**README**

MAZE3\_preproc\_iEEG.m

%% resampling, filtering line noise

MAZE4\_detect\_SWR\_MGS.m

%% wrapper function to run ripple detection

detect\_SWR.m

%% modified from

% detect\_SWR\_events\_in\_hippocampus.m [Yitzhak Norman] and

% SWR detection algorithm.

% Detecting ripples after exclusion of electrical/muscular artifacts and interictal epileptic discharges (IEDs).

% The algorithm uses three main signals:

% (1) hippocampal (CA1/subiculum) ripple band (70-180 Hz)

% (2) common average of all iEEG cahnnels (filtered between 70-180 Hz for control detection)

% (3) hippocampal IED band (25-60 Hz)

ripples\_detection\_excluding\_IED.m

% Detecting ripples based on Stark et al. 2014 (Neuron) method.

% input:

% signal = normalized squared bandpassed LFP signal from the hippocampus

% (assuming sampling rate of 500Hz)

% BP = raw bandpass signal

% t = corresponding time in sec

% th = threshold in stdev [onset/offset peak]

% minDistance = in sec

% minRippleDuration = min ripple duration in Sec

% maxRippleDuration = max ripple duration in Sec

% noise\_ch = normalized squared bandpassed LFP signal from channels to exclude global artefacts identifed as rippples

% IED\_ch = normalized squared bandpassed LFP signal from channel to exclude IEDs that were identifed as rippples

% Fs = sampling rate

%

% output:

% ripples = output table with ripple-timing and other features (start,

% peak, end, amplitude, etc.)

% ripples\_stat = statistics of excluded events

%

% Author: Itzik Norman 15/12/17

MAZE6\_ER\_RippleRate\_psth.m

%% obtain event-related ripple rats using PSTH (centering bins around the

%% the event of interest)

MAZE7\_erRR\_traces.m

%% Calculate grand-average of ripple rates, shuffling procedure against a surrogate

MAZE9\_SpectralDecomposition.m

%% run spectral decomposition

MAZE11\_hpc\_mpfc\_master.m

%% This code examines OFC oscill power at the time SWR occurs in HPC.

%% by contrasting the SWR-locked LPF with non-SWR-locked LPF with matching time window size

% statistical approach:

% \*\* channel-level \*\*

% take OFC LFP +/= 200ms from HPC SWR peaks

% generate 401ms-long non-swr segments from task duration LFP

% random selection of non-swr segs, same # as swr segs

% generate channel-level t-maps for true and permuted data

% \*\* group-level \*\*

% run mixed-model regressions that

% 1) tests the t-value intercept

% 2) includes (chan|subj)

% on true t-maps and permuted t-maps

% Use regression results from permuted t-maps to determine

% statistically significant intercept and cluster size