

Makefile Documentation

Documenting makefiles: `Flex.mk`

Thu 2nd Jun, 2016

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1 This File

This documentation covers the following makefiles, and was prepared on Thu 2nd Jun, 2016 at 17:08 by tkmday

Flex.mk Identifies WM hyperintensities copied from act-plus PrepSubject.mk

Note that the items are sorted uppercase, then lowercase: [A-Za-z]

2 Targets

| Target | Definition & Description | File |
|--------|------------------------------|-------------------------|
| Flex | Identify wm hyperintensities | Flex.mk |

3 Variables

| Variable | Definition & Description | File |
|----------|--|-------------------------|
| FLEXPATH | \$(BIN)/wmprogram/sb/cross_platform/scripts where the flex scripts are stored | Flex.mk |
| SBBINDIR | \$(BIN)/wmprogram/sb/linux where the linux wrappers for the flex scripts are stored | Flex.mk |
| SCALE | 0.00266 scalar to adjust intensities, found through trial and error | Flex.mk |

4 Intermediate Files

`QA/images/checkflex.gif` ([Flex.mk](#)) check flex output - this is a quickie image for checking skull stripping and whether the hyperintensities seem at least to be in the right places

`flair/Flair_R0.nii.gz` ([Flex.mk](#)) reorient to standard

`flair/Flair_brain.hdr` (`Flex.mk`) skull-strip and export as ANALYZE filetype for the `sb_flex` script

`flair/Flair_brain_flwmt_lesions.hdr` (`Flex.mk`) identify wm lesions

`flair/Flair_restore.nii.gz` (`Flex.mk`) produce bias-field corrected image that is segmented

`flair/Flair_scaled.nii.gz` (`Flex.mk`) The default Flair image has crazy-high intensities that flex doesn't like, so we lower the intensities

`flair/Flair_wmh_mask.nii.gz` (`Flex.mk`) create mask of wm lesions

`flair/wmhstats.csv` (`Flex.mk`) ??

5 Makefiles

5.1 Flex.mk

```

## Identifies WM hyperintensities
## copied from act-plus PrepSubject.mk

#! where the flex scripts are stored
FLEXPATH=$(BIN)/wmpprogram/sb/cross_platform/scripts

#! where the linux wrappers for the flex scripts are stored
SBBINDIR=$(BIN)/wmpprogram/sb/linux

#! scalar to adjust intensities, found through trial and error
SCALE=0.00266

.PHONY: Flex

## Identify wm hyperintensities
Flex: flair/Flair.nii.gz flair/Flair_scaled.nii.gz flair/Flair_R0.nii.gz flair/
    Flair_brain.hdr flair/Flair_brain_flwmt_lesions.hdr flair/Flair_wmh_mask.nii.gz
    QA/images/checkflex.gif

#> The default Flair image has crazy-high intensities that flex doesn't like,
#> so we lower the intensities
flair/Flair_scaled.nii.gz: flair/Flair.nii.gz
    cp $< $@ ;\
    fslmaths $@ -mul $(SCALE) $@ -odt float

#> reorient to standard
flair/Flair_R0.nii.gz: flair/Flair_scaled.nii.gz
    fslreorient2std $< $@

#> produce bias-field corrected image that is segmented
flair/Flair_restore.nii.gz: flair/Flair_R0.nii.gz
    fast -B -o flair/Flair -t 2 $<

#> skull-strip and export as ANALYZE filetype for the sb_flex script
flair/Flair_brain.hdr: flair/Flair_restore.nii.gz
    niftiname=$(basename $@).nii.gz ;\
    bet $< ${niftiname} -R ;\
    fslchfiletype ANALYZE ${niftiname} $@ ;\
    rm ${niftiname}

#> identify wm lesions
flair/Flair_brain_flwmt_lesions.hdr: flair/Flair_brain.hdr
    @echo "Flex processing " $< ;\
    export PATH=$(FLEXPATH):$(SBBINDIR):$$PATH ;\
    export SBBINDIR=$(SBBINDIR) ;\
    $(FLEXPATH)/sb_flex -fl $<

#> create mask of wm lesions
flair/Flair_wmh_mask.nii.gz: flair/Flair_brain_flwmt_lesions.hdr
    fslmaths $< -uthr 1 $@

#> check flex output - this is a quickie image for checking skull stripping

```

```

#> and whether the hyperintensities seem at least to be in the right places
QA/images/checkflex.gif: flair/Flair_brain.hdr flair/Flair_wmh_mask.nii.gz
    mkdir -p QA/images ;\
    pngname=$(basename $@).png ;\
    slicer flair/Flair_brain.hdr flair/Flair_wmh_mask.nii.gz -l "orange" -a $$
        {pngname} ;\
    convert $$ {pngname} $@ ;\
    rm $$ {pngname}

# we have to use backticks here because $() is interpreted to be a make command,
# not a command expansion of a shell command - we can use make::basename, but
# there is no make::fslstats
#> ??
flair/wmhstats.csv: flair/Flair_brain_flwmt_lesions.hdr flair/Flair_brain.hdr
#    @echo Writing wmhstats.csv
    tot=$(shell fslstats $(word 2,$^) -V | awk '{print $$2}') ;\
    wmh=$(shell fslstats $(word 1,$^) -u 2 -V | awk '{print $$2}') ;\
    per=`echo $$ {wmh} $$ {tot} | awk '{print ($$1/$$2)*100}'` ;\
    echo $(subject)", "  $$wmh", "  $$per > $@

```