

Self-Referential Processing in Neuronal Populations of Ventromedial and Orbitofrontal Cortex

```
% -*- UFT -*-
% Author: behira
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% loading the data
clc
clear
data = readtable('data\stimlock.tsv', FileType='text'); % reading that tabular data
```

Subject and Experimental Condition

```
% create report object
report = stat_report(data, 'data\BHV.json', 'data\FrontalEcogvsSeeg.json'); % stat_report insta
% print some info
Uniq_id = report.report("num_indiv");
```

The total number of pt is: 22

```
report.report("number_total_elec"); % statistical summary of number of electrodes
```

The total number of elec is: 253, in total patients 22
mean (std) # elec: 11.50(10.60), range = [1,38]

Behavioral Data

```
report.report("number_trials"); % statistical summary of number of trials per condition
```

EP # trails: mean (std): 24 (1.2)
SJ # trails: mean (std): 24 (1.9)
MTH # trails: mean (std): 39 (1.7)

```
report.report("number_true_false") % statistical summary of number of trials responded with tru
```

EP true # trails replied with true: mean (std): 9 (4), range = [4,22]
EP false # trails replied with true: mean (std): 15 (4), range = [4,21]
SJ true # trails replied with true: mean (std): 16 (3), range = [8,23]
SJ false # trails replied with true: mean (std): 8 (3), range = [3,14]
MTH true # trails replied with true: mean (std): 21 (4), range = [15,31]
MTH false # trails replied with true: mean (std): 16 (3), range = [9,20]
ans = struct with fields:

true: {[9 4 4 22] [16 3 8 23] [21 4 15 31]}

false: {[15 4 4 21] [8 3 3 14] [16 3 9 20]}

```
report.report("reaction_time") % statistical summary of RT responded with true and false
```

EP true RT replied with true: mean (std): 3.67 (1.40), range = [1.35,6.48]
EP false RT replied with true: mean (std): 3.62 (1.40), range = [1.38,6.45]
SJ true RT replied with true: mean (std): 3.06 (1.33), range = [0.96,5.49]
SJ false RT replied with true: mean (std): 3.56 (1.27), range = [1.16,5.86]

```

MTH true RT replied with true: mean (std): 4.65 (1.84), range = [1.22,8.32]
MTH false RT replied with true: mean (std): 5.37 (2.04), range = [1.34,9.47]
ans = struct with fields:
    true: {[3.6700 1.4000 1.3500 6.4800] [3.0600 1.3300 0.9600 5.4900] [4.6500 1.8400 1.2200 8.3200]}
    false: {[3.6200 1.4000 1.3800 6.4500] [3.5600 1.2700 1.1600 5.8600] [5.3700 2.0400 1.3400 9.4700]}

report.report("veridicality") % statistical summary of response veridicality.

```

```

EP true veridicality replied with true: mean (std): 0.47 (0.15), range = [0.24,0.82]
EP false veridicality replied with true: mean (std): 0.70 (0.21), range = [0.11,0.96]
MTH true veridicality replied with true: mean (std): 0.87 (0.11), range = [0.60,1.00]
MTH false veridicality replied with true: mean (std): 0.79 (0.20), range = [0.29,1.00]
ans = struct with fields:
    true: {[0.4700 0.1500 0.2400 0.8200] [0.8700 0.1100 0.6000 1]}
    false: {[0.7000 0.2100 0.1100 0.9600] [0.7900 0.2000 0.2900 1]}

```

Self-Referential Neuronal Population Activity in the OFC and vmPFC

```
report.report("ECoGSEEG") % statisitcal summary of number of ECoG and SEEG electrodes as well as
```

```

S01 -- electype: ECOG
S02 -- electype: ECOG
S03 -- electype: ECOG
S04 -- electype: ECOG
S05 -- electype: ECOG
S06 -- electype: ECOG
S07 -- electype: ECOG
S08 -- electype: ECOG
S09 -- electype: ECOG
S10 -- electype: ECOG
S11 -- electype: ECOG
S12 -- electype: ECOG
S13 -- electype: ECOG
S14 -- electype: ECOG
S15 -- electype: ECOG
S16 -- electype: ECOG
S17 -- electype: SEEG
S18 -- electype: ECOG
S19 -- electype: SEEG
S20 -- electype: ECOG
S21 -- electype: SEEG
S22 -- electype: SEEG
ECOG = 13 +/- 11, [2, 38]
OFC = 0.76 +/- 0.33
MPFC = 0.24 +/- 0.33
SEEG = 6 +/- 6, [1, 13]
OFC = 0.50 +/- 0.58
MPFC = 0.50 +/- 0.58

```

```

R = resultEEG(data, 'data\BHV.json', 'data\FrontalEcogvsSeeg.json'); % cerate an instance of
% define the colors for electrode activity in hex
col = ["#0065C1",... blue for self-referential
        "#A63838"]; % red for math
R.LocalizeSelfMath(col);

```

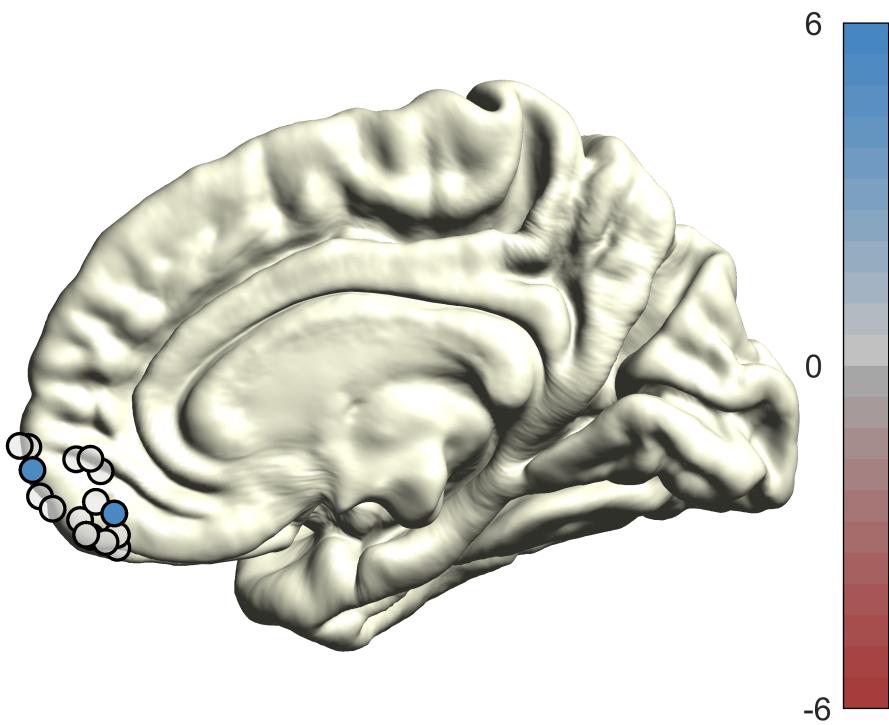
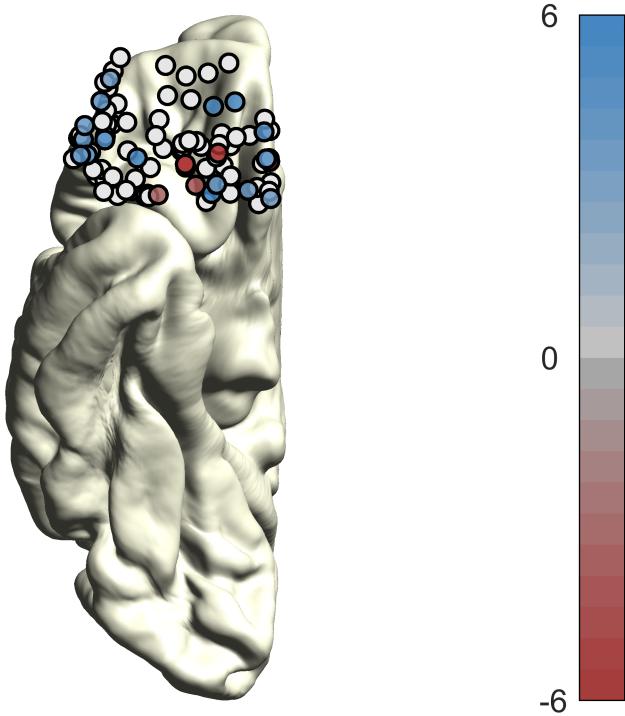
```

Warning: idxing stats at zero adding 1 to faces
observation 1 of 107
observation 2 of 107
observation 3 of 107
observation 4 of 107
observation 6 of 107

```

observation 7 of 107
observation 8 of 107
observation 14 of 107
observation 13 of 107
observation 12 of 107
observation 11 of 107
observation 10 of 107
observation 9 of 107
observation 59 of 107
observation 58 of 107
observation 57 of 107
observation 82 of 107
observation 81 of 107
observation 97 of 107
observation 105 of 107
observation 20 of 107
observation 19 of 107
observation 18 of 107
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observation 16 of 107
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observation 66 of 107
observation 90 of 107
observation 89 of 107
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observation 95 of 107

observation 104 of 107
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observation 100 of 107

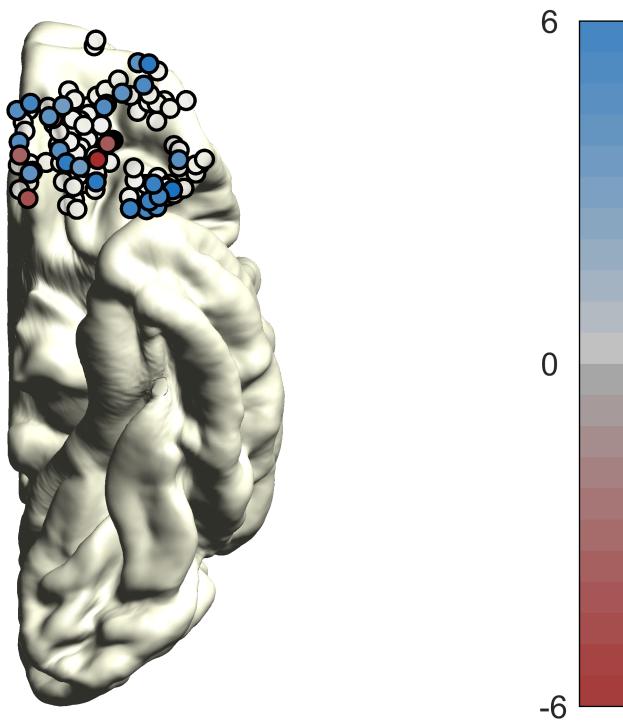


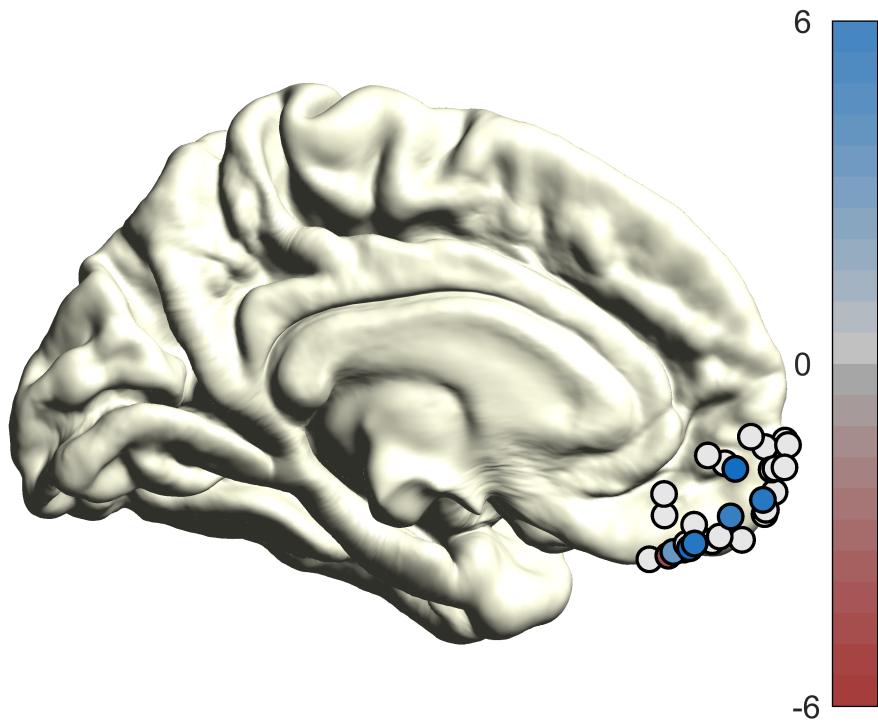
Warning: indexing stats at zero adding 1 to faces
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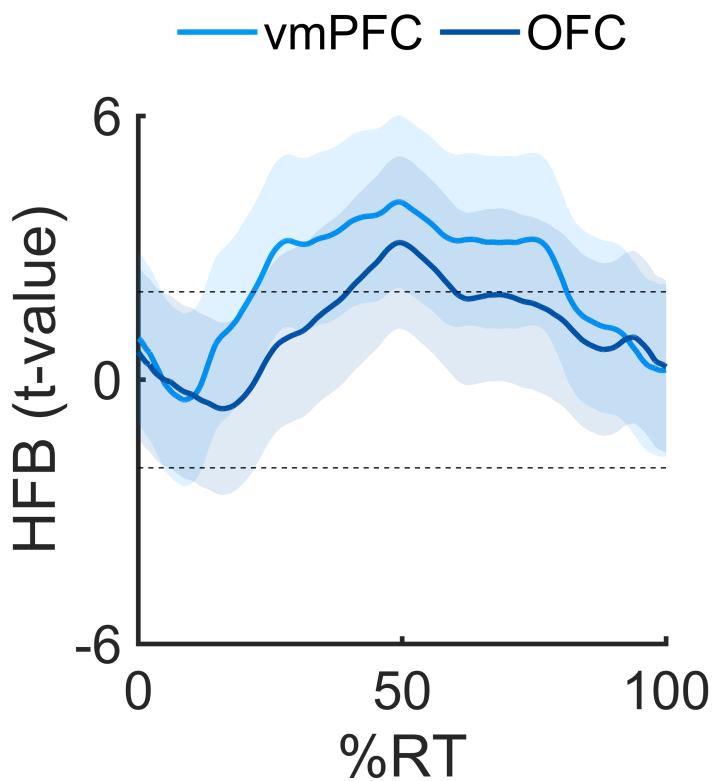
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observation 144 of 146





```
% read the time warped HFB envelope
HFB_tw.data = R.getTimeWarpedHFB('data\Stimlock-TimeWarped_ieeg.dat');
% read labels
HFB_tw.label = readtable('data\Stimlock-TimeWarped.tsv', FileType = 'text');
% trials were warped to 0:100% of RT
HFB_tw.time = (0:size(HFB_tw.data,2)-1)./512 - .5; % pre = 500ms, fsamp = 512
% define colors
col = ["#0097FB", "#0051A6"]; % light and dark blue
R.plot_HFB(HFB_tw, .1, col) % smoothing .1s
```



```
{
  "Anatomy": [
    "MPFC",
    "OFC"
  ],
  "time": [
    22,
    40
  ],
  "tvalue": [
    2.0582317462587456,
    2.0515793356025762
  ],
  "dof": [
    38,
    207
  ],
  "pvalue": [
    0.046473355236149594,
    0.041469574463316672
  ],
  "CI": [
    [
      -0.00061970406647421546,
      0.019372943035934495
    ],
    [
      0.00017573612611217551,
      0.017472824648551228
    ]
  ]
}
ans = 0
```

