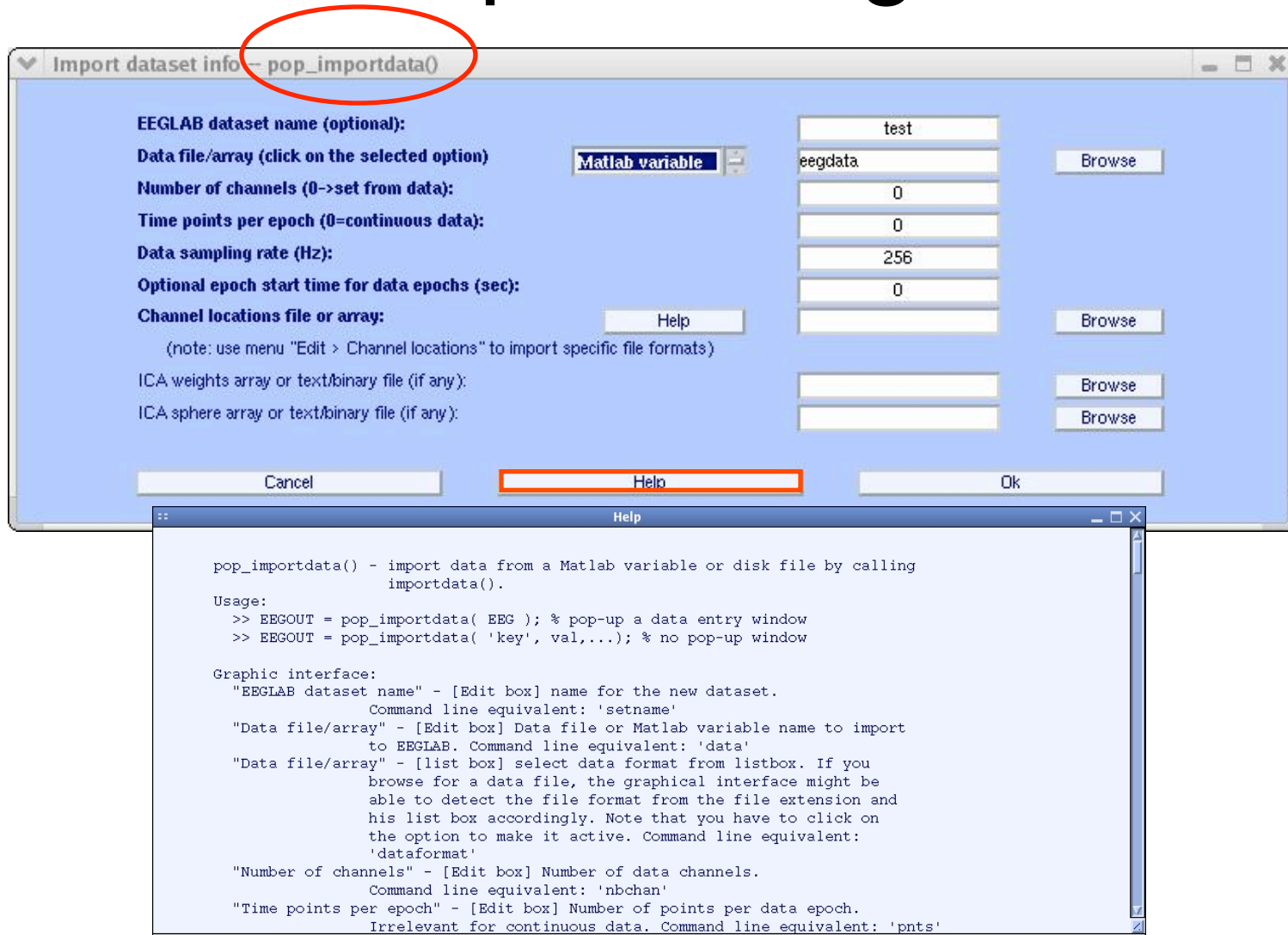


EEGLAB documentation

EEGLAB Home Page	http://sccn.ucsd.edu/eeglab/
EEGLAB Tutorial Index	http://sccn.ucsd.edu/wiki/EEGLAB
Workshop Home Page	http://sccn.ucsd.edu/eeglab/EEGLAB09ASPET

- 200 pages of tutorial (including “how to” for plugins) WEB or PDF
- Function documentation (next slide)
- Send questions to the mailing list eeglablist@sccn.ucsd.edu
(or search mailing list archive using google)
- Email us (bugs) eeglab@sccn.ucsd.edu
- Workshop with practicum every year

Help message

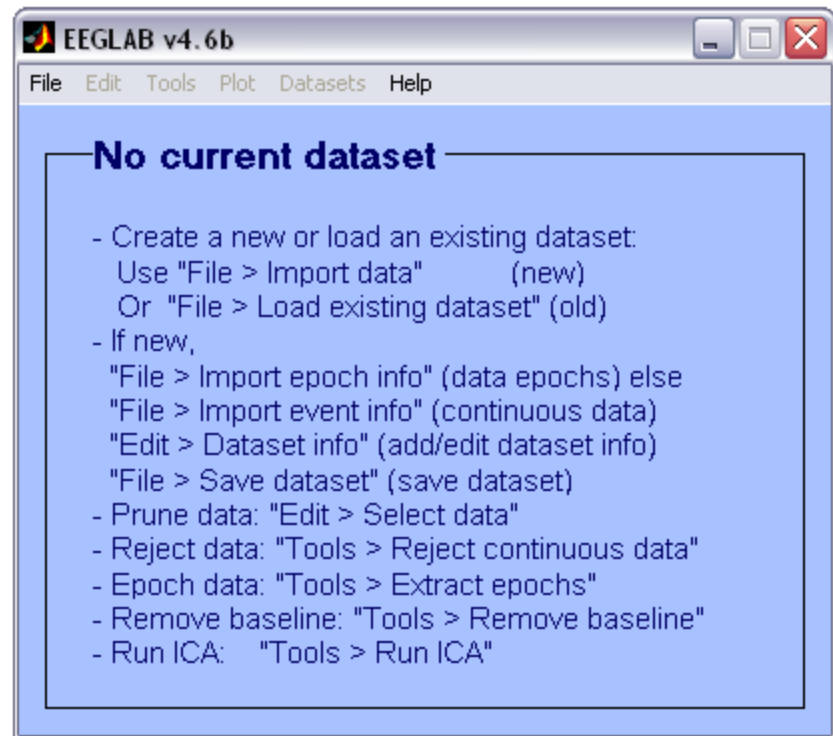


```
>> help pop_importdata()
```

EEGLAB Plugins

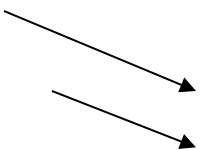
Starting EEGLAB

```
>> eeglab
eeglab: adding "BIOSIGv0.86" plugin
eeglab: adding "eepimport1.02" plugin (see >> help eegplugin_eepimport)
eeglab: adding "bva_io1.30" plugin (see >> help eegplugin_bva_io)
eeglab: adding "ctfimport1.01" plugin (see >> help eegplugin_ctfimport)
eeglab: adding "dipfit2.0" plugin (see >> help eegplugin_dipfit2_0)
eeglab: adding "fmrib1.2b" plugin (see >> help eegplugin_fmrib)
eeglab: adding "icaclust1.00" plugin (see >> help eegplugin_icaclust)
eeglab: adding "iirfilt1.0" plugin (see >> help eegplugin_iirfilt)
eeglab: adding "loreta1.0" plugin (see >> help eegplugin_loreta)
eeglab: adding "newtimefreq1.00" plugin (see >> help eegplugin_newtimefreq)
>>
```



EEGLAB plugins

eepimport1.02	Data importing for EEprobe data (Oostenveld & ANT company)
bva_io1.30	Brain vision analyzer import/export plugin (Widmann & Delorme)
ctfimport1.01	MEG CTF import plugin (Carver, Weber & Delorme)
dipfit2.0	4-shell and BEM (Oostenveld & Delorme)
fmrib1.2b	Removal of artifact from simultaneously EEG/fMRI recording (Niazi)
icaclust1.00	Clustering ICA components (Serby, Delorme, Makeig)
iirfilt1.0	Non-linear IIR filtering (Pozdin)
loreta1.0	Interface to LORETA-KEY (Delorme)
newtimefreq1.00	Time-freq. decomposition (Delorme)



**Better than FIR
Coregistration...**

Matlab toolboxes interfaced

BIOSIGv0.86	Data importing for rare data binary format (Schloegl)
Fieldtrip	Source localization and time-freq. decompositions (Oostenveld)
ICALAB	20 ICA algorithms (automatically detected by EEGLAB)
SPM2	Spatial normalization of anatomical MRI

Writing EEGLAB plugins

- Assuming that you have a signal processing function called xxxxx → Process any Input data Timef()
- a pop_xxxxx function will interface your signal processing function → Process EEG structure Pop_timef()
- a eegplugin_xxxxx function will add the menu to the main interface (and history etc...)

Pop functions

- Called with the EEG structure only pop_xxxx(EEG), they pop-up a GUI asking for more arguments
- Called with enough arguments, they simply call the signal processing function

```
function [EEG, com] = pop_sample( EEG, param1 );

com = ''; % empty history

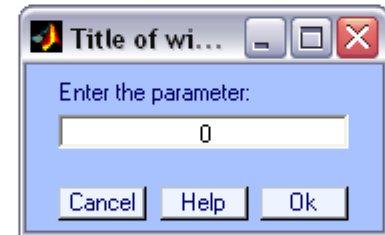
if nargin < 2
    % pop up window if less than 2 arguments
    promptstr = { 'Enter the parameter:' };
    inistr     = { '0' };
    result     = inputdlg( promptstr, 'Title of window', 1, inistr);
    if length( result ) == 0 return; end;

    param1 = eval( [ '[' result{1} ']' ] ); % the brackets allow to process matlab arrays
end;

sample( EEG.data, param1); % run sample function

com = sprintf('pop_sample( %s, %d );', param1); % return history

return;
```



eegplugin functions

- eegplugin_xxxx function

```
% eegplugin_erp() - plot ERP plugin
```

```
function eegplugin_erp( fig, try_strings, catch_strings);
```

```
% create menu
```

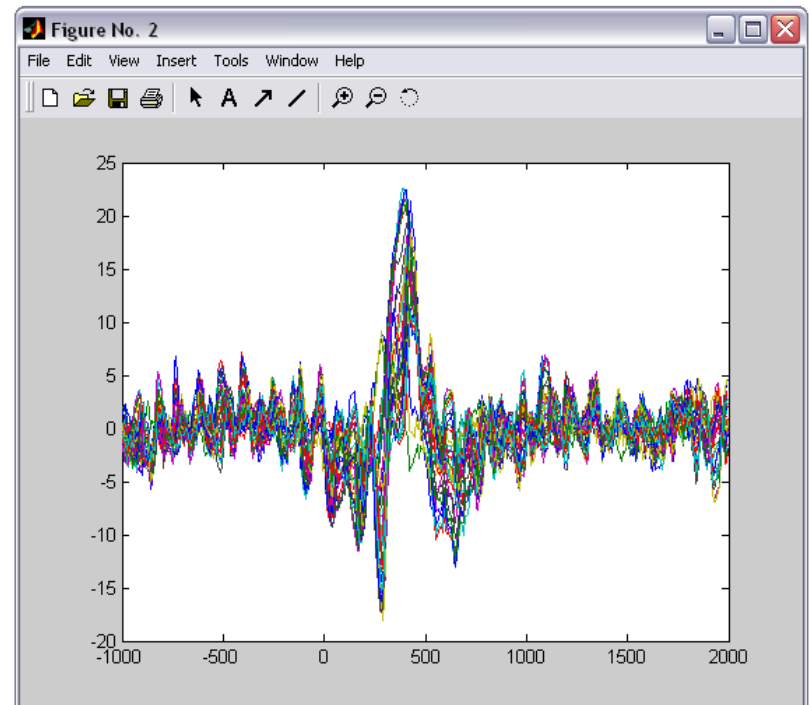
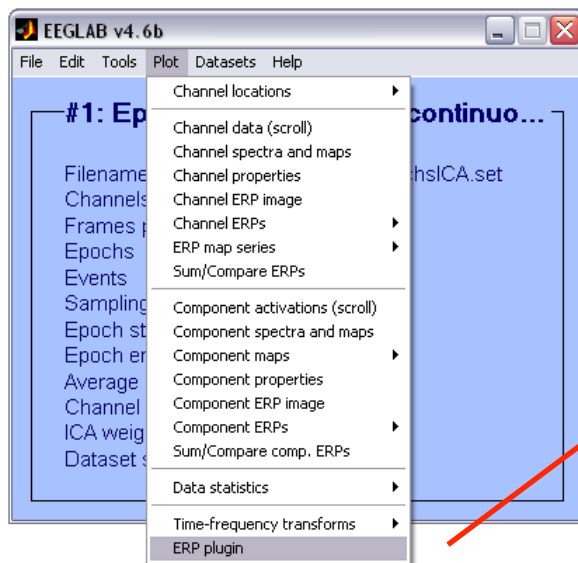
```
plotmenu = findobj(fig, 'tag', 'plot'); % find plot menu
```

```
% create submenu
```

```
uimenu( plotmenu, 'label', 'ERP plugin', ...  
        'callback', 'figure; plot(EEG.times, mean(EEG.data,3));');
```


eegplugin functions

```
>> eeglab
eeglab: adding "BIOSIGv0.86" plugin
eeglab: adding "eepimport1.02" plugin (see >> help eegplugin_eepimport)
eeglab: adding "bva_io1.30" plugin (see >> help eegplugin_bva_io)
eeglab: adding "ctfimport1.01" plugin (see >> help eegplugin_ctfimport)
eeglab: adding "dipfit2.0" plugin (see >> help eegplugin_dipfit2_0)
eeglab: adding plugin function "eegplugin_erp"
eeglab: adding "fmrib1.2b" plugin (see >> help eegplugin_fmrib)
eeglab: adding "icaclust1.00" plugin (see >> help eegplugin_icaclust)
eeglab: adding "iirfilt1.0" plugin (see >> help eegplugin_iirfilt)
eeglab: adding "loreta1.0" plugin (see >> help eegplugin_loreta)
eeglab: adding "newtimefreq1.00" plugin (see >> help eegplugin_ne
>>
```



PCA plugin

```
function vers = eegplugin_pca(fig, trystrs, catchstrs)
```

```
vers = 'pca1.00';  
if nargin < 3, error('eegplugin_pca requires 3 arguments'); end;
```

```
% add icaclust folder to path  
if ~exist('eegplugin_pca')  
    p = which('eegplugin_pca');  
    p = p(1:findstr(p,'eegplugin_pca.m')-1);  
    addpath( p );  
end;
```

```
% find tools menu  
menu = findobj(fig, 'tag', 'tools');
```

```
% PCA command  
cmd = [ '[tmp1 EEG.icawinv] = runpca(EEG.data(:,:));' ];  
cmd = [ cmd 'EEG.icaweights = pinv(EEG.icawinv);' ];  
cmd = [ cmd 'EEG.icasphere = eye(EEG.nbchan);' ];  
cmd = [ cmd 'clear tmp1;' ];
```

```
% create menu  
uimenu( menu, 'Label', 'Run PCA', 'CallBack', cmd, 'separator', 'on');
```

'import data' -> File > import data menu
'import epoch' -> File > import epoch menu
'import event' -> File > import event menu
'export' -> File > export
'tools' -> tools menu
'plot' -> plot menu

Exercise

Write a plugin to plot ERPs