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)
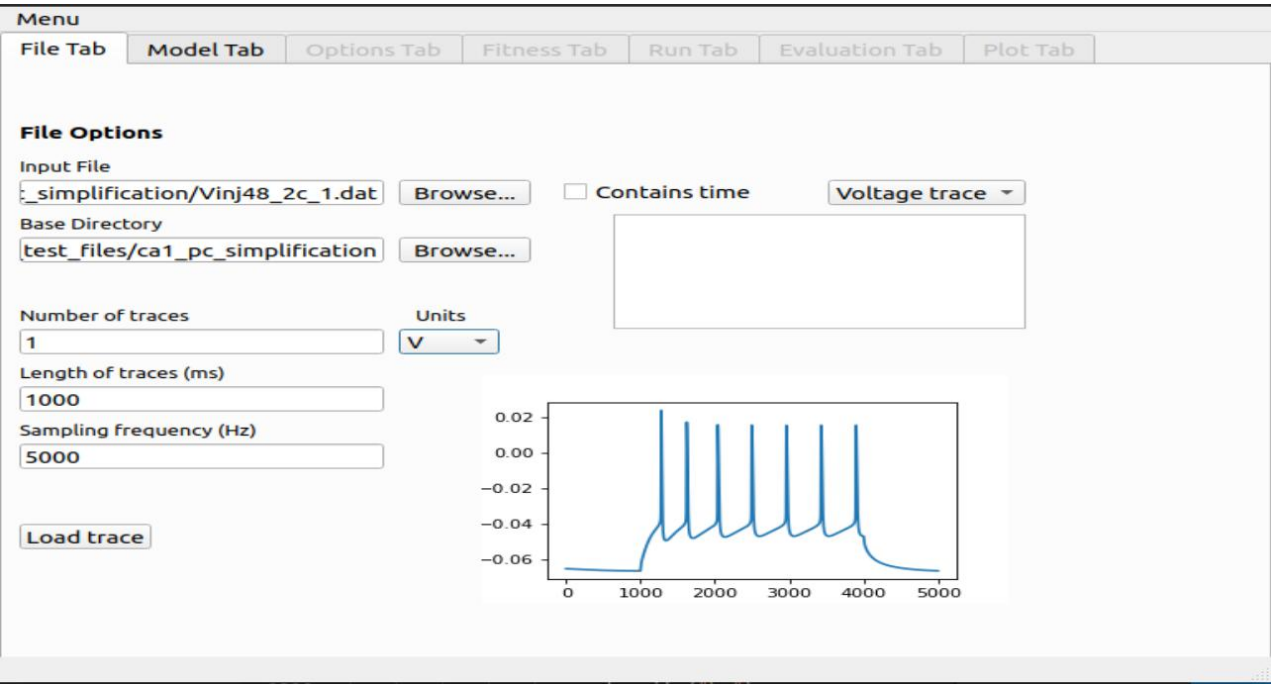
input file: Vinj48_2c_1.dat

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 'Input 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 trace'. 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
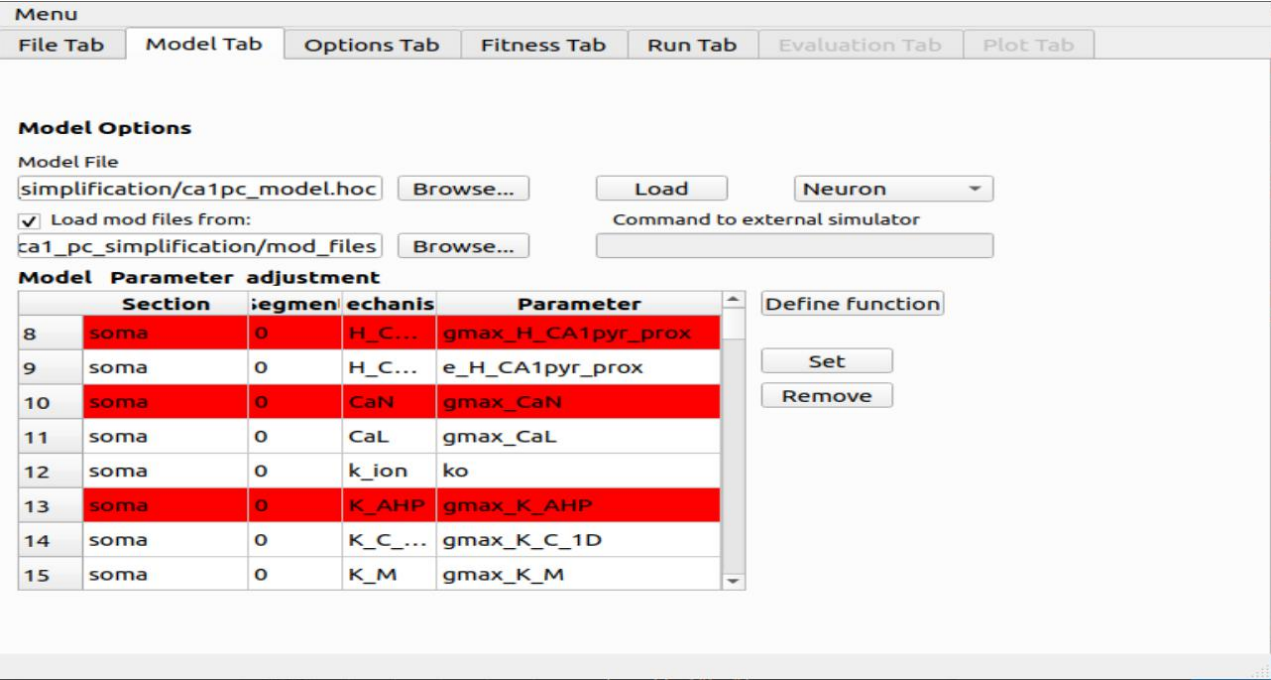
soma 0 CaL gmax_CaL

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 Options Tab.

Fill in all the cells. Press 'Amplitude(s)' to open the 'Set Amplitude(s) window.

Go on by pressing the right arrow

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

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.