

Software Notes

This paper will describe the software provided in the zip file named "STN_Borders_Refinement.zip".

The code is used in the article: "Real-time refinement of subthalamic nucleus targeting using Bayesian decision-making on the root mean square measure", published in Movement Disorders, 2006.

The zip file contains 3 Matlab files:

1) Stabtest.m

This function checks the stability of the signal. It uses ANOVA test on RMS values of windows on start and end of signal. Return value of 1 indicate stable signal, 0 for non-stable signal.

Input parameters:

sig - the analog signal, in microvolts.

len - the length of samples to check on both sides of the signal

win - the window size in samples. len should be multiples of win

alpha - the rejection limit

2) posterior.mat

This matlab file contains a structure named "posterior" which holds the posterior probabilities in the RMS-EDT domain. This structure should be one of the inputs to the main estimation function "estimLocRMS" which is described below

3) estimLocRMS.m

This is the main function that estimates the borders of the STN, based on the algorithm described in "Movement Disorders" article. The function returns the calculated estimated entrance and exit points of the STN, in mm from the center of the previously, imaging based estimated STN.

Input parameters:

EDT: An array of estimated distance to target values (depth). This should be in mm from the center of estimated STN

RMS: array of normalized RMS values, as described in the article

posterior: a structure containing the 3 2D posterior probabilities for each of the locations - pre, within and post STN, the one contains in posterior.mat file

printit: a flag indicating whether to print the graph of probabilities.

1 to print, 0 not to print.

Limitations:

This software is given freely without any responsibility to any use of it in any circumstances. Use of these functions to evaluate the STN position in an operation is the responsibility of the user.