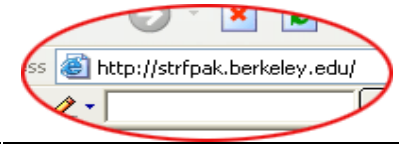
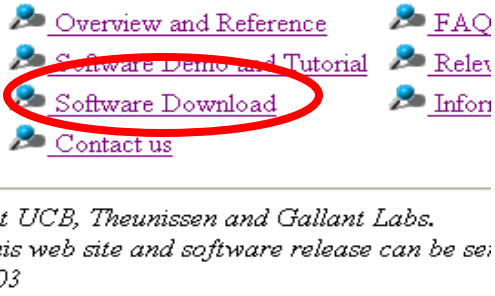
A Quick Guide to STRFPAK

Requirements

Since STRFPAK-1.0 is written in Matlab, it only runs on some operating systems (e.g Windows, Linux, MacOS and Unix). This version of STRFPAK also requires the following Matlab toolbox: Signal Processing, Statistics and Optimization toolboxes.

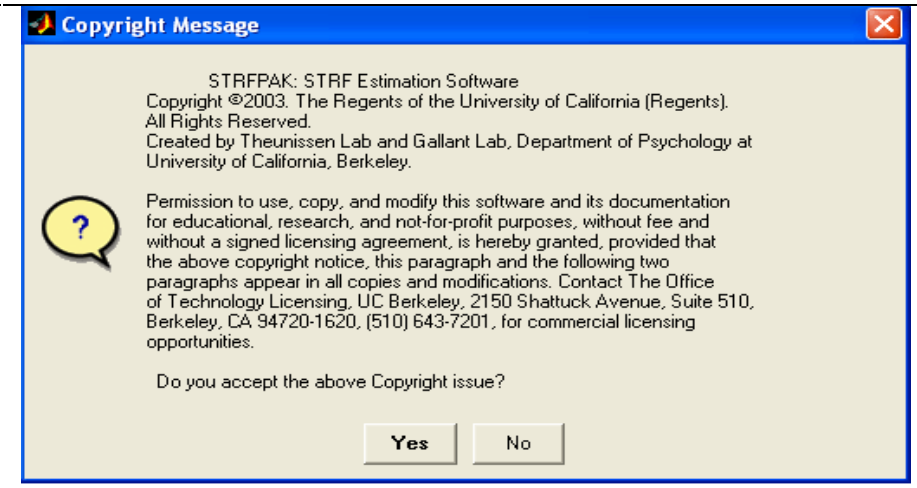
Downloading STRFPAK-1.0 Source Codes

1. Type the STRFPAK URL on your web browser and press enter:	http://strfpak.berkeley.edu 
2. Go to Download site and download:	http://strfpak.berkeley.edu/download.html 
3. Or get the STRFPAK-1.0 CD and copy the source code to your machine.	

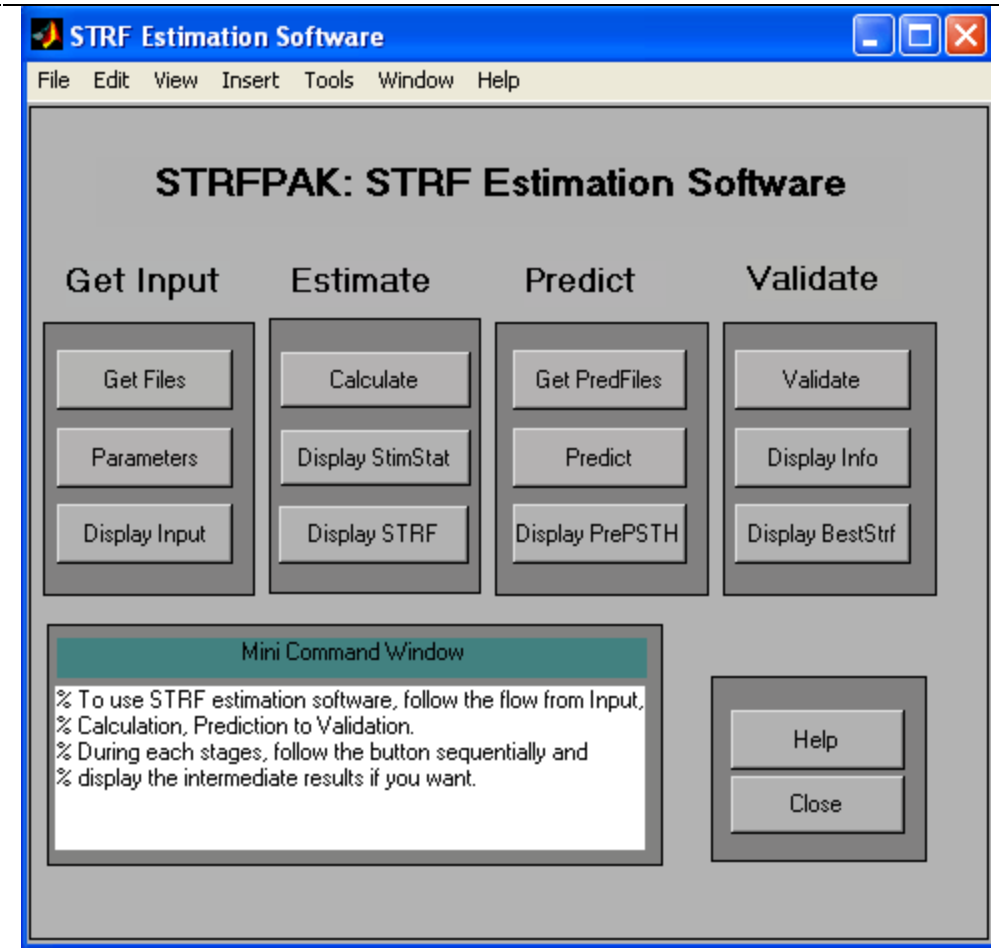
Starting Matlab

4. Click Matlab icon or start Matlab program	
5. Add the directory containing STRFPAK-1.0 source code to the Matlab working path or go to the STRFPAK-1.0 code directory:	>> addpath c:\STRFPAK-1.0

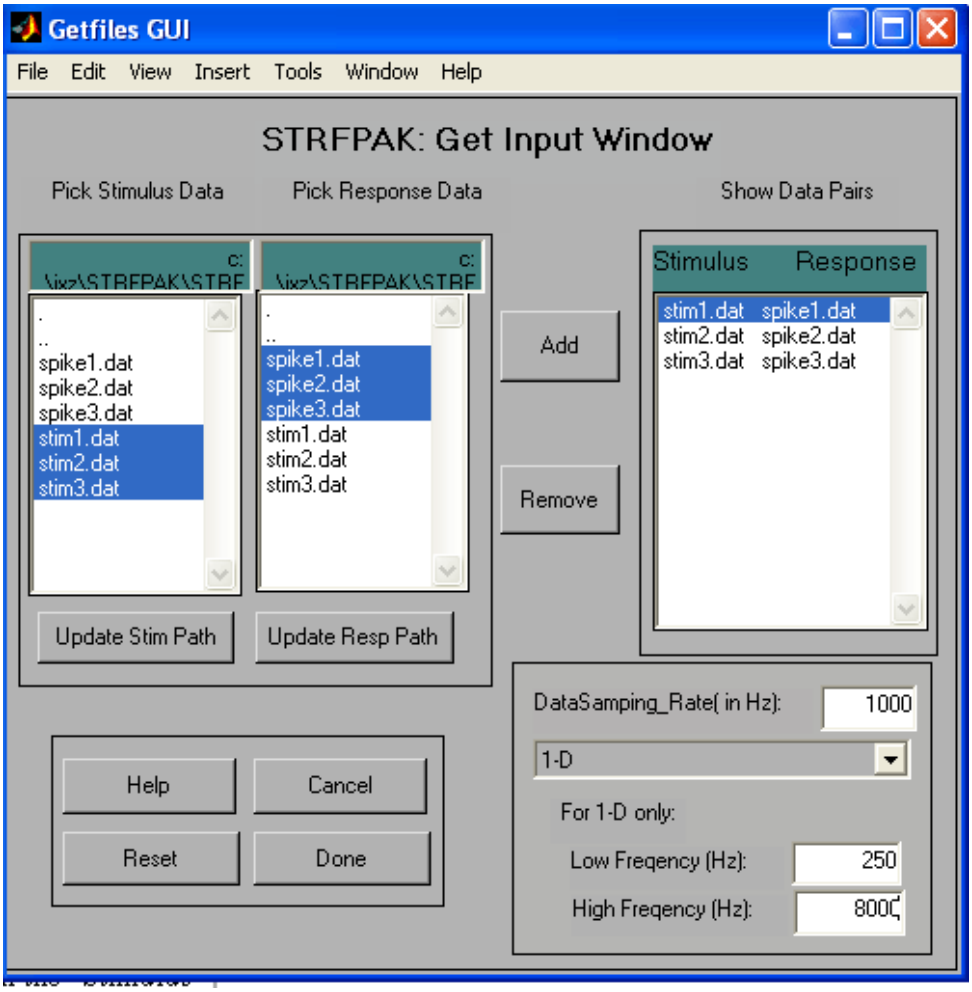
6. Type strfpak at the Matlab command line prompt and answer its copyright issue.



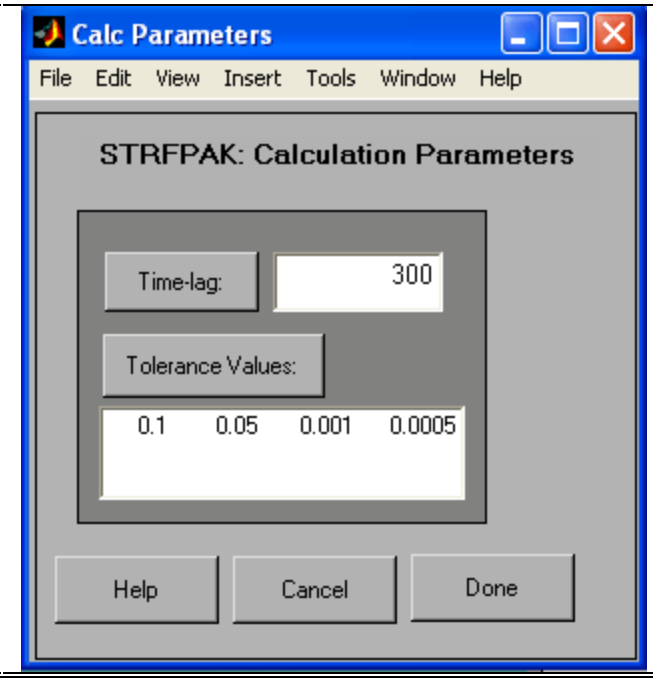
7. The STRFPAK main window shows STRFPAK's four main modules: handling input, calculation of the STRF, prediction and validation.



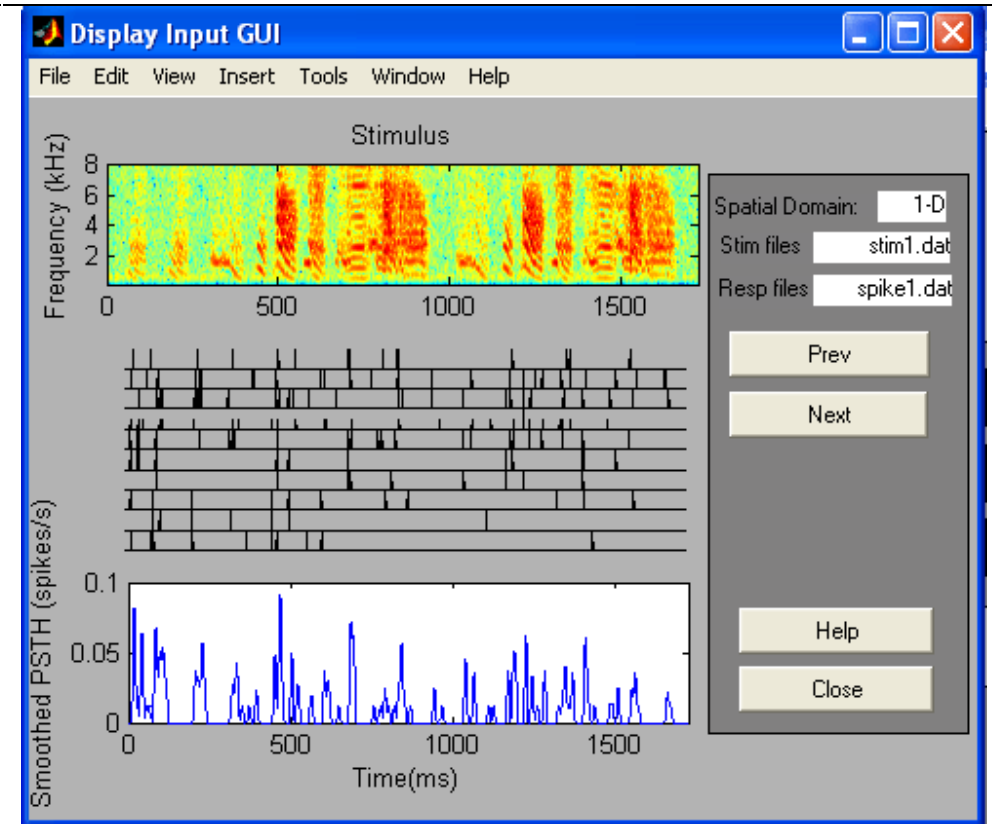
8. The GetFiles GUI Window: After clicking "Get Files", the "Get Files" window will prompt you to enter the data sets and parameters. Select data set(s) by clicking inside the “Pick Stimulus Data” file list and “Pick Response Data” file list, scrolling to see the selections and clicking on your choice. To select multiple data sets, hold down the CTRL key while clicking selections. You can review your selection in the "Stimulus Response" box. In this example, three data sets are selected: "stim1.dat and spike1.dat", "stim2.dat and spike2.dat" and "stim3.dat and spike3.dat". The stimulus and response amplitude sampling rate is 1000Hz. The spatial dimension refers to the temporal frequency domain, so this dimension is 1-D. The frequency range covers from 250Hz to 8000Hz.



9. The Calc Parameters window will prompt you to enter necessary parameters used in the software. TimeLag is the range of lags used for computing the auto/cross correlation (e.g. 300 ms). Tolerance value is a signal to noise threshold used in the STRF estimation. (e.g. 0.1, 0.05, 0.001, 0.0005).

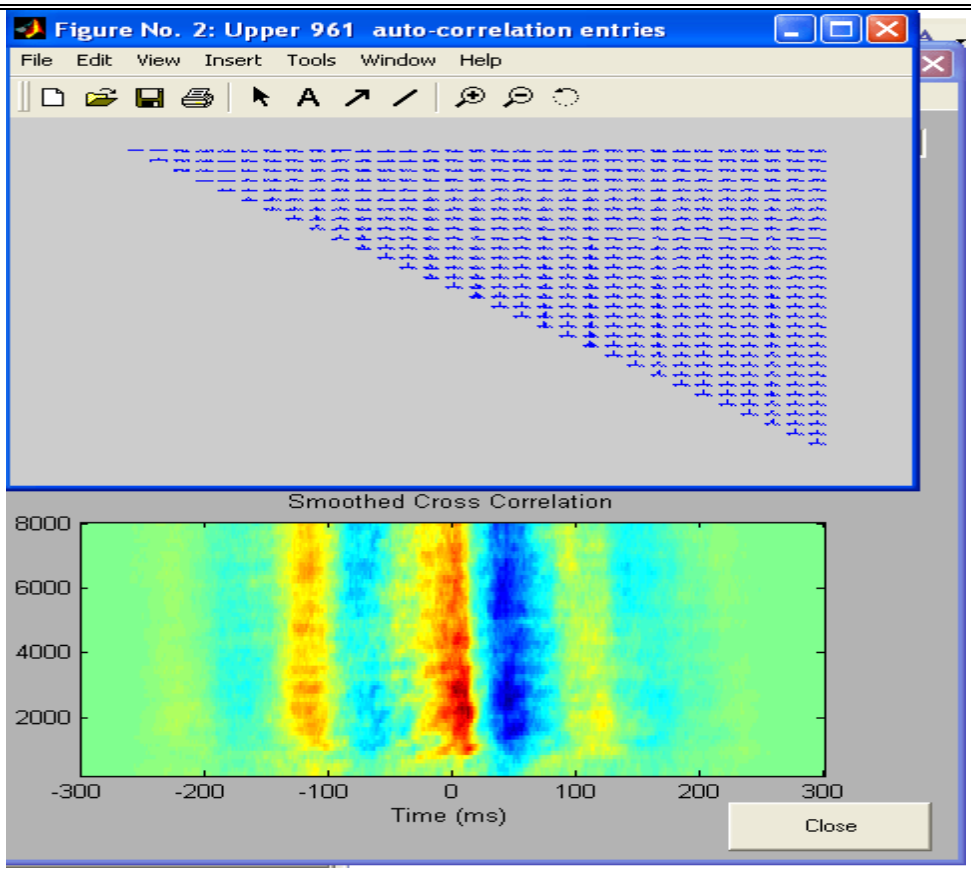


10. The Display Input GUI window will show three plots: stimulus in space-time domain; master plot of the spike trains and post-stimulus time histogram (PSTH).

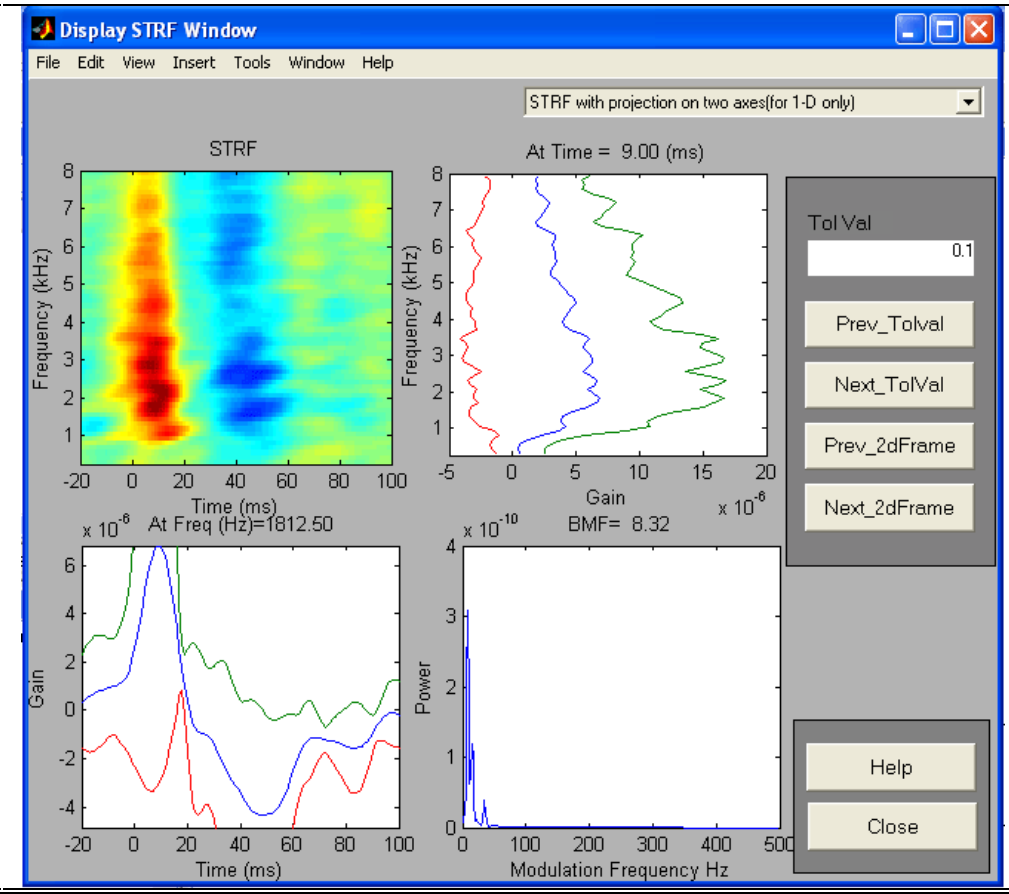


11. Click the Calculate button to use the generalized reverse correlation method to estimate the STRFs of sensory neurons based on input data.

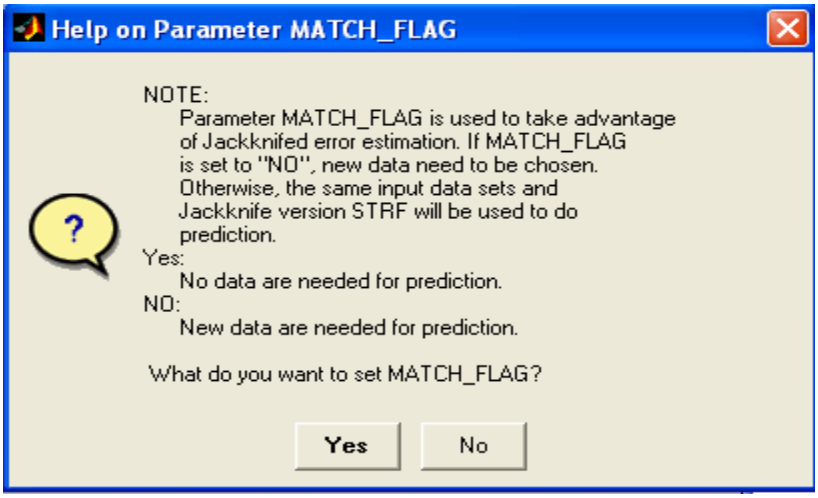
12. Display StimStat window: There are three options to display stimulus statistics: stimulus auto-correlation, stimulus-spike cross-correlation or 2-d display cross-correlation in a separate window.



13. Display STRF window: There are four options to display estimated STRFs: STRF only, the STRF with its projection on spatial and temporal axes, STRF with spike-triggered average (STA) and 2-D display STRF with STA in a separate window.

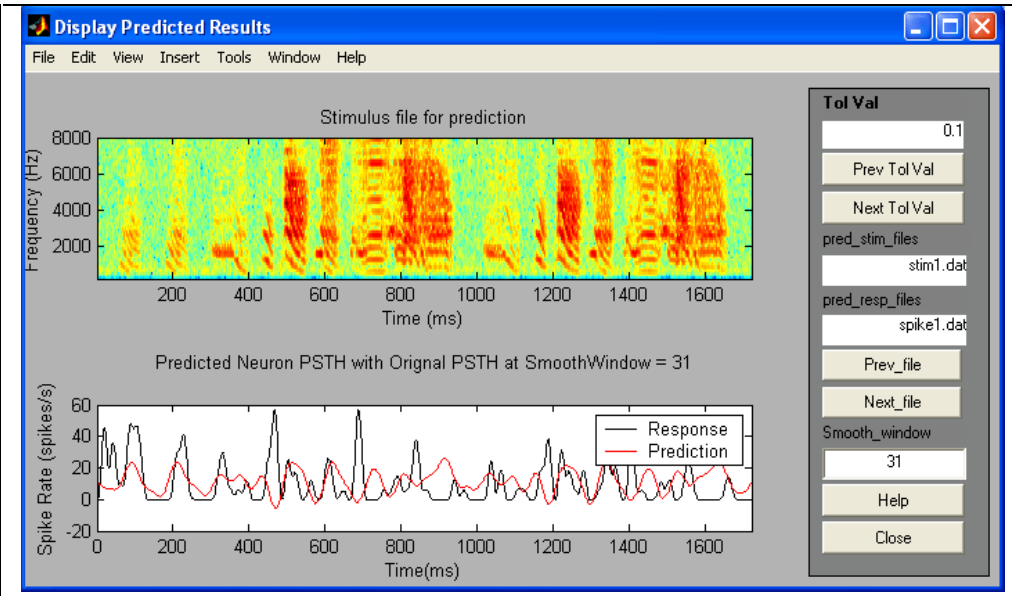


14. Get Predfiles window: Before the "Get PredFiles" graphic window pops up, you are asked if you want to set MATCH_FLAG parameter. It refers to whether the original data sets are used to do prediction. Even if the original data sets are chosen, the Jackknifed STRF will be used to prevent over-fitting. The layout of the "Get PredFiles" window is the same as the "Get Files" window.



15. Click Predict button to predict neuronal responses based on provided stimuli and estimated STRF.

16.The Display Predict Results window shows two panels. In the left panel, the first figure is the image of the stimulus file and the second figure gives the comparison of the predicted neuron response with the smoothed raw PSTH. The smoothed PSTH is obtained by first averaging the trials of the spike train and then smoothing it with the specified smooth-window.



17. Click the Validate button to validate the goodness of the fit by measuring the correlation coefficient.

18. Display Corr_Coeff/Info window displays the goodness of fit.