

As you see the Dimension is : 170 x 256 x 256

Show meta data from MPRAGE file

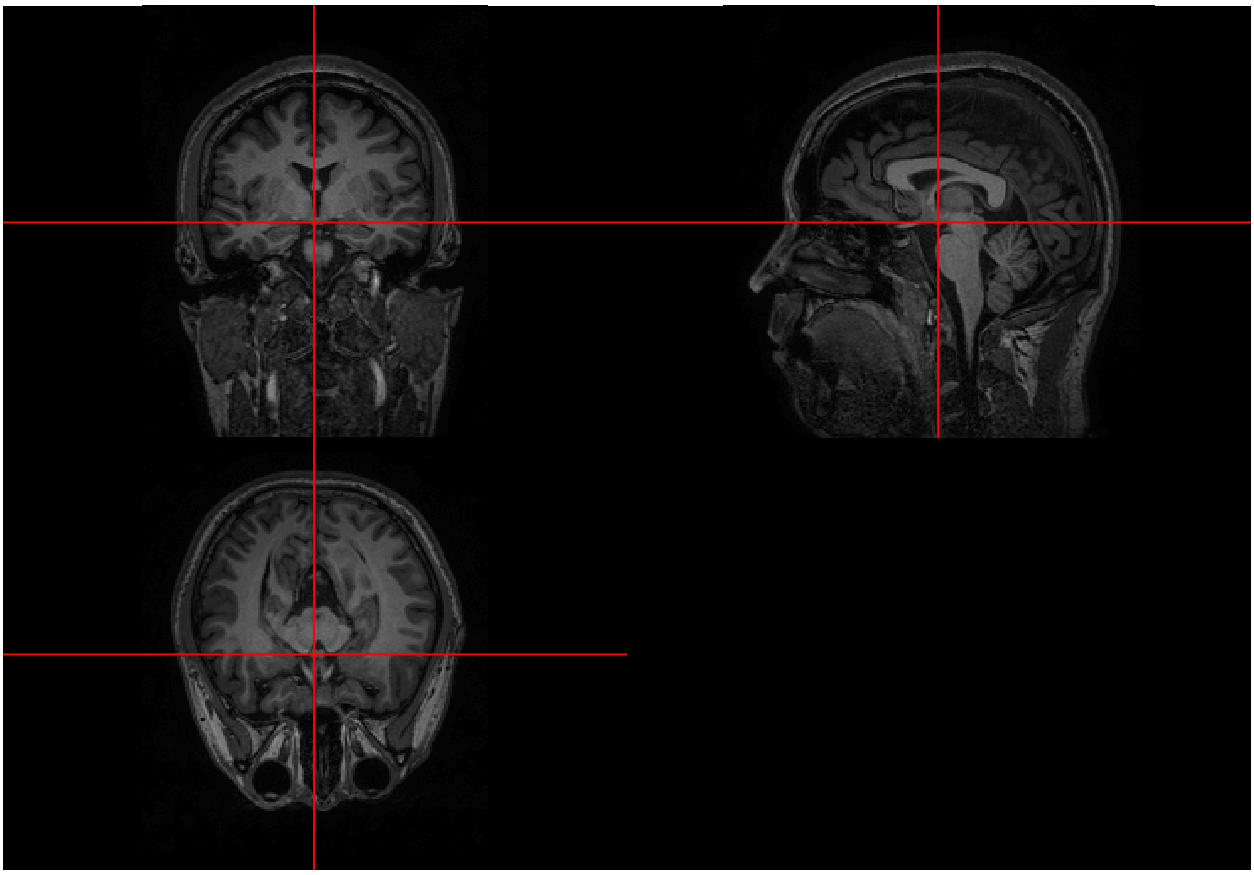
```
print (mask)
```

```
## NIfTI-1 format
##   Type            : nifti
##   Data Type       : 4 (INT16)
##   Bits per Pixel  : 16
##   Slice Code      : 0 (Unknown)
##   Intent Code     : 0 (None)
##   Qform Code      : 1 (Scanner_Anat)
##   Sform Code      : 1 (Scanner_Anat)
##   Dimension       : 170 x 256 x 256
##   Pixel Dimension : 1.2 x 1 x 1
##   Voxel Units     : mm
##   Time Units      : sec
```

As you see the of mask is same dimension (170 x 256 x 256).

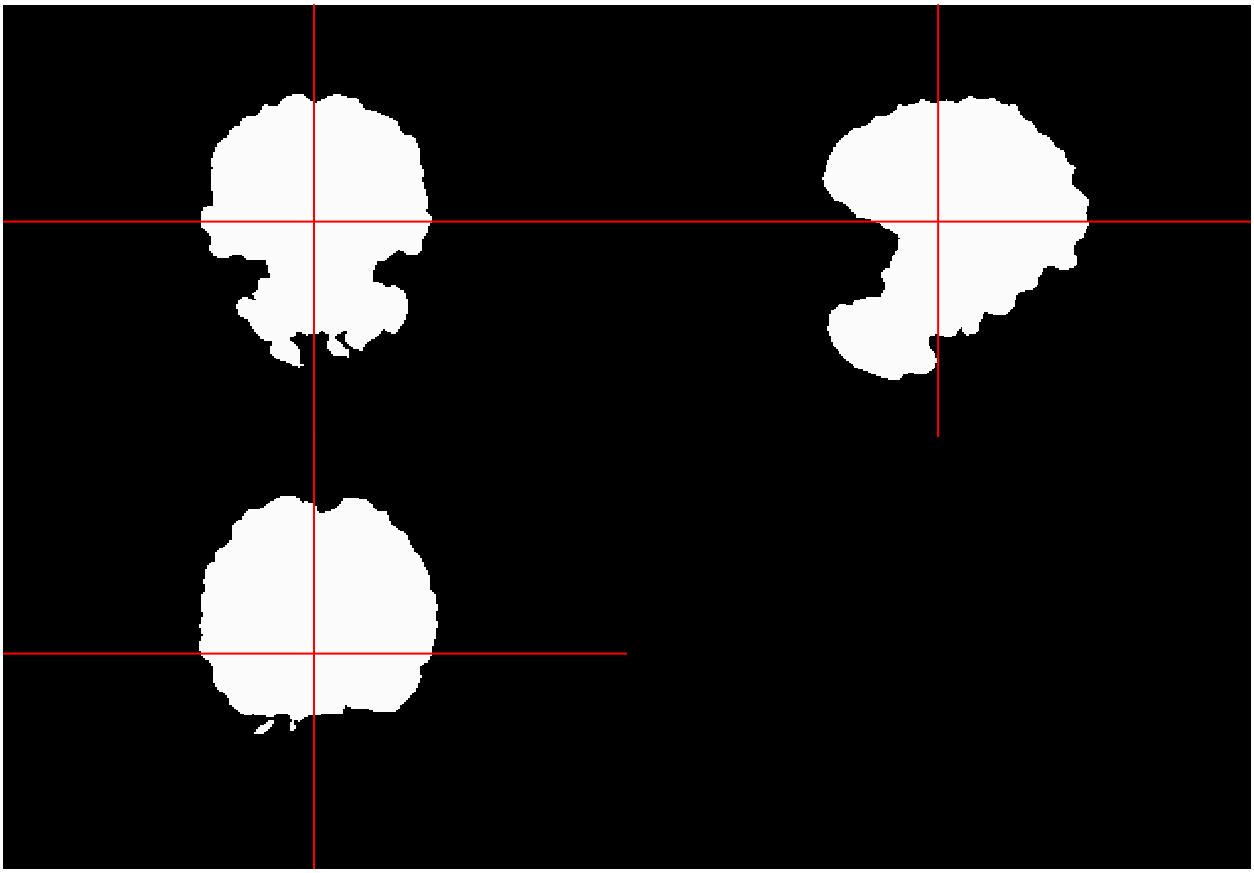
Visualizing orthographic T1

```
orthographic(T1)
```



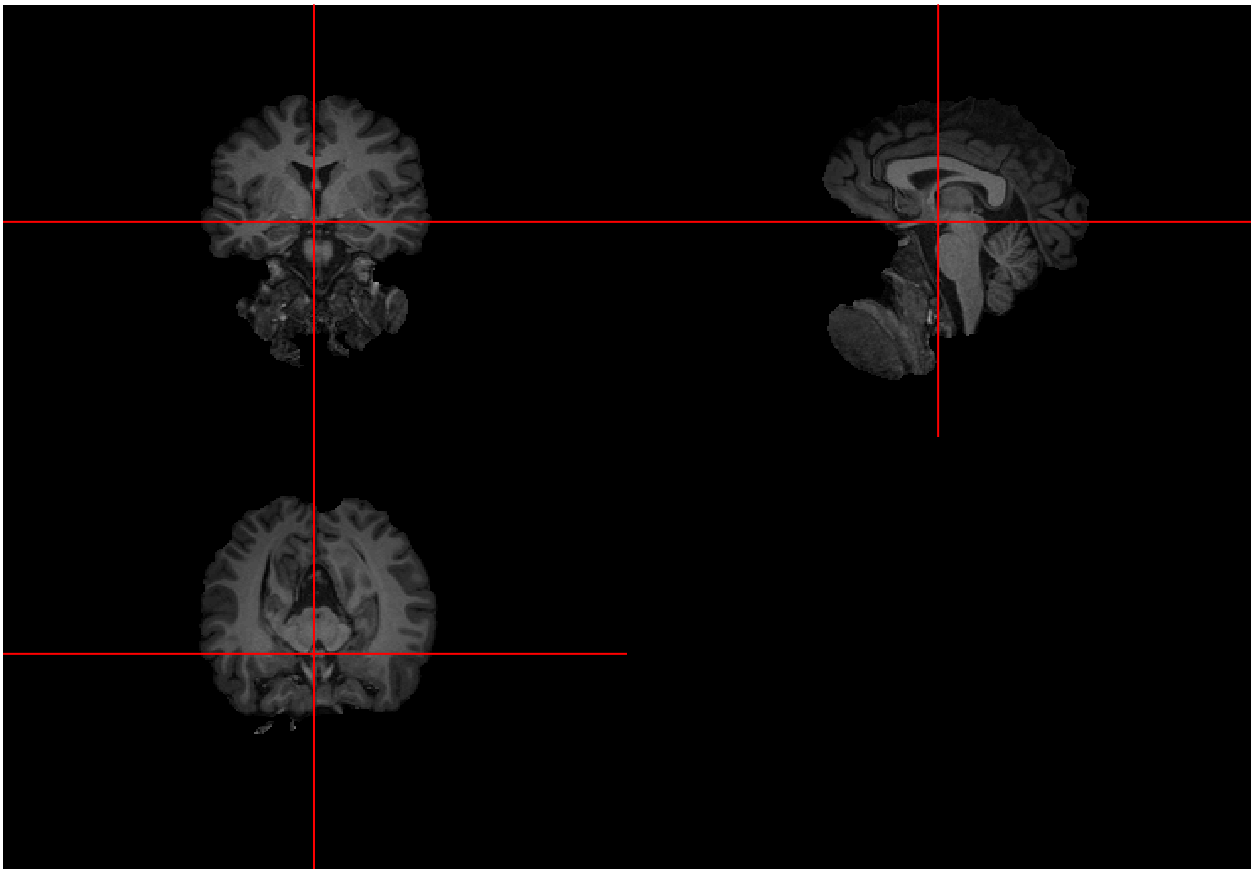
Visualizing orthographic mask

```
orthographic(mask)
```



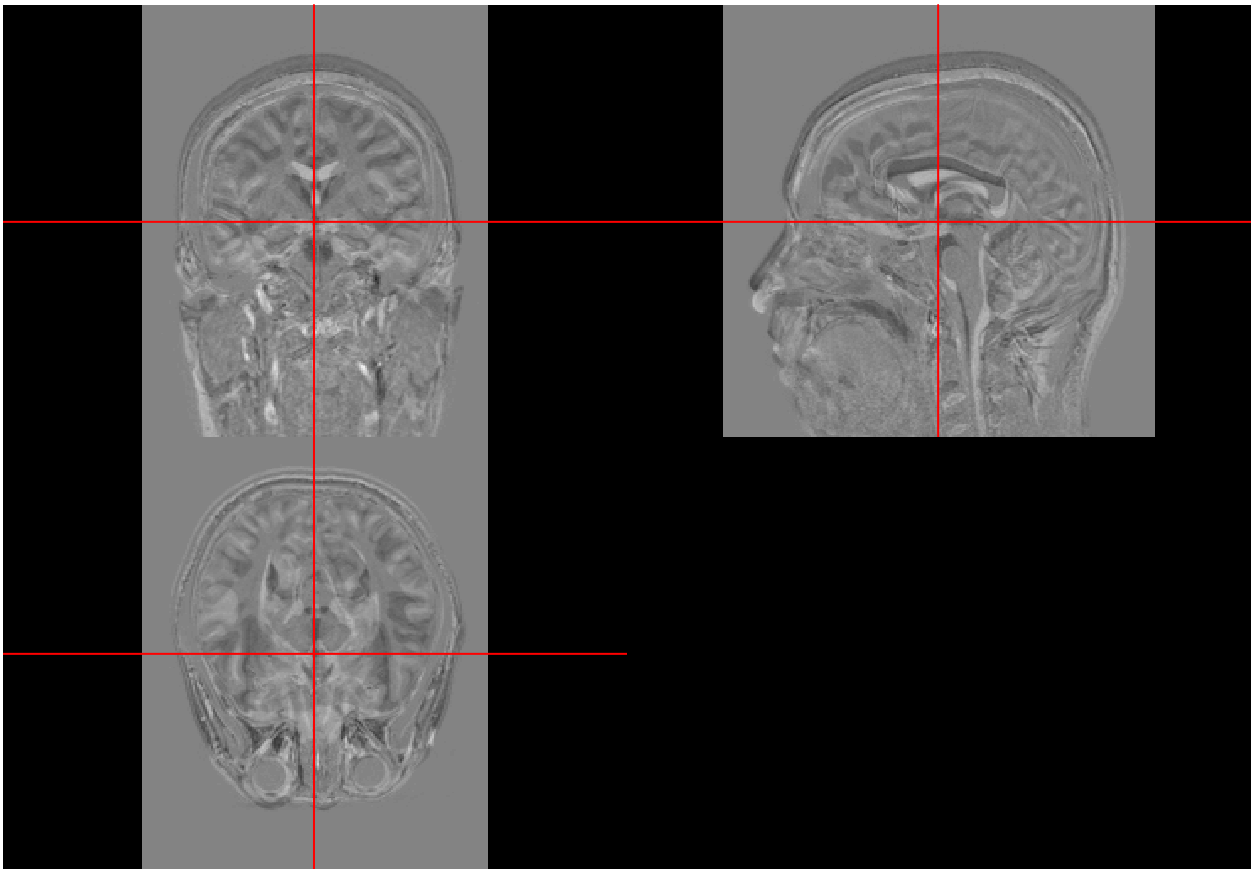
Visualizing orthographic T1*mask

```
library(fslr) # you may need install fslr

masked.T1 <- niftiarr(T1, T1*mask)

orthographic(masked.T1)
```



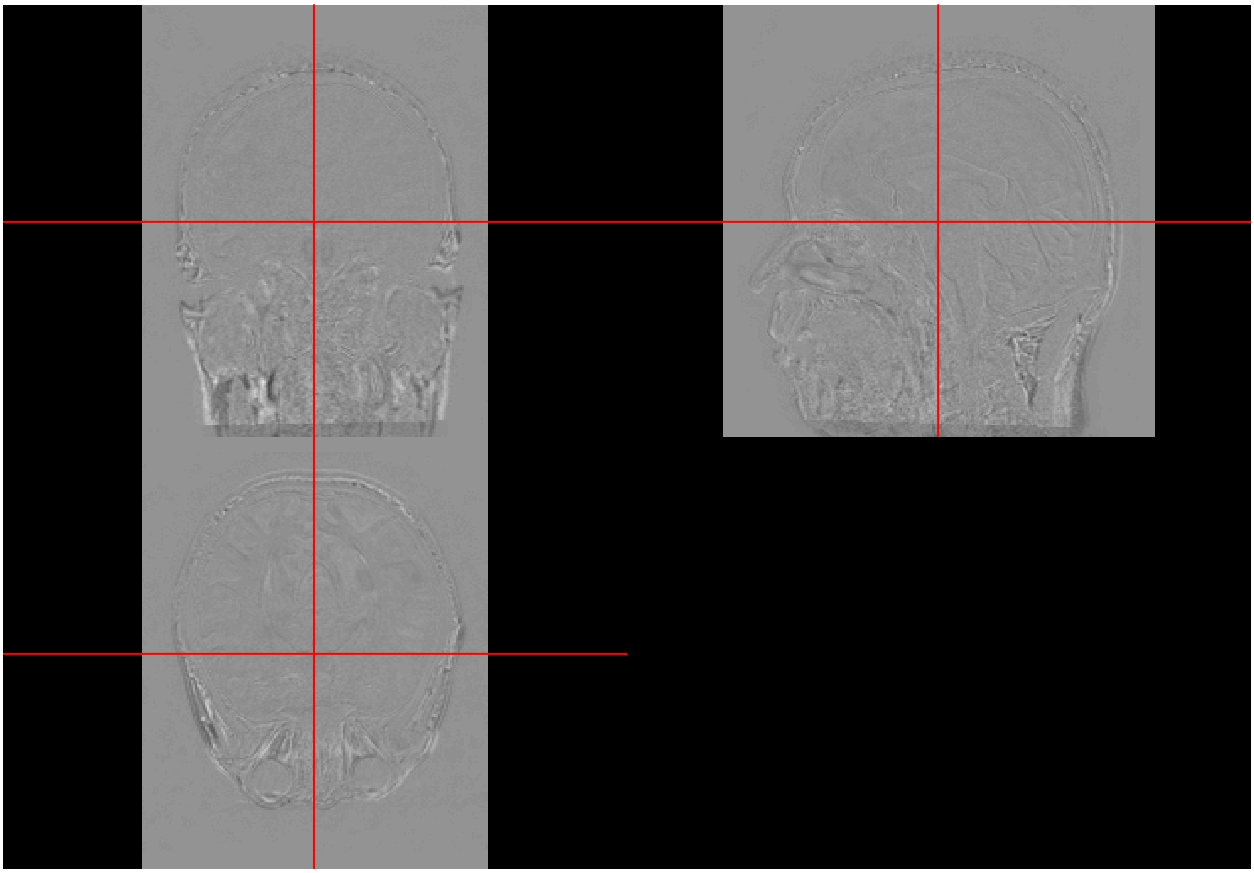
Visualizing orthographic subtract

```
library(fslr) # you may need install fslr


followurl <- "https://raw.githubusercontent.com/muschellij2/Neurohacking/master/Basic_Data_Manipulations
followdestfile <- "SUBJ0001-02-MPRAGE.nii.gz"
followfname <- file.path(getwd(), followdestfile)
download.file(followurl, followdestfile,mode="wb")

T1.follow <- readNIfTI(followfname, reorient=FALSE)

subtract.T1 <- niftiarr(T1, T1.follow - T1)
orthographic(subtract.T1)
```



Visualizing orthographic subtract process

```
library(fslr) # you may need install fslr


baseurl <- "https://raw.githubusercontent.com/muschellij2/Neurohacking/master/Basic_Data_Manipulations/
basefile <- "SUBJ0001-01-MPRAGE_N3.nii.gz"
basefname <- file.path(getwd(), basefile)
download.file(baseurl, basefile,mode="wb")



followurl <- "https://raw.githubusercontent.com/muschellij2/Neurohacking/master/Basic_Data_Manipulations
followfile <- "SUBJ0001-02-MPRAGE_N3_REG.nii.gz"
followfname <- file.path(getwd(), followfile)
download.file(followurl, followfile,mode="wb")


T1.base.process <- readNIfTI(basefname, reorient=FALSE)
T1.follow.process <- readNIfTI(followfname, reorient=FALSE)

subtract.T1.process <- niftiarr(T1, T1.follow.process - T1.base.process)
orthographic(subtract.T1.process)
```



Full genarated page can be found here http://rpubs.com/ngocbd/Basic-Data-Manipulation