README

Description of data for the current study:
Agam Y, Liu H, Pappanastassiou A, Buia C, Golby AJ, Madsen JR, Kreiman G. (2010). Robust selectivity to two-object images in human visual cortex. ***Current Biology,*** 20:872-879.
PDF
Supplementary material
Additional web figures

Data file
AgamEtAl2010_data.tar.gz [1.7 Gb]

```
gunzip AgamEtAl2010_data.tar.gz
tar -xvf AgamEtAl2010_data.tar

ls
subj1  subj2  subj3  subj4  subj5  subj6  subj7  subj8  subj9  % 9 subjects  (There is also subj10)

ls subj1/
session1     session2                                          % 2 sessions in subject 1

ls subj1/session1/
neural_data.mat           session_info.mat

session_info.mat    % contains information about the experimental session
neural_data.mat     % contains neural data

cd AgamEtAl2010_data/subj1/session1
load session_info.mat
block_struct         1x20             78224  struct
params               1x1              32822  struct
raw_image_list       1x25             3430  cell

raw_image_list   [1×25 cell array]
% List of images used in experiment (total of 25 images)
% E.g. raw_image_list{1}='animal_001.tif'

params    [struct with fields]
                  subject: 'm00016'     % ignore
                pres_time: 0.1000       % ignore
            image_interval: 1           % ignore
                  n_blocks: 20          % number of blocks in session
          n_images_in_block: 50         % number of trials per block
            percent_targets: 50         % percent of trials with target present
                   equalize: 1          % ignore
               image_folder: 'images'   % ignore
             send_triggers: 1           % ignore
    block_start_n_triggers: 5           % ignore
      block_end_n_triggers: 3           % ignore
          trigger_duration: 0.0150      % ignore
          trigger_interval: 0.1000      % ignore
             test_triggers: 0           % ignore
                  exit_key: 41          % ignore
          background_color: 128         % ignore
       pause_after_message: 1           % ignore
             fixation_size: 14          % ignore
           fixation_width: 2            % ignore
                categories: {'car'  'animal'  'house'  'chair'  'face'}
                                        % list of categories in experiment
    n_objects_per_category: 5           % number of exemplars in each category
                all_images: [875×2 double]
                 (yes_keys):            % Only for subjects 4-10. These vectors contain the keys used to perform the task. They
                 (no_keys):             are necessary in order to distinguish correct and incorrect ttrials.
```

Pay attention to the vector "categories": The order of categories, ie. the mapping category <—> numerical index is not fixed. At each session this was randomized. Example: in session1 category 1 could be 'car', in 'session2 category 1 could be 'animal'.

```
% internal code to describe which images are shown on the screen in each trial
% e.g. code 1 is [1 0]: that there was only one image, image 1
% e.g. code 300 is [2 25]: there were 2 images, image 2 and image 25
% linked to block_struct(block number).presentations
      all_image_categories: [875×2 double]
% same as previous variable but indicating which categories are shown on the screen in
each trial
% linked to block_struct(block number).presentations

block_struct [1×20 struct array with fields]   % 20 blocks
    target_index           % index for target category in each block
    target_category        % target category in each block
    presentations          % index of which images were shown in each (see below)
    score                  % scores, note only 10 blocks run in this session
    start_time             % start times, note only 10 blocks run in this session
    reaction_times         % reaction times in seconds
    end_time               % end times, note that 10 blocks run in this session
    responses              % responses of the patient for each trial (indicated with the key pressed) (valid only for subjects 4-10)
E.g. block_struct(1) [struct with fields]       % first block
       target_index: 1
    target_category: 'car'
      presentations: [50×1 double]
              score: 46
         start_time: '14:37:44'
     reaction_times: {1×50 cell}
           end_time: '14:38:42'

E.g. block_struct(1).presentations(1:5)         % first 5 trials of block 1
   410
   379
   614
   406
   868

params.all_images(block_struct(1).presentations(1),:)
7 10          % Images 7 and 10
raw_image_list(7)    {'car_002.tif'}
raw_image_list(10)   {'car_005.tif'}
params.all_image_categories(block_struct(1).presentations(1),:)
1 1           % Both images are from category 1
block_struct(1).reaction_times{1}
0.3439        % Subject responded in 0.3439 seconds indicating that the target
              category was present

params.all_images(block_struct(1).presentations(2),:)
6 4           % Images 6 and 4
raw_image_list(6)   {'car_001.tif'}
raw_image_list(4)   {'animal_004.tif'}
params.all_image_categories(block_struct(1).presentations(2),:)
1 2           % First image is from category 1, second image is from category 2
block_struct(1).reaction_times{2}
0.3362

params.all_images(block_struct(1).presentations(3),:)
15 14         % Images 15 and 14
raw_image_list(15)   {'chair_005.tif'}
raw_image_list(14)   {'chair_004.tif'}
params.all_image_categories(block_struct(1).presentations(3),:)
4 4           % Both images are from category 4
```

```
block_struct(1).reaction_times{3}
[]          % Subject did not respond. The first 3 subjects were instructed
            to respond only when the target category was present. The subject
            correctly indicated that the target category was absent in this
            trial.
```

load neural_data.mat

```
filtered_data       80x190001            60800320  single
parameters            1x1                3978  struct
trial_data          500x4                16000  double
```

```
parameters
              subject: 16                 % Ignore
    trigger_threshold: 800                % Ignore
             channels: [1×80 double]      % 80 channels
             sessions: 1                  % session number
          ref_channel: 0                  % Ignore
          rereference: 1                  % Ignore
            overwrite: 1                  % Ignore
          filter_data: 1                  % Ignore
                  low: 100                % Ignore
             low_trig: 0                  % Ignore
                 high: 0.1000             % Ignore
            high_trig: 1                  % Ignore
                notch: 60                 % Ignore
         general_info: 1                  % Ignore
         trigger_info: 0                  % Ignore
       trig_pic_order: 0                  % Ignore
          output_file: 'preprocessed_data.mat'  % Ignore
      trigger_channel: 81                 % Ignore
```

```
filtered_data      80x190001            60800320  single
% Intracranial field potential recorded for each channel, in microvolts
% Each entry is one sample. See Sampling Rates table for sampling rates
% E.g. subject 1, sampling rate = 256 Hz
% This session lasted 190001 samples / 256 samples/sec = 742.191 seconds

% Show intracranial field potential for channel 1 for the whole session:
t=1:190001;
sr=256;
t=t/sr;
plot(t,filtered_data(1,:));
xlabel('Time (secs)');
ylabel('Intracranial field potential (microvolts)');

trial_data      500x4              16000  double % 500 trials in this session
% column 1: trial number
% column 2: block number
% column 3: ignore
% column 4: trial start time (sample)

% Mark trial start times in plot
trial_start_times=trial_data(:,4);
trial_start_times=trial_start_times/sr;
```

```
hold on;
for i=1:500
      plot([trial_start_times(i,1),trial_start_times(i,1)],[-1000 1000],'k--
');
end
```

Sampling rates

Subject	Sampling rate (Hz)
1	256
2	256
3	500
4	256
5	256
6	500
7	500
8	256
9	256
10	500
