

### Summary of example:

The input data file ("131117-C2\_short.dat") contains one trace obtained from a ca1 layer pyramidal cell by using current clamp.

The cell was excited by a short 500pA and by a long 10pA pulse injected into the soma, so you have to use

the provided stimuli file (for this, select the "Custom Waveform" option from the dropdown menu on the

stimuli layer and then load the file: "cell2\_stim.dat").

The data trace is 1500ms long and the sampling frequency was 20kHz.

The provided model is a passive one and it's based on a precise reconstruction, and we are interested in

the cm, Ra, g\_pas parameters.

Because we had to set the e\_pas parameter to 0 and we wanted to optimize the previous parameters in

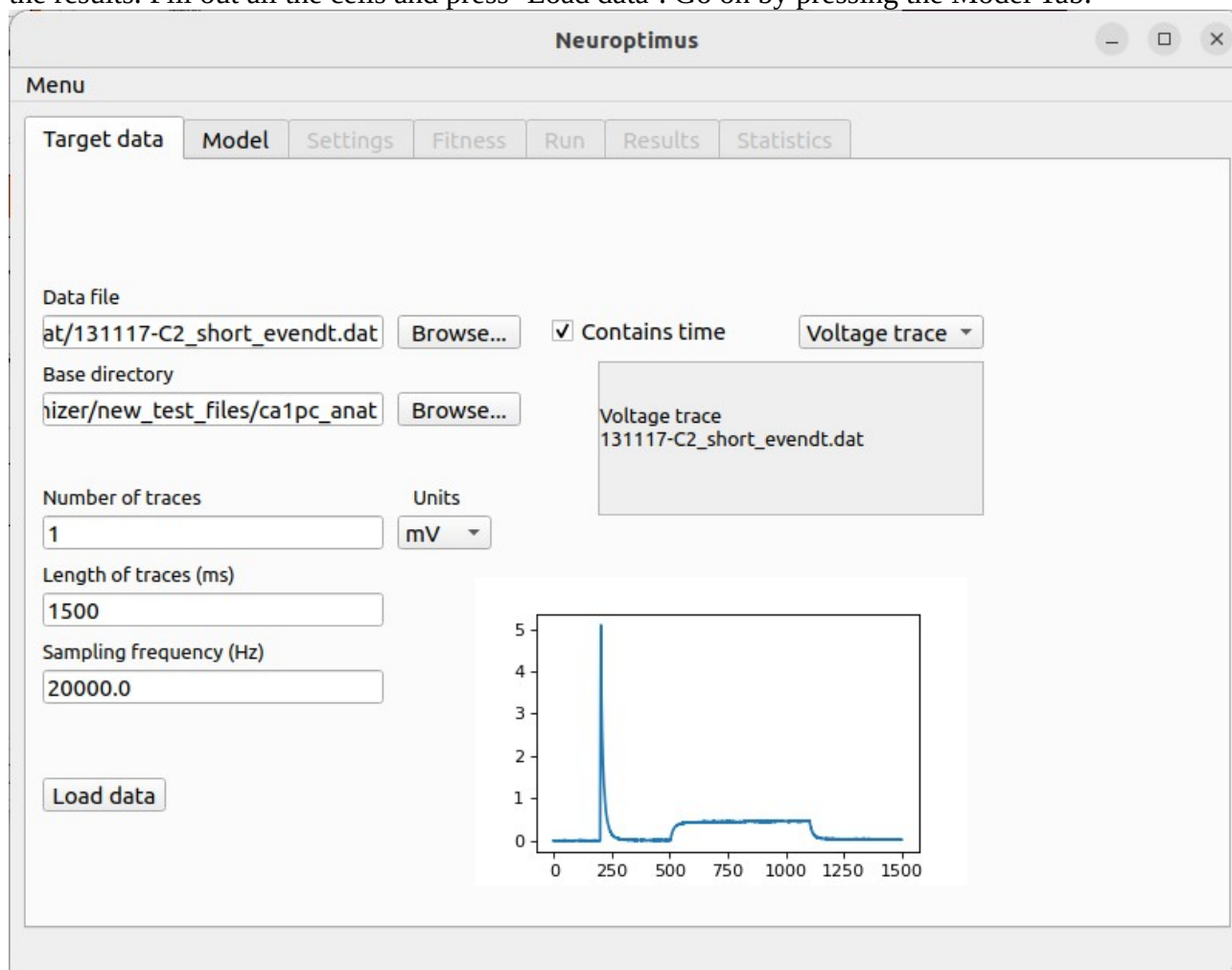
every section, we created a function to do this for us (see "udeffun\_pyr\_3param.txt"), you can load this on

the model selection layer.

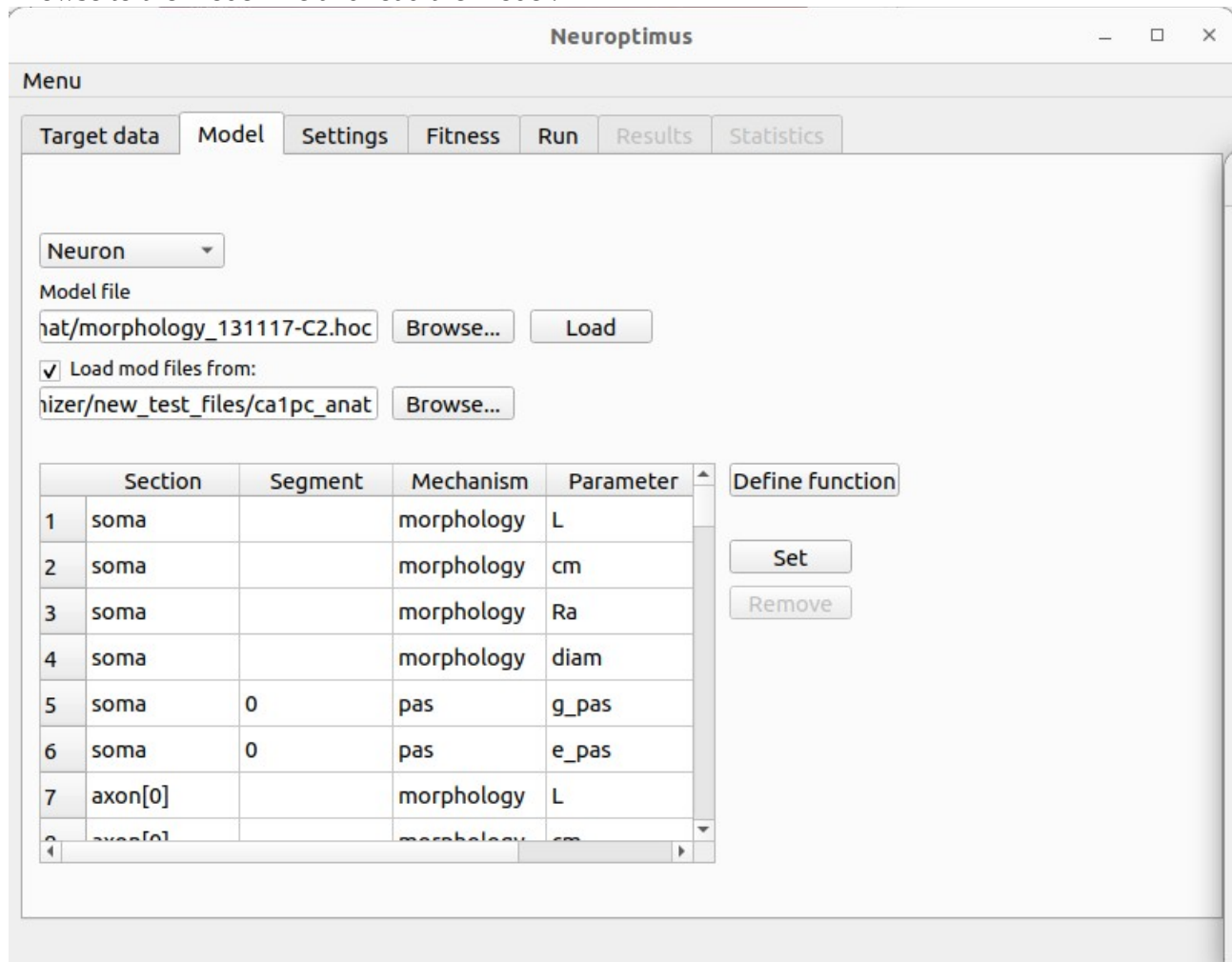
### Step-by-step instructions to run the example from the Optimizer GUI:

Run „python3 optimizer.py -g” to start the GUI

At 'Data File' load the target data, at 'Base Directory' choose the directory where you want to save the results. Fill out all the cells and press 'Load data'. Go on by pressing the Model Tab.



Browse to the model file and load the model.



Press the 'Define Function' button to load the user defined function:  
Press 'Ok', then go on by pressing the Settings Tab.

Neuroptimus

Menu

Target data Model Settings Fitness Run Results Statistics

Stimulation protocol  
IClamp

Stimulus Type  
Custom Waveform

Load Waveform

Delay (ms)  
0

Duration (ms)  
1e9

Section  
soma

Position inside section  
0.5

Parameter to record  
v

Section  
soma

Position inside section  
0.5

Initial voltage (mV)  
-65

tstop (ms)  
1500.0

Time step  
0.05

Choose 'Custom Waveform' as 'Stimulus Type', then press 'Load Waveform' to load the file:  
cell2\_stim.dat  
Go on by pressing the Fitness Tab.

Neuroptimus

Menu

Target dataModelSettingsFitnessRunResultsStatistics

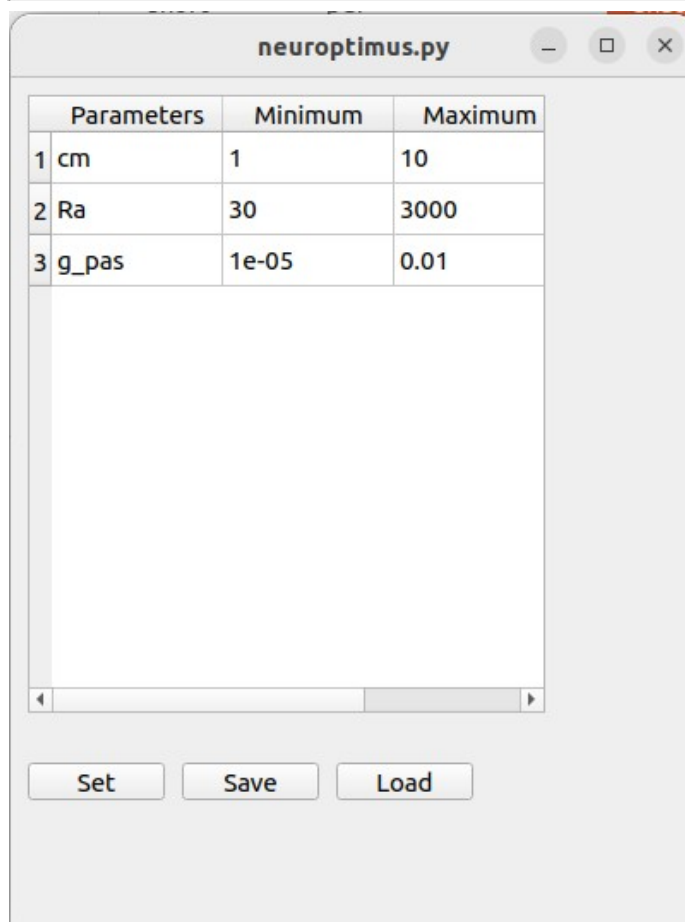
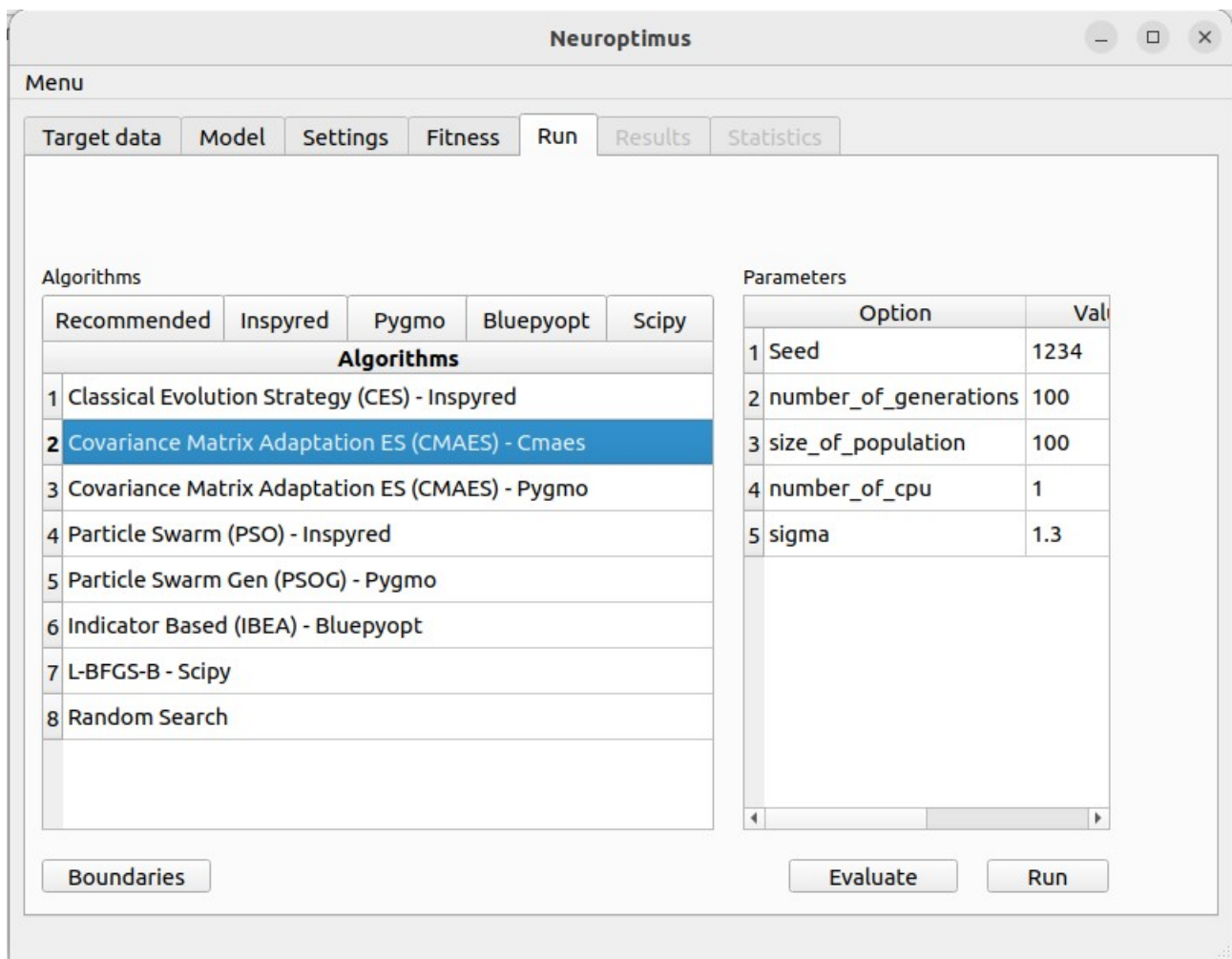
Normalize

	Fitness functions	Weights
1	MSE	1
2	MSE (excl. spikes)	0
3	Spike count	0
4	Spike count (stim.)	0
5	ISI differences	0
6	Latency to 1st spike	0
7	AP amplitude	0
8	AHP depth	0
9	AP width	0
10	Derivative difference	0

Spike detection tresh. (mV)  
0.0

Spike window (ms)  
1.0

Choose fitness function(s), and define their weights. Go on by pressing the Run Tab.



Select an algorithm, and press the 'Boundaries' button to define the boundaries of the parameters to be optimized: Press 'Set'. Start the optimization pressing the 'Run' button.