GridCAT Mask Comparison

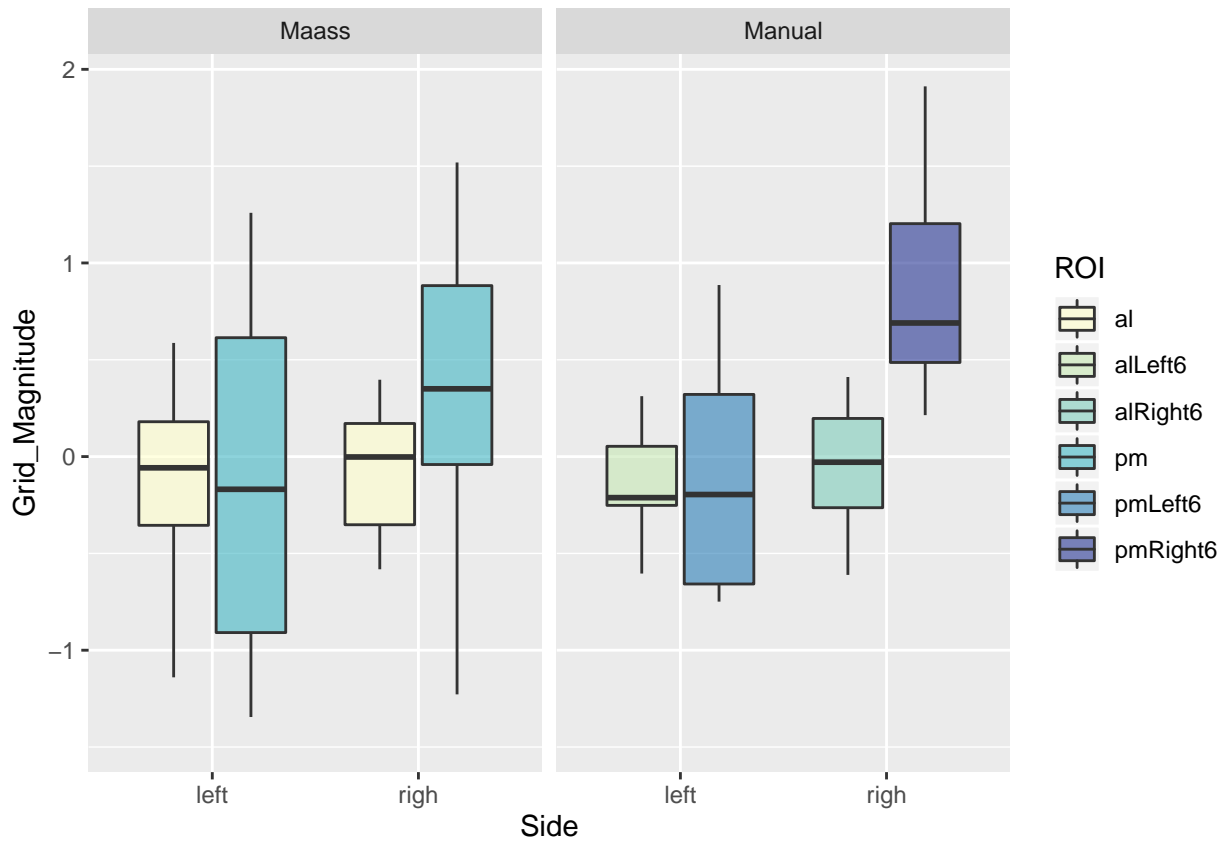C Newton

February 19, 2021

Pilot comparison

Plot grid cell magnitude per mask type

```
pd <- position_dodge(0.2)
gridmag.allruns <- gridmag %>% filter(Run %in% "allRuns")
ggplot(gridmag.allruns, aes(Side,Grid_Magnitude)) +
  geom_boxplot(aes(fill=ROI),outlier.shape = NA,alpha=0.6, show.legend = TRUE) +
  scale_fill_brewer(palette="YlGnBu") +
  facet_wrap(~Mask)
```

Explore tSNR

```
# make EC subdiv masks
pathstem=/lustre/scratch/wbic-beta/ccn30/ENCRYPT
MTLmaskdir=/home/ccn30/ENCRYPT/segmentation/ECsubdivisions_Mag
echo $MTLmaskdir

#mysubjs=${pathstem}/ENCRYPT_MasterRIScodes.txt
mysubjs=${pathstem}/testsubjcode.txt

## extract T2 pm/alEC masks
#for subjID in `cat $mysubjs`
#do
#subject="$(cut -d'/' -f1 <<<"$subjID")"
#echo "******** starting $subject ********"

## make hybrid al/pmEC masks in T2 space
#fslmaths ${MTLmaskdir}/"$subject"_right_lfseg_corr_usegray_ECsubdivisions.nii.gz -thr 16.5 -uthr 17.5
#fslmaths ${MTLmaskdir}/"$subject"_right_lfseg_corr_usegray_ECsubdivisions.nii.gz -thr 17.5 -uthr 18.5
#done

## call script to warp hybrid masks (as MTL) into EPI space and extract pm/alEC (currently only for Mag
#./coreg_MasksxSubjectSpace.sh

## make tSNR images for each subject
for subjID in `cat $mysubjs`
do
subject="$(cut -d'/' -f1 <<<"$subjID")"
echo "******** starting $subject ********"

# set paths to inputs
regDir=${pathstem}/registrations/"${subject}"
EPI=${pathstem}/fMRI/"${subject}"/rtopup_Run_1.nii
rightpmECT2xEPI=${regDir}/pmEC_right_Magdeburg_HybridMaskT2xEPI.nii
rightalECT2xEPI=${regDir}/alEC_right_Magdeburg_HybridMaskT2xEPI.nii
rightpmMaassxEPI=${regDir}/pmEC_right_MaassMaskxEPI.nii
rightalMaassxEPI=${regDir}/alEC_right_MaassMaskxEPI.nii

# make tSNR images
tSNRdir=${pathstem}/results/tSNR/"${subject}"
#mkdir -p $tSNRdir
EPI_mean=$tSNRdir/EPI_mean.nii
EPI_SD=$tSNRdir/EPI_SD.nii
EPI_tSNR=$tSNRdir/EPI_tSNR.nii
#fslmaths $EPI -Tmean $EPI_mean
#fslmaths $EPI -Tstd $EPI_SD
#fslmaths $EPI_mean -div $EPI_SD $EPI_tSNR

# extract pm/alEC values for different masks
pmECR_hybridMag_tSNR=$tSNRdir/tSNR_pmEC_right_hybridmaskMag.nii
alECR_hybridMag_tSNR=$tSNRdir/tSNR_alEC_right_hybridmaskMag.nii
pmECR_Maass_tSNR=$tSNRdir/tSNR_pmEC_right_Maassmask.nii
alECR_Maass_tSNR=$tSNRdir/tSNR_alEC_right_Maassmask.nii
```

```
#fslmaths $EPI_tSNR -mas $rightpmECT2xEPI $pmECR_hybridMag_tSNR
#fslmaths $EPI_tSNR -mas $rightalECT2xEPI $alECR_hybridMag_tSNR
#fslmaths $EPI_tSNR -mas $rightpmMaassxEPI $pmECR_Maass_tSNR
#fslmaths $EPI_tSNR -mas $rightalMaassxEPI $alECR_Maass_tSNR

# use subshell to output multiple fslstats commands per mask per subject into single output file, conve
#(fslstats $pmECR_hybridMag_tSNR -V -M -S -R | tr " " ",";fslstats $alECR_hybridMag_tSNR -V -M -S -R |
# did manual adjustments to csv file to add subjects and mask types, find way to automate
done
```

```
## /home/ccn30/ENCRYPT/segmentation/ECsubdivisions_Mag
## ******** starting 25773 ********
## ******** starting 25774 ********
## ******** starting 25739 ********
## ******** starting 27137 ********
## ******** starting 26795 ********
## ******** starting 26395 ********
## ******** starting 27241 ********
## ******** starting 27532 ********
```

Now read in tSNR_output.csv to visualise values

```
tSNR_in <- read_csv("/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv")
```

```
## Parsed with column specification:
## cols(
##   subject = col_double(),
##   subdivision = col_character(),
##   mask = col_character(),
##   nVoxels = col_double(),
##   Volume = col_double(),
##   mean_tSNR = col_double(),
##   sd_tSNR = col_double(),
##   min_tSNR = col_double(),
##   max_tSNR = col_double()
## )
```

```
## Warning: 20 parsing failures.
## row col  expected    actual                                                         file
##  17  -- 9 columns 7 columns '/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv'
##  18  -- 9 columns 7 columns '/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv'
##  19  -- 9 columns 7 columns '/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv'
##  20  -- 9 columns 7 columns '/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv'
##  21  -- 9 columns 7 columns '/lustre/scratch/wbic-beta/ccn30/ENCRYPT/results/tSNR/tSNR_output.csv'
## ... ... ......... ......... ..........................................................................
## See problems(...) for more details.
```

```
tSNR_in <- tSNR_in %>% modify_if(is.character,as.factor)
tSNR_in <- tSNR_in[-c(17:36),]

# plot mean tSNR
ggplot(tSNR_in, aes(mask,mean_tSNR)) +
  geom_boxplot(aes(fill=subdivision),outlier.shape = NA,alpha=0.6, show.legend = TRUE)
```
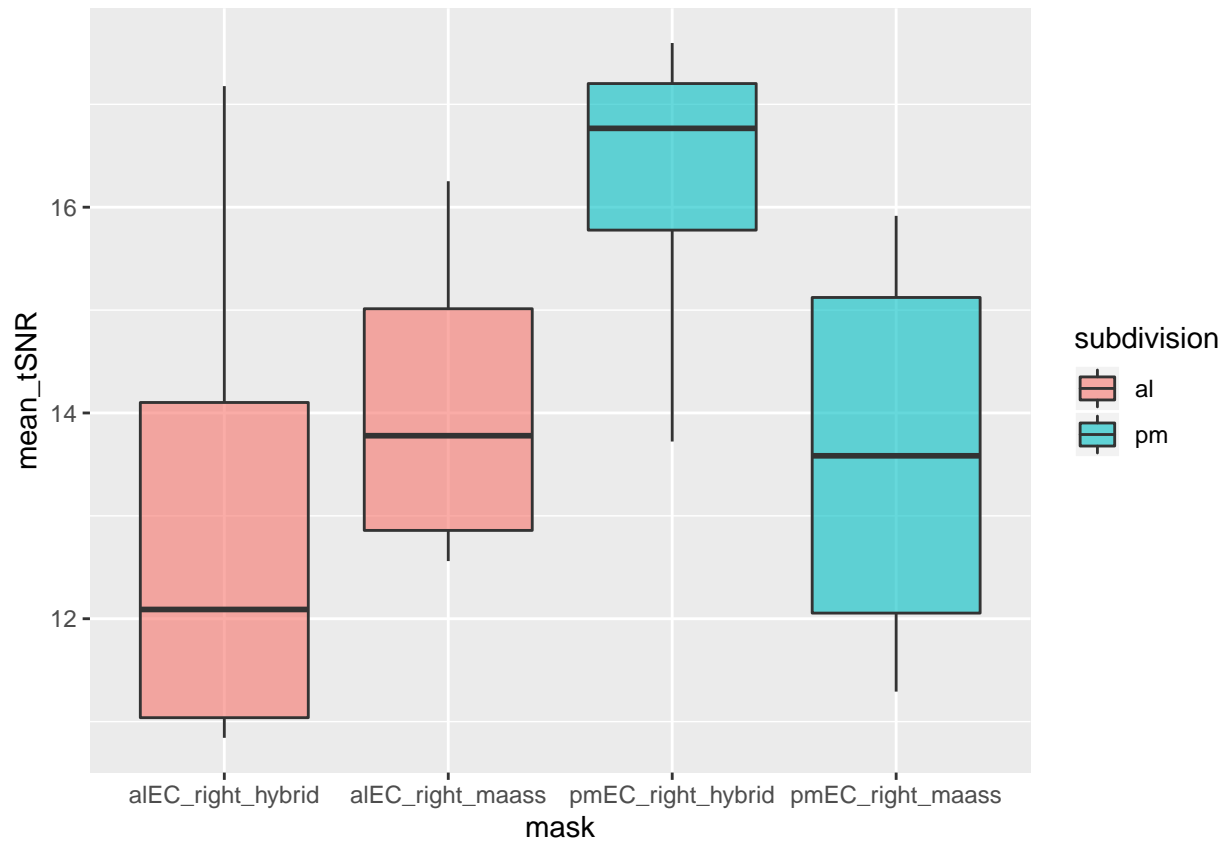
```r
# plot mean tSNR
ggplot(tSNR_in, aes(mask,Volume)) +
  geom_boxplot(aes(fill=subdivision),outlier.shape = NA,alpha=0.6, show.legend = TRUE) +
  geom_point(aes(group=subject),size=2,shape=21,position = pd)
```
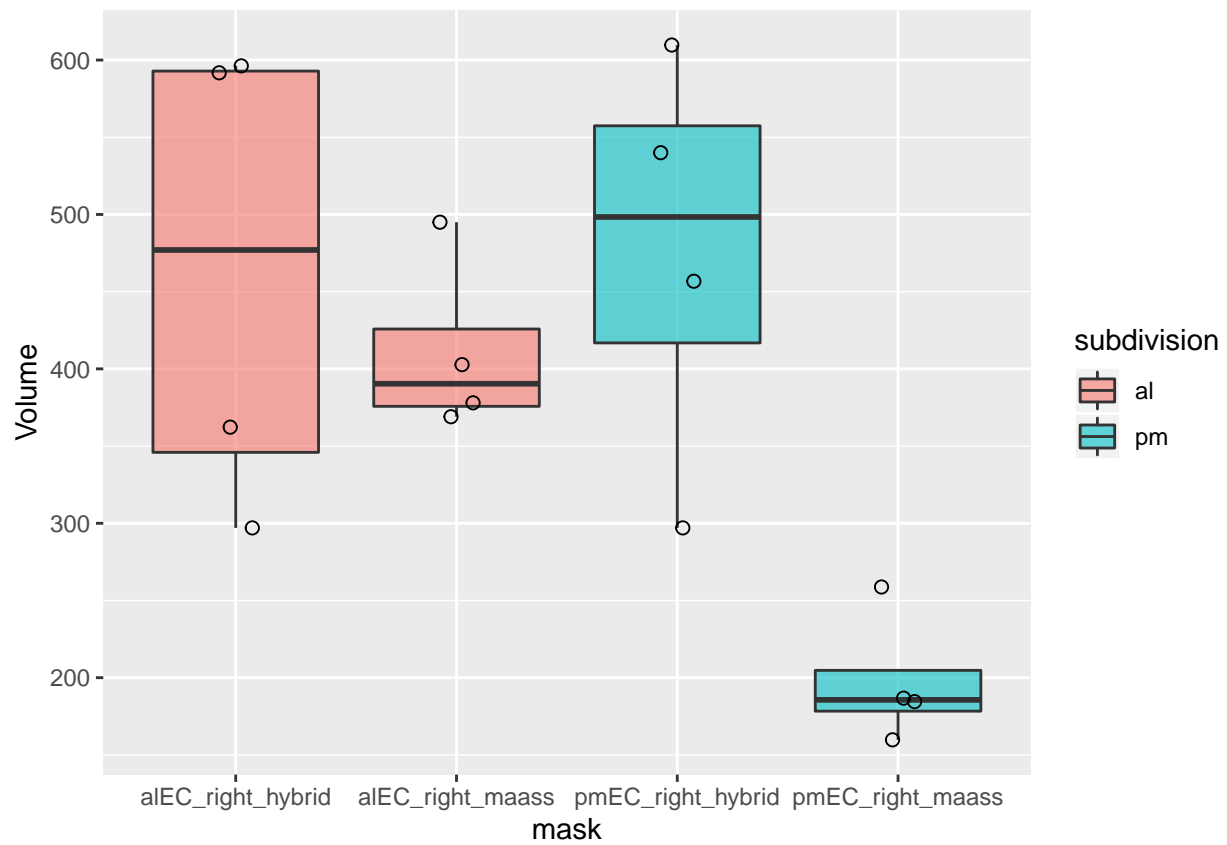
```
ggplot(tSNR_in, aes(mask,max_tSNR)) +
  geom_boxplot(aes(fill=subdivision),outlier.shape = NA,alpha=0.6, show.legend = TRUE) +
  geom_point(aes(group=subject),size=2,shape=21,position = pd)
```