

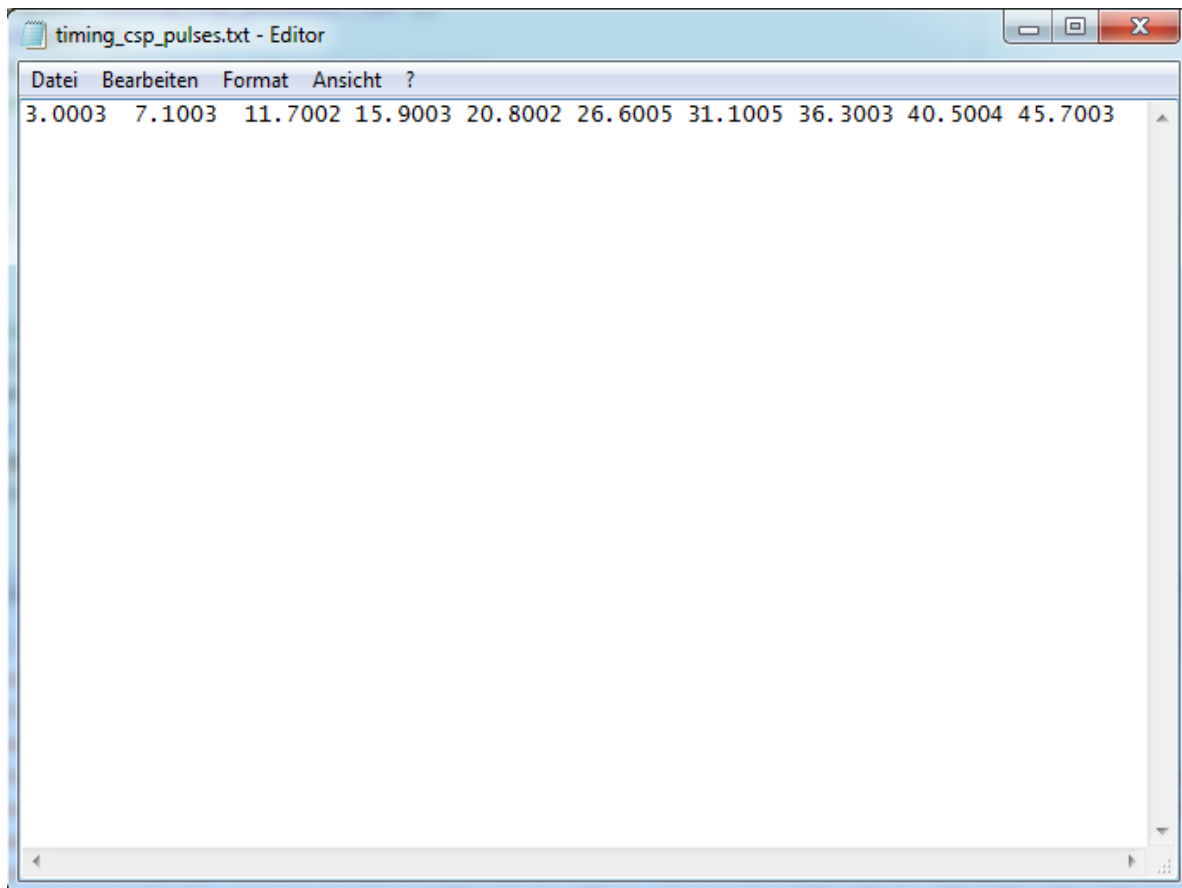
User Guide

cSPider 1.0 is free of charge, and can be used for various data formats (<http://pub.ist.ac.at/~schloegl/biosig/TESTED>).

Program details: Based on Matlab 2012b with installed Signal Processing Toolbox

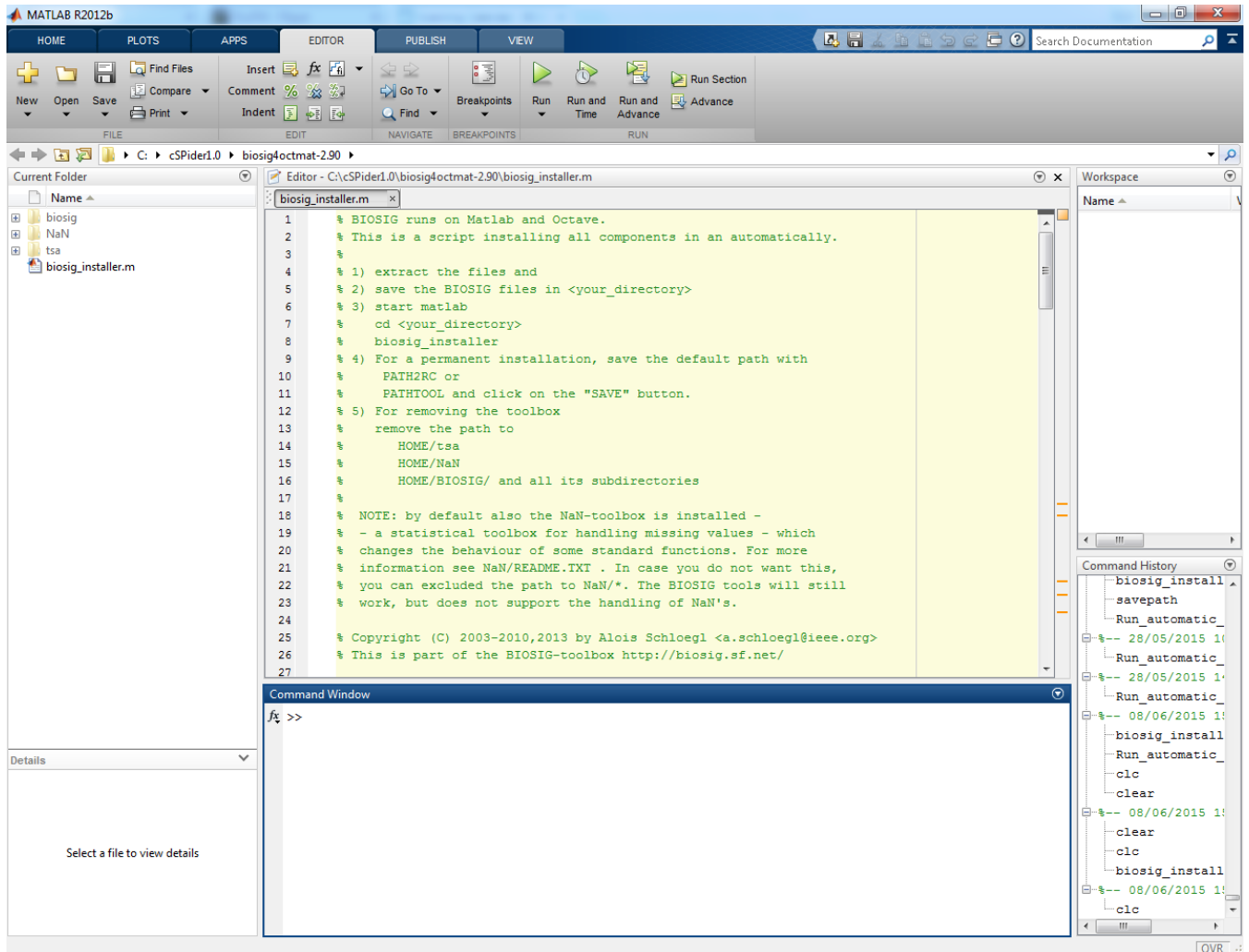
Folder Structure:

The “biosig4octmat-2.90”-folder and the scriptfiles are supposed to lay in the same folder as the datasets which are determined for analysis. Furthermore you have to prepare a txt.file called ‘timings_csp_pulses’ which contains the respective timings of your TMS pulses.



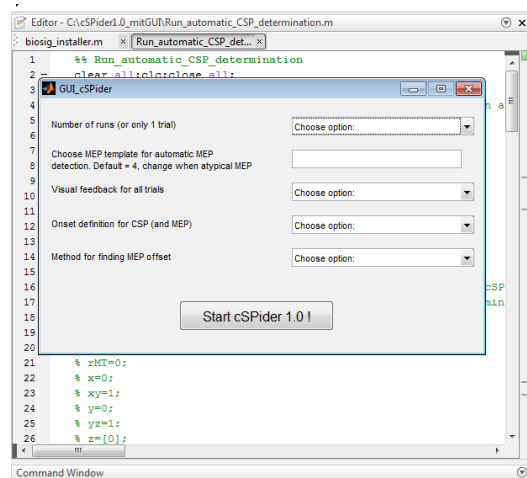
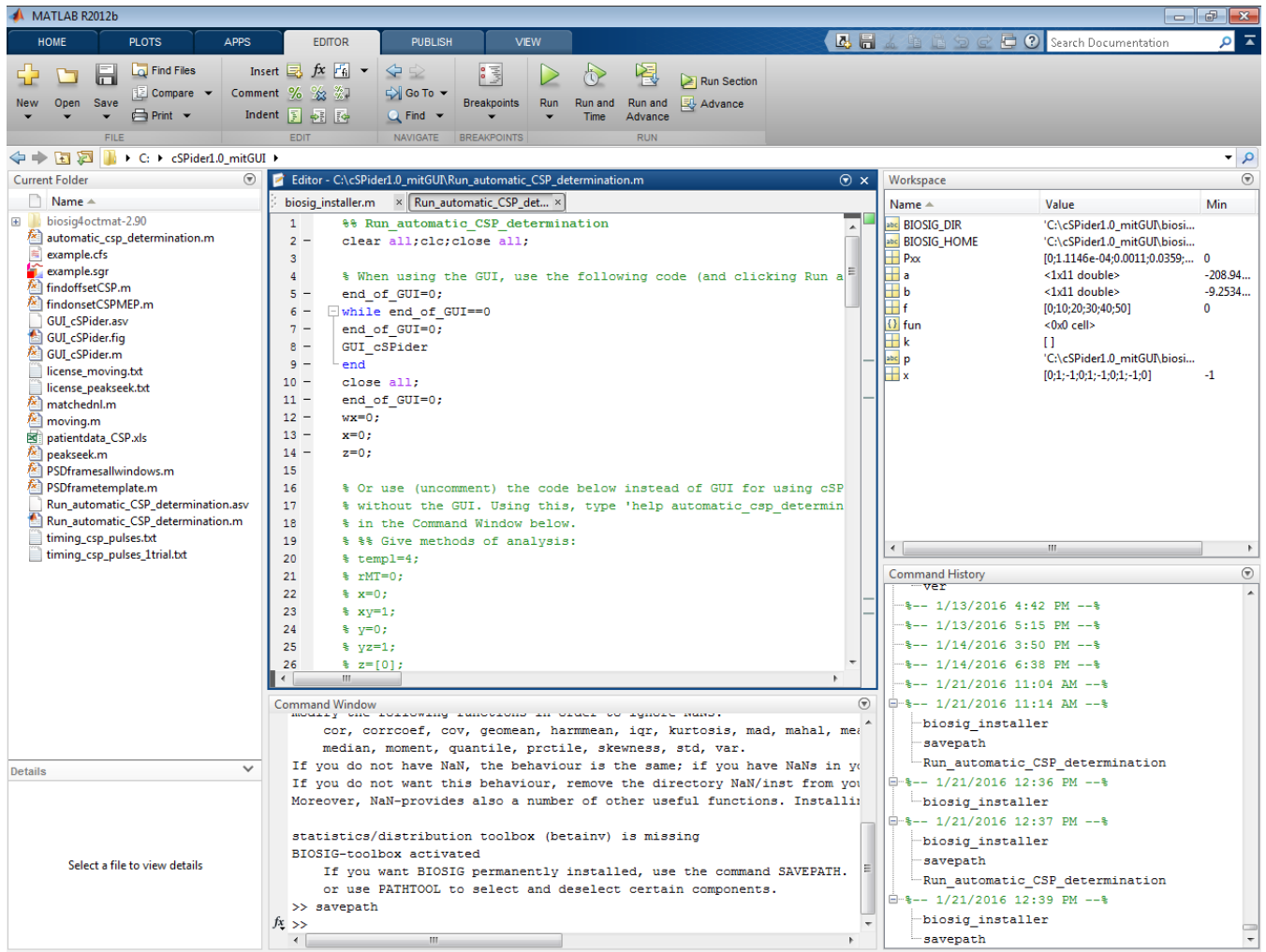
Step 1:

Open biosig_installer.m in Matlab and run it. Write “savepath” in the command window and press enter.



Step 2:

Open the scriptfile “Run_automatic_CSP_determination.m” and run it. Now, a GUI opens with the possibility to choose different options.



The following options are available and need to be considered:

Number of runs (or only 1 trial):

You can select whether your datafile consists of 4 runs with 10 trials each (=CSP) or only 1 run with 10 trials.

Choose MEP template for automatic MEP detection. Default = 4, change when atypical MEP:

Type in 4 if you want to use the default setting otherwise type in a number between and thus choose another MEP which serves as a sample for MEP detection.

Visual feedback for all trials:

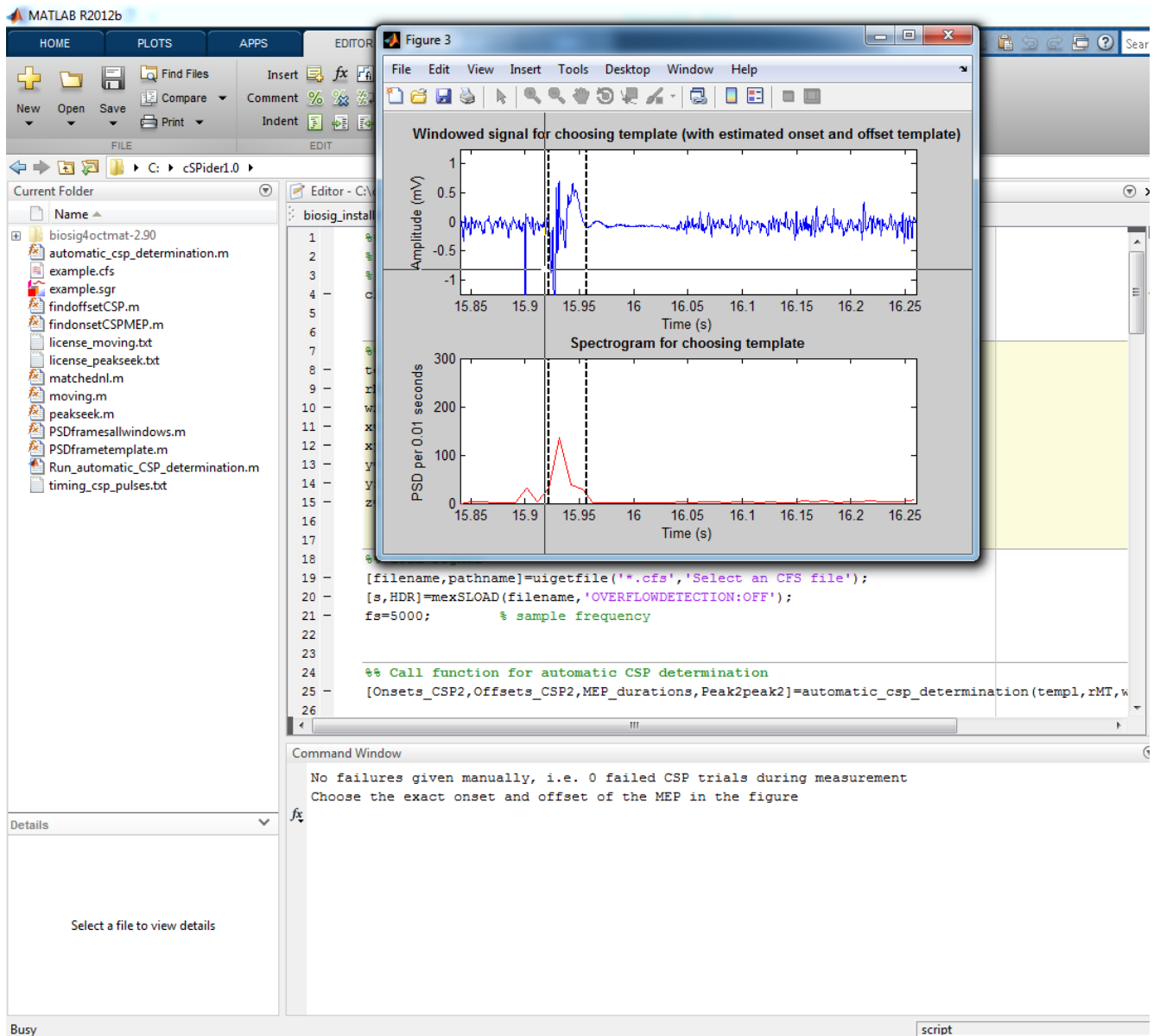
You can decide if you want to have visual feedback for all trials or not.

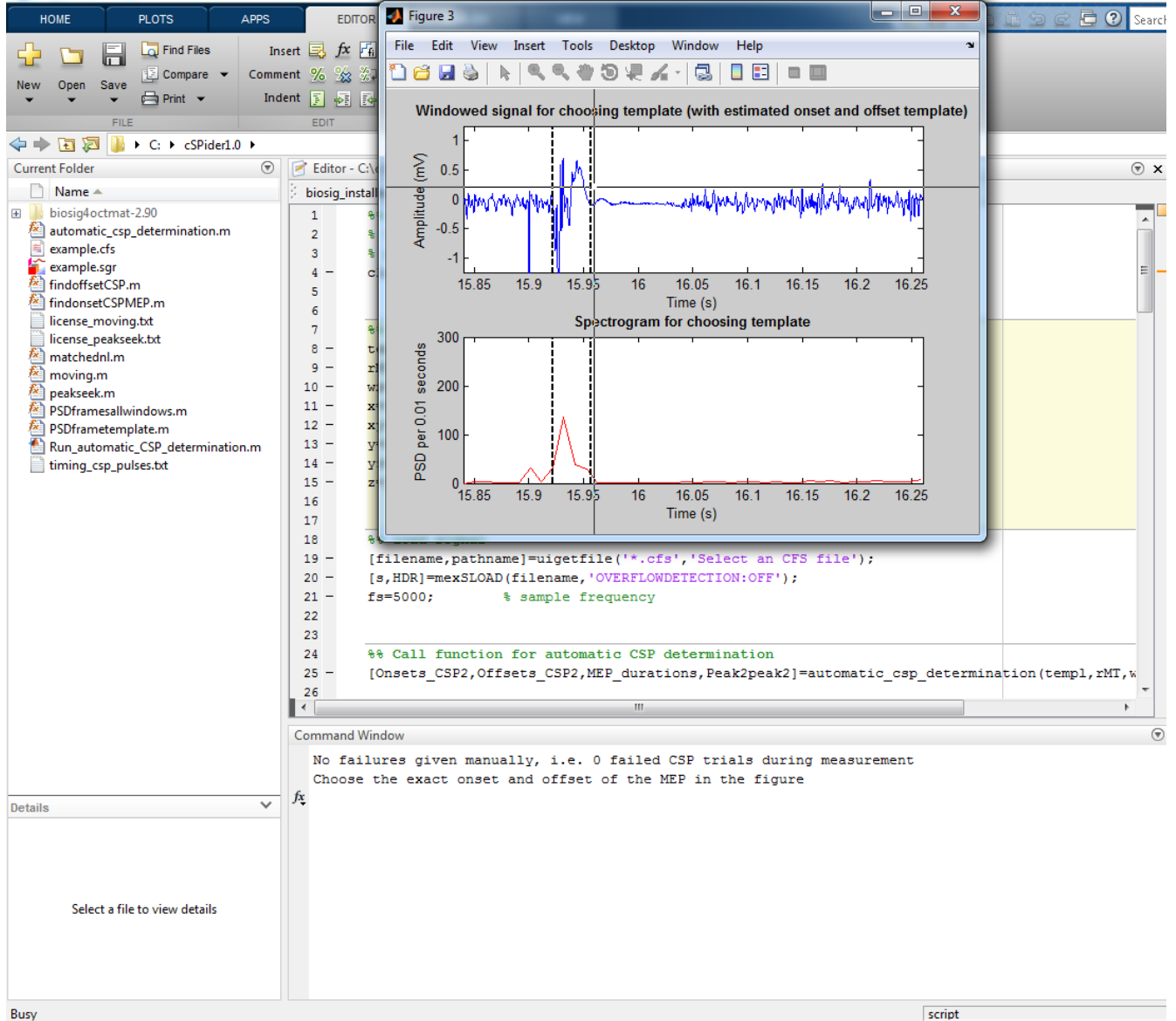
Method for finding MEP offset:

We recommend to choose the default option.

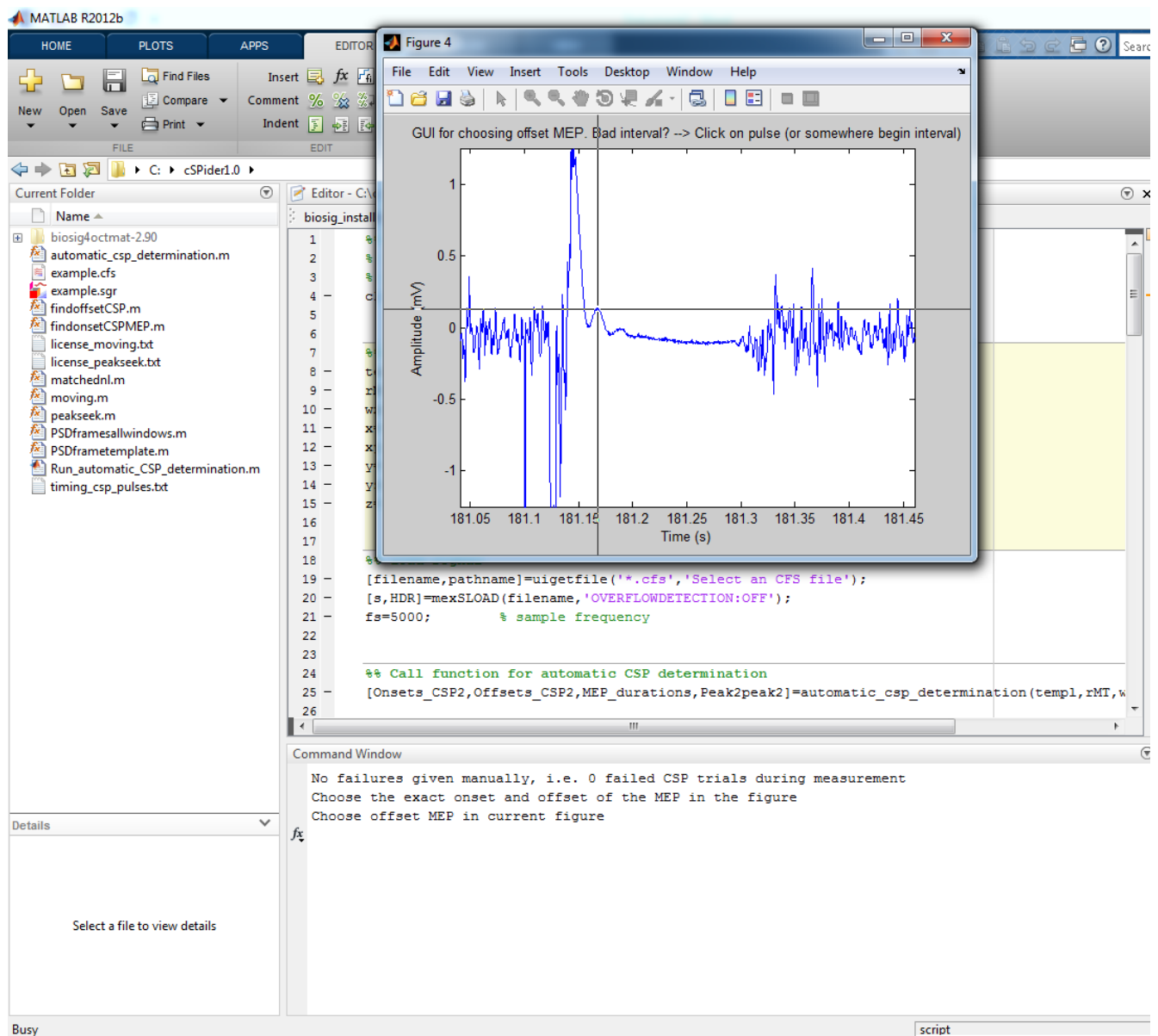
Click "Start cSPider 1.0 !". Select a datafile (.cfs) for analysis.

Step 3: A window for choosing onset and offset of an exemplary MEP opens. The dotted lines show a suggestion for MEP onset and offset. Click on dotted lines or choose other MEP onset and offset.

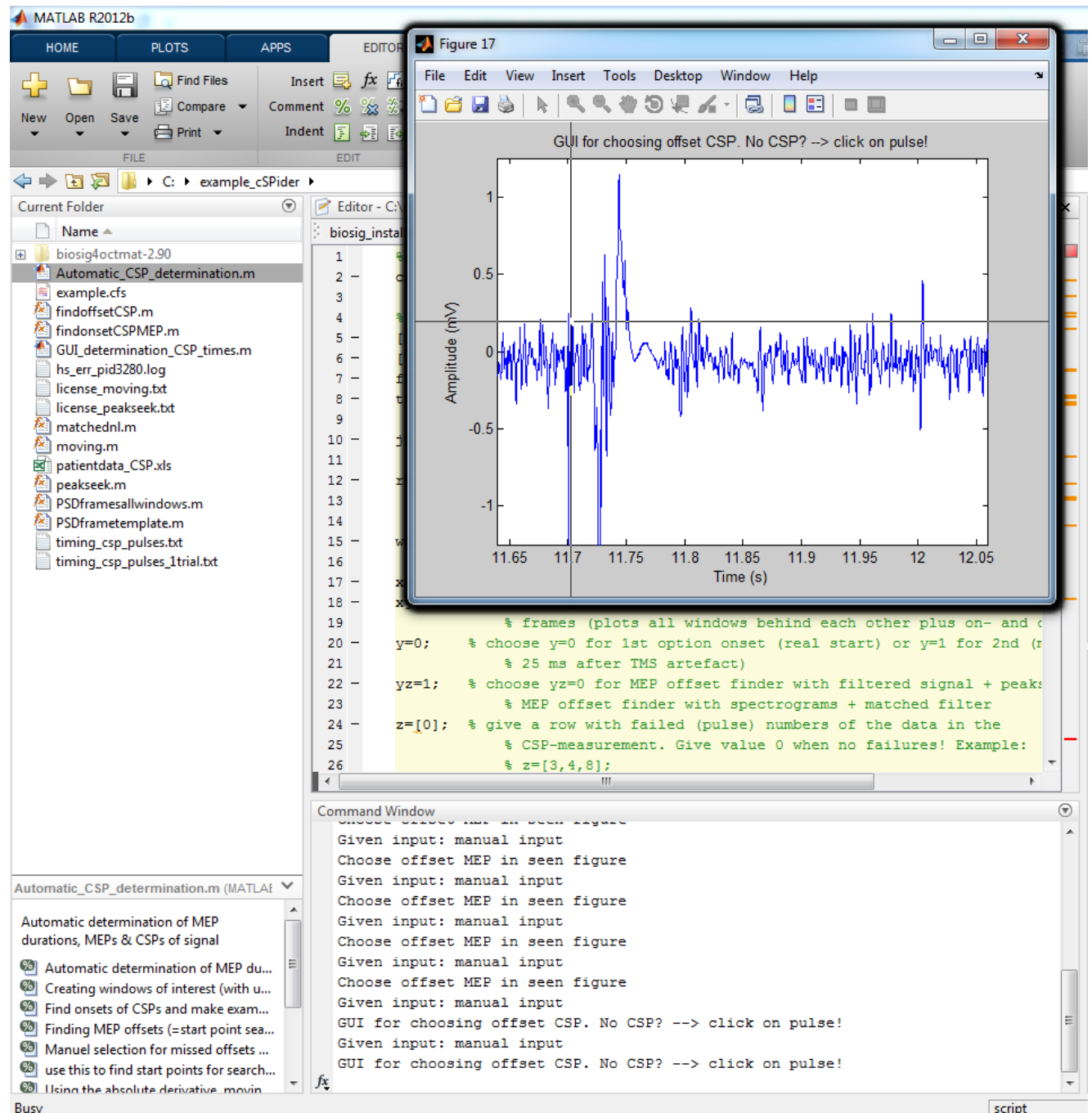




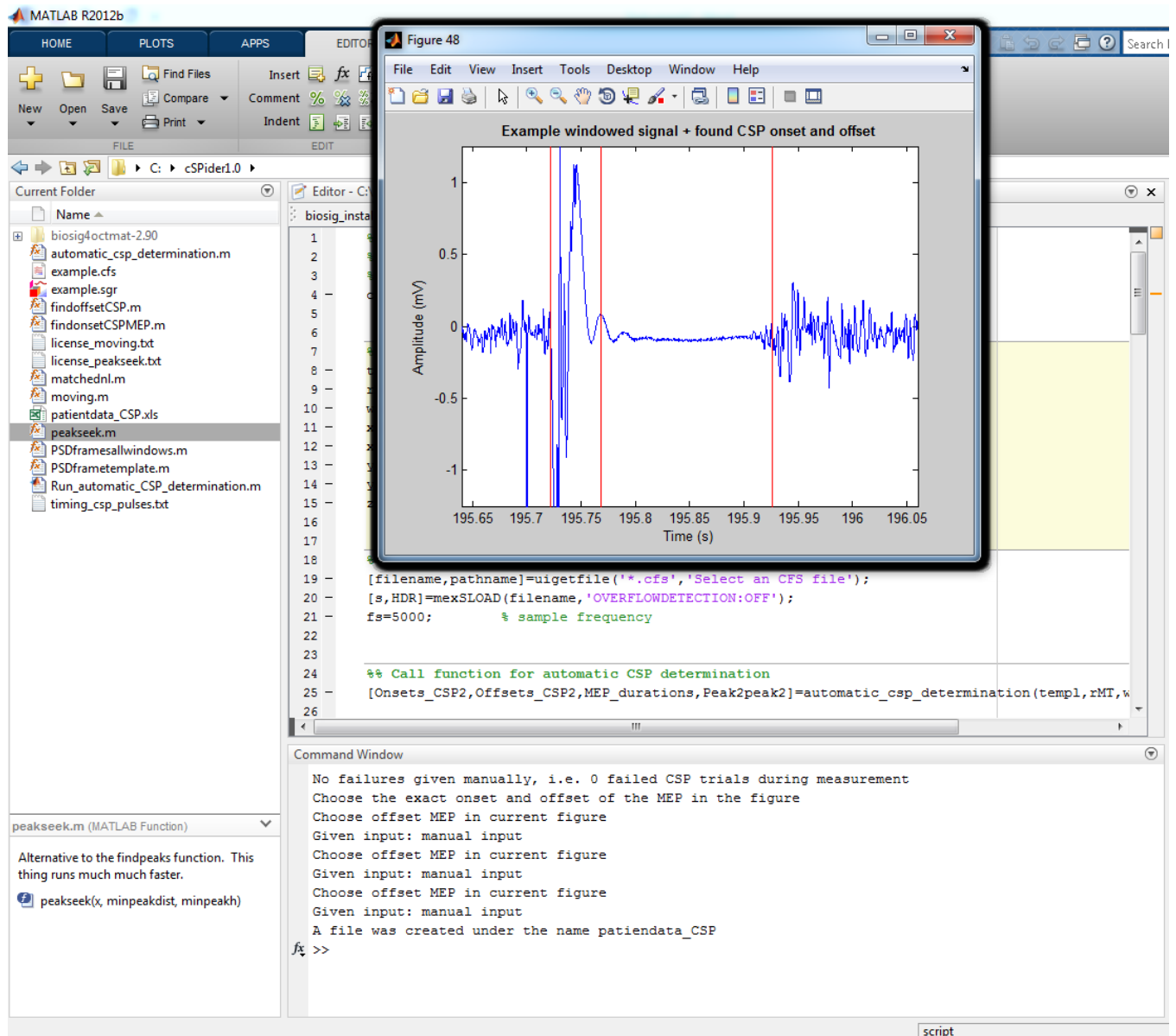
Another window might open for choosing the offset of another MEP – if no MEP is seen click on pulse artefact or somewhere in the beginning of the window.



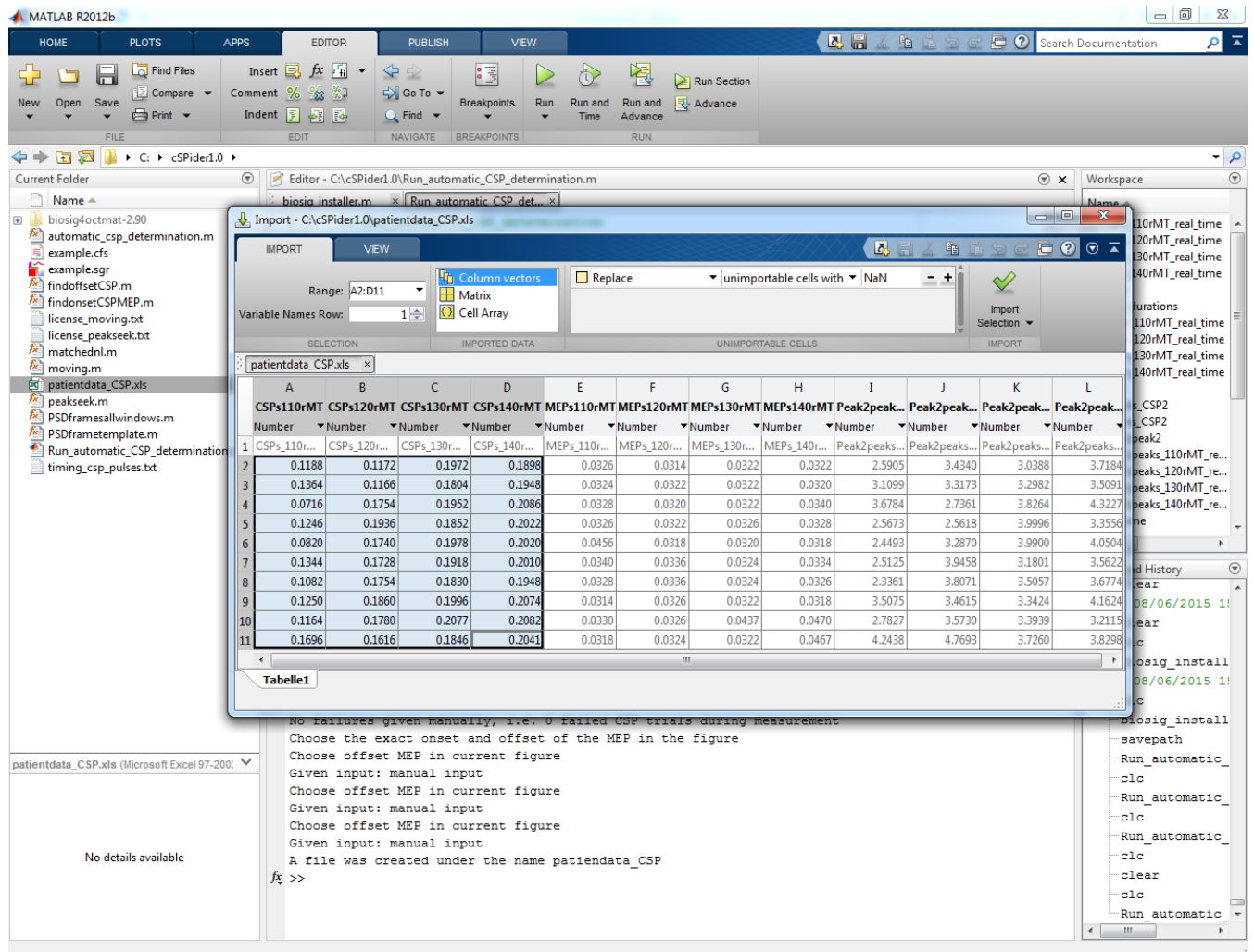
Step 4: Sometimes the CSP determination is not 100% clear, then you get the chance to choose the CSP offset manually. Or there actually isn't a CSP - then click on the pulse artefact.



Step 5: An example window opens showing detected onset and offset of CSPs.



Step 6: Finally all detected CSPs are stored in patientdata_CSP.xls.



The screenshot shows the MATLAB R2012b environment. The 'Import' dialog box is open, displaying the data from the Excel file 'patientdata_CSP.xls'. The data is organized into columns for different CSP types (CSPs110rMT, CSPs120rMT, CSPs130rMT, CSPs140rMT, MEPs110rMT, MEPs120rMT, MEPs130rMT, MEPs140rMT, Peak2peak..., Peak2peak..., Peak2peak..., Peak2peak...) and their corresponding peak-to-peak durations. The 'Import' button is highlighted, indicating the data is ready to be loaded into the workspace.

Number	CSPs110rMT	CSPs120rMT	CSPs130rMT	CSPs140rMT	MEPs110rMT	MEPs120rMT	MEPs130rMT	MEPs140rMT	Peak2peak...	Peak2peak...	Peak2peak...	Peak2peak...
1	0.1188	0.1172	0.1972	0.1898	0.0326	0.0314	0.0322	0.0322	2.5905	3.4340	3.0388	3.7184
2	0.1364	0.1166	0.1804	0.1948	0.0324	0.0322	0.0322	0.0320	3.1099	3.3173	3.2982	3.5091
3	0.0716	0.1754	0.1952	0.2086	0.0328	0.0320	0.0322	0.0340	3.6784	2.7361	3.8264	4.3227
4	0.1246	0.1936	0.1852	0.2022	0.0326	0.0322	0.0326	0.0328	2.5673	2.5618	3.9996	3.3556
5	0.0820	0.1740	0.1978	0.2020	0.0456	0.0318	0.0320	0.0318	2.4493	3.2870	3.9900	4.0504
6	0.1344	0.1728	0.1918	0.2010	0.0340	0.0336	0.0324	0.0334	2.5125	3.9458	3.1801	3.5622
7	0.1082	0.1754	0.1830	0.1948	0.0328	0.0336	0.0324	0.0326	2.3361	3.8071	3.5057	3.6774
8	0.1250	0.1860	0.1996	0.2074	0.0314	0.0326	0.0322	0.0318	3.5075	3.4615	3.3424	4.1624
9	0.1164	0.1780	0.2077	0.2082	0.0330	0.0326	0.0437	0.0470	2.7827	3.5730	3.3939	3.2115
10	0.1696	0.1616	0.1846	0.2041	0.0318	0.0324	0.0322	0.0467	4.2438	4.7693	3.7260	3.8298

Besides, values for MEP durations (in seconds) and amplitude sizes are stored.