

### Summary of example:

The data trace was obtained from a biophysically accurate reconstruction of a CA1 layer pyramidal cell, by stimulating the somatic section with a 200 pA current stimuli. The experiment lasted for 1000 ms and the stimuli started at 200 ms and lasted for 600 ms (ended at 800 ms). The sampling frequency was 5kHz.

### WARNING: the data is given in V not in mV

The model was created by clusterizing the branches of the detailed model into 6 compartments, the parameter values of the channels were obtained by averaging the values in the detailed model.

The somatic parameters are the subjects of optimization.

The additional mechanisms required by the model are in the mod\_files folder. You must run the `nrnivmodl`

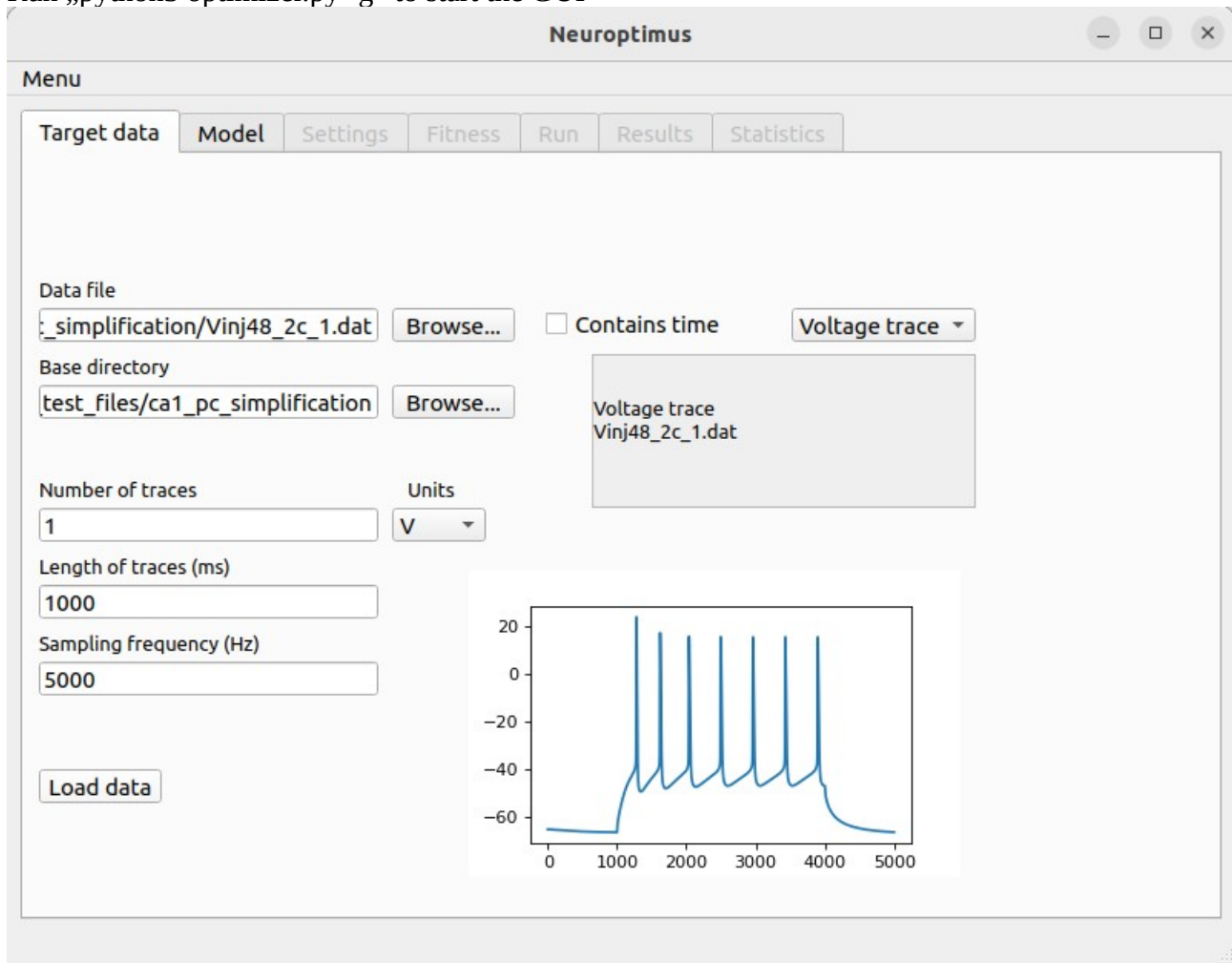
command to obtain the necessary files (you should select the folder containing the files obtained by `nrnivmodl` as the special folder in the program)

input file: `Vinj48_2c_1.dat`

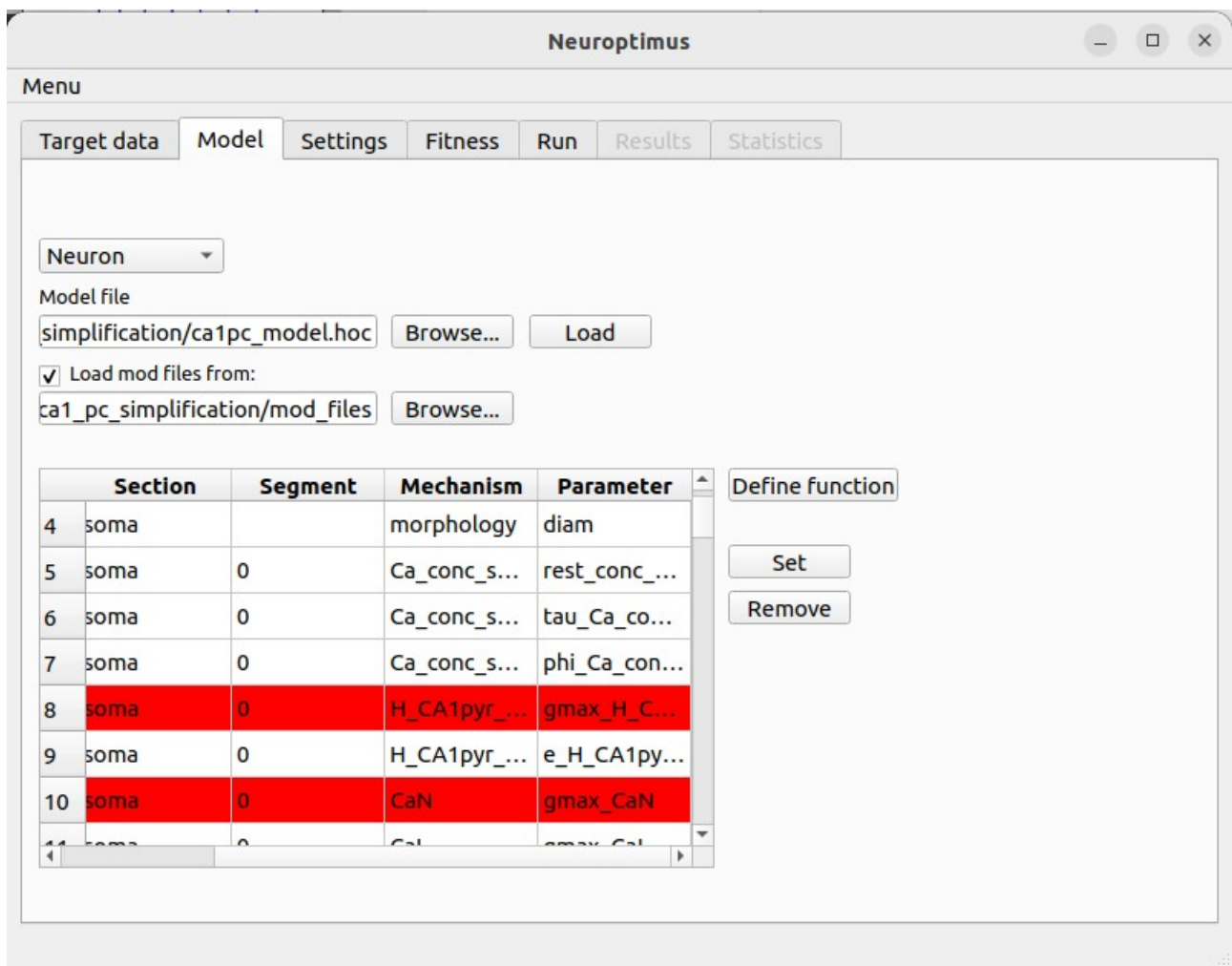
model: `ca1pc_model.hoc`

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

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



At 'DataFile' 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 to the directory containing the mod files, then load the model. To select a

parameter click first on the parameter, then press 'Set'. Repeat it to select a new parameter.

Select the following parameters:

soma 0 H\_CA1pyr\_prox gmax\_H\_CA1pyr\_prox

soma 0 CaN gmax\_CaN

soma 0 CaL gmax\_CaL

soma 0 K\_AHP gmax\_K\_AHP

soma 0 K\_C\_1D gmax\_K\_C\_1D

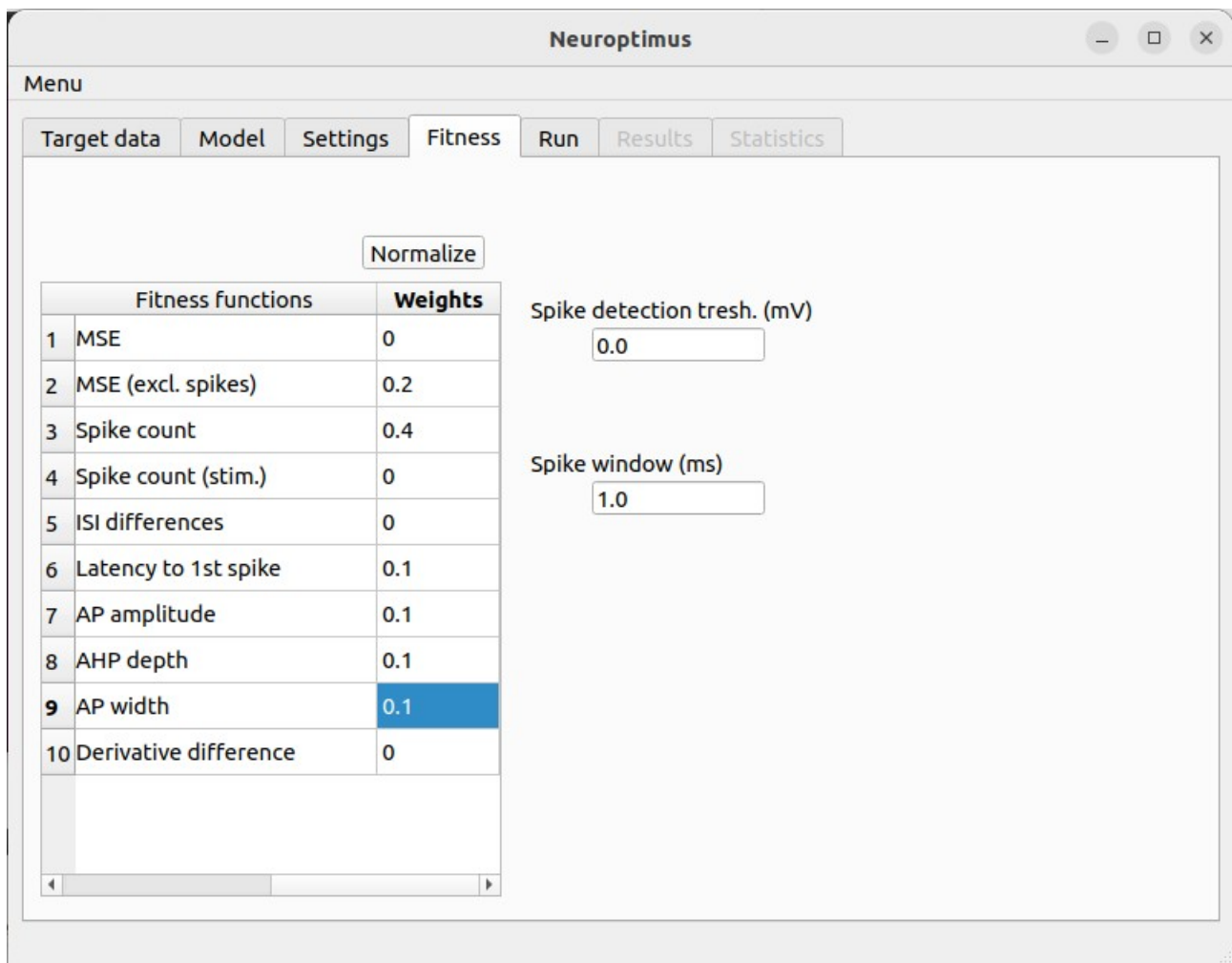
soma 0 K\_M gmax\_K\_M

soma 0 K\_A\_prox gmax\_K\_A\_prox

soma 0 K\_DR gmax\_K\_DR

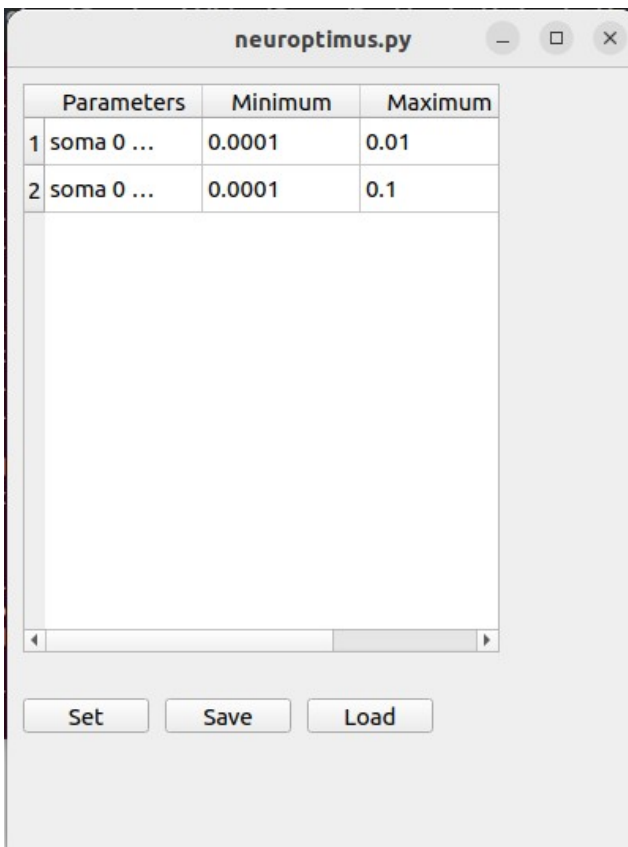
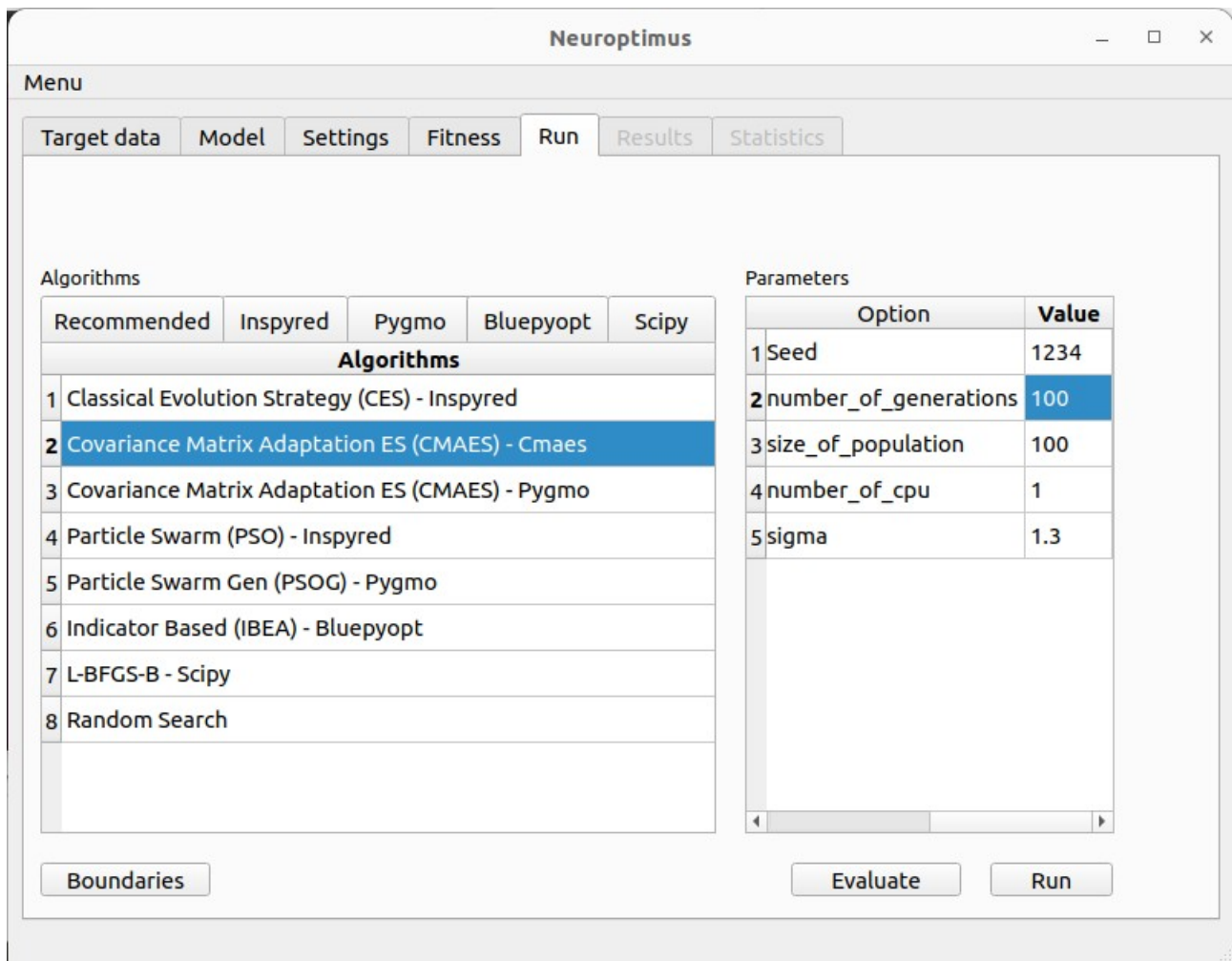
soma 0 Na\_soma gmax\_Na\_soma





Go on by pressing the Fitness Tab.

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.  
 Boundaries can also be loaded from a file.