

**Summary of example:**

The data file has one trace, which is 1000 ms long and the sampling frequency was 40kHz.

The data file also contains the time and was obtained from the corresponding model by using an IClamp (connected to the middle (0.5) of the soma) with the following parameters:

stim.del=200

stim.dur=500

stim.amp=0.3

The following model parameters were set (the others are default):

gnabar\_hh=0.1

gkbar\_hh=0.03

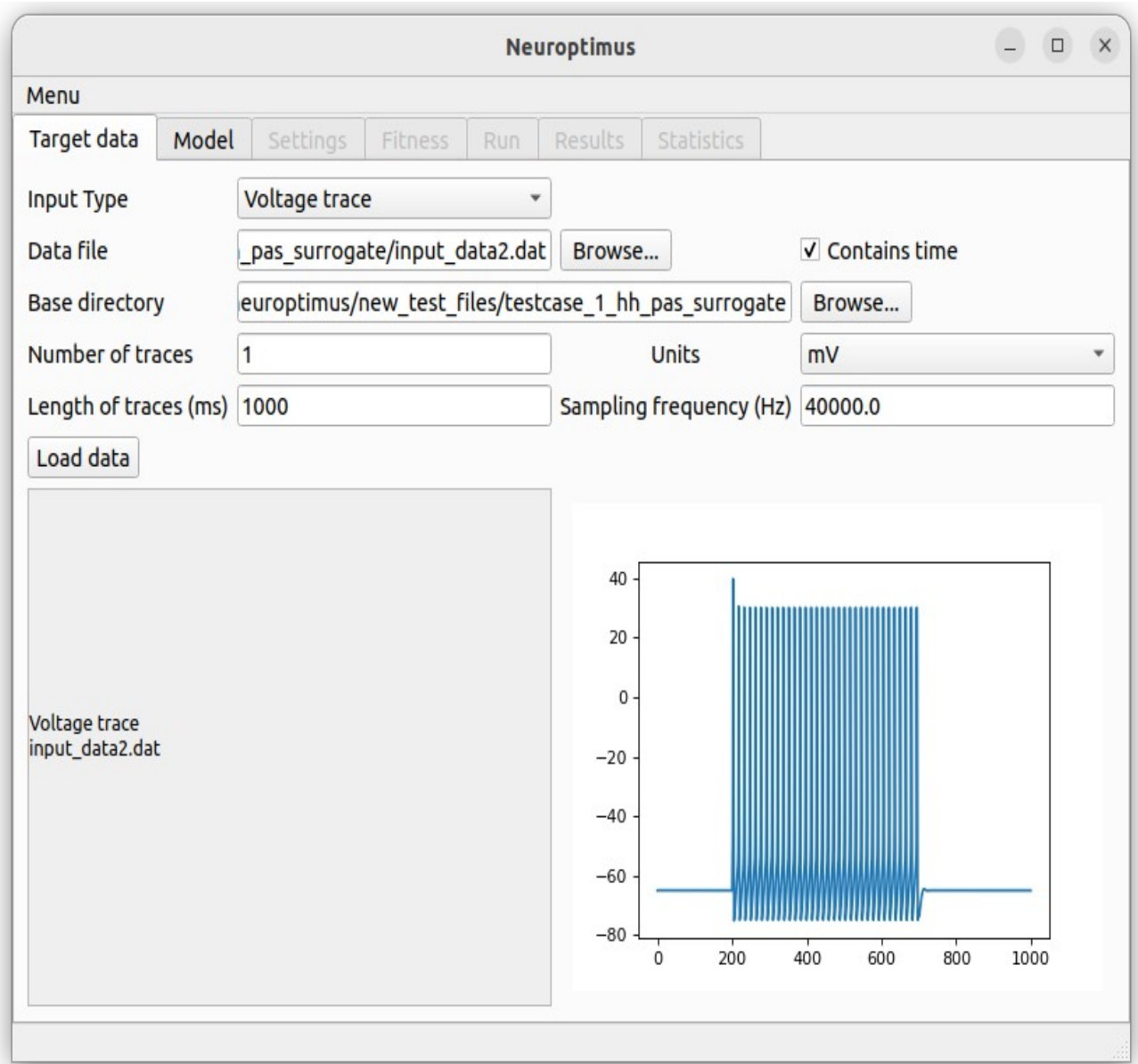
gl\_hh=0.0001

**input file:** "input\_data2.dat"

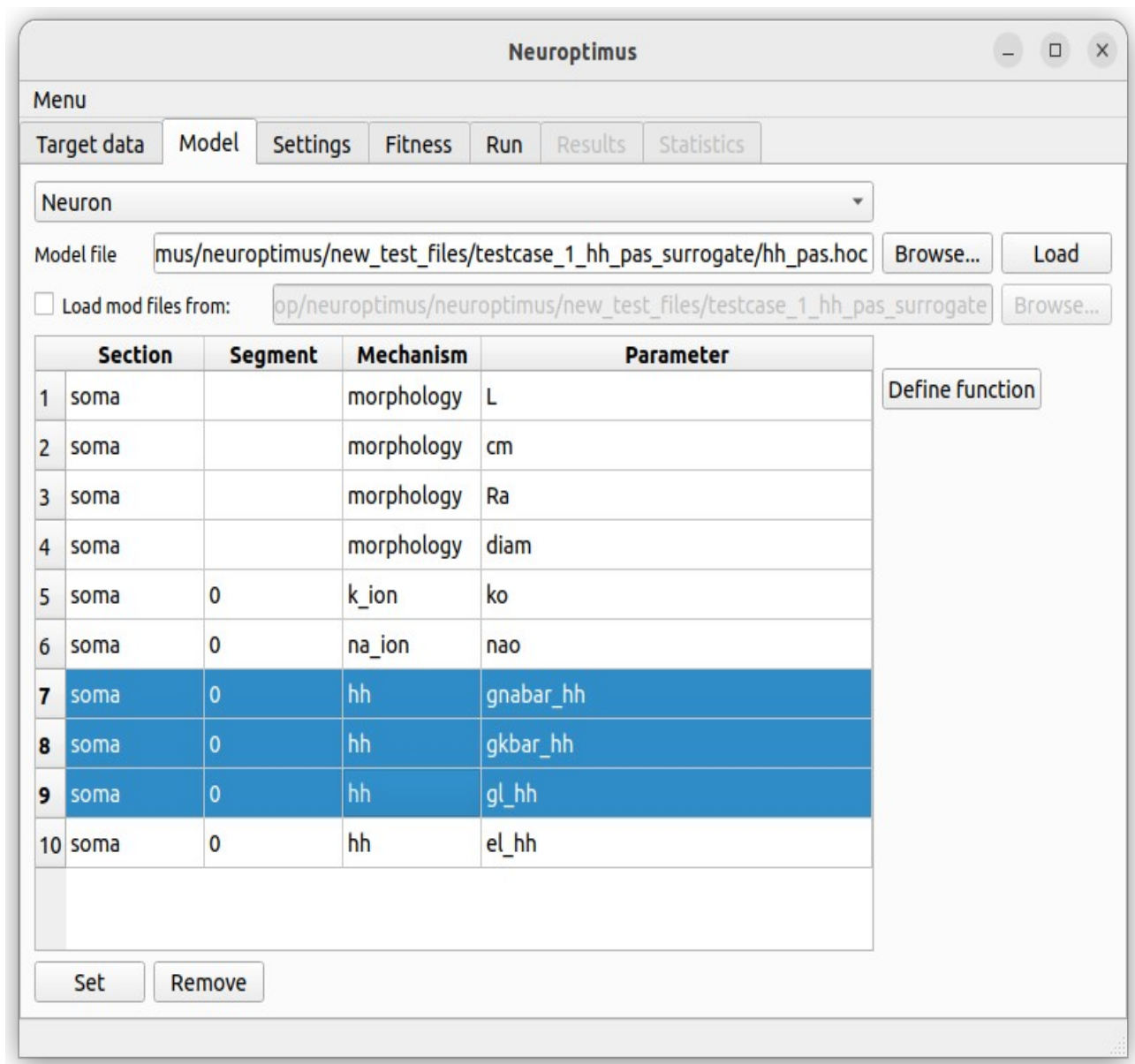
**model:** hh\_pas.hoc

**Step-by-step instructions to run the example from the Neuroptimus GUI:**

Run „python3 neuroptimus.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. Select the parameters, then press 'Set'. Go on by pressing the Settings Tab.

Neuroptimus

Menu

Target data

Model

Settings

Fitness

Run

Results

Statistics

Stimulation protocol

IClamp

Stimulus Type

Step Protocol

Amplitude(s)

Stimulation Time Settings

Delay (ms)

200

Duration (ms)

500

Stimulus Position Configuration

Section

soma

Position inside section

0.5

Recording Settings

Parameter to record

v

Section

soma

Position inside section

0.5

Simulation Settings

Initial voltage (mV)

-65

tstop (ms)

1000.0

Time step

0.05

Fill in all the cells. Press 'Amplitude(s)' to open a new window. and set the amplitude of the stimulus.

Stimuli Window

Number of stimuli: 1

Create

Amplitude (nA)

1	0.3
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Accept

Go on by pressing the Fitness Tab.

The screenshot shows the Neuroptimus software window. The 'Fitness' tab is selected in the menu bar. A table lists 10 fitness functions and their weights. The 8th row, 'AHP depth', is highlighted. To the right, the 'Spike Detection Parameters' section shows input fields for 'Spike detection tresh. (mV)' and 'Spike window (ms)'.

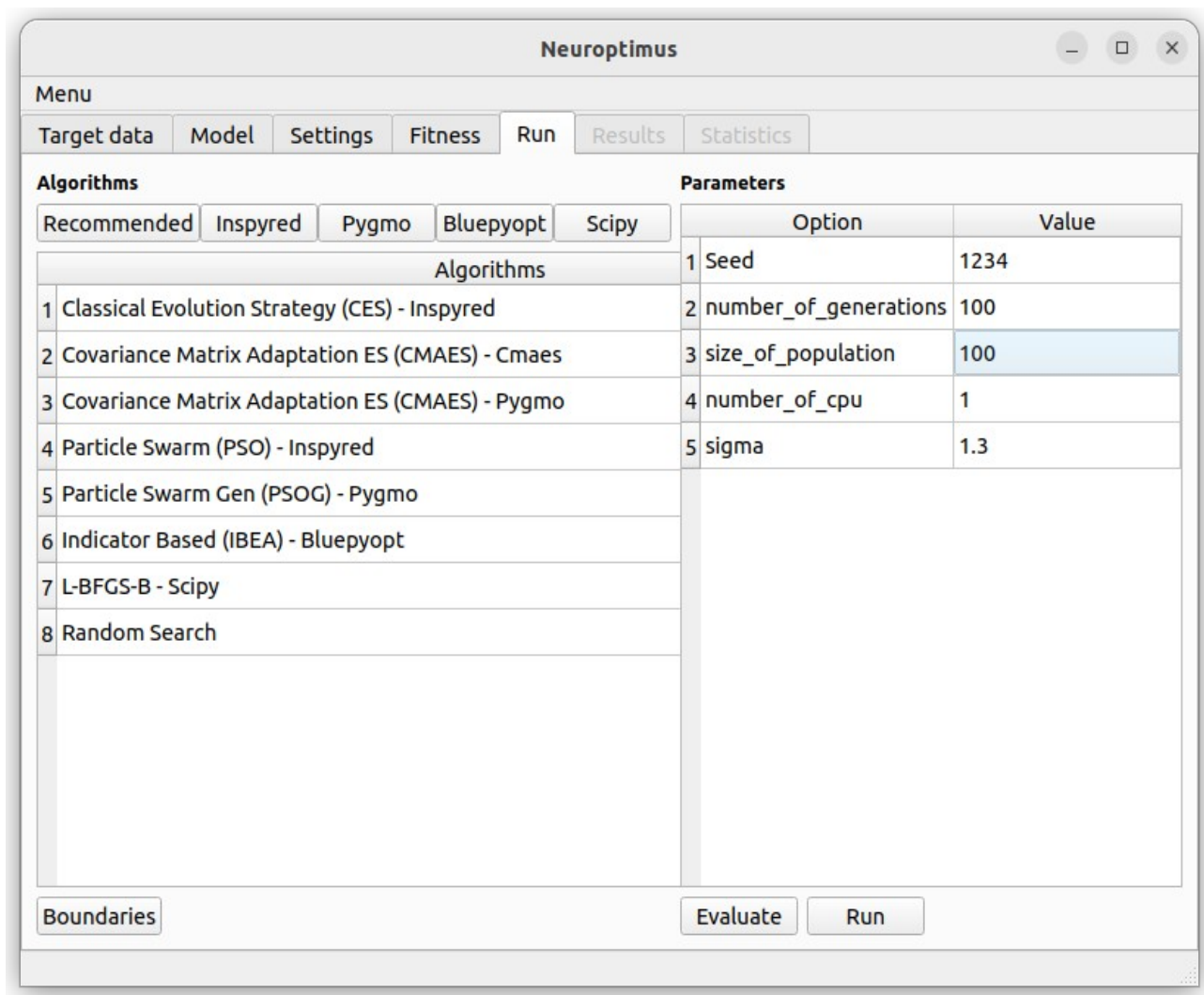
	Fitness functions	Weights
1	MSE	0
2	MSE (excl. spikes)	0.25
3	Spike count	0
4	Spike count (stim.)	0.25
5	ISI differences	0
6	Latency to 1st spike	0
7	AP amplitude	0.25
8	AHP depth	0.25
9	AP width	0
10	Derivative difference	0

**Spike Detection Parameters**

Spike detection tresh. (mV)

Spike window (ms)

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

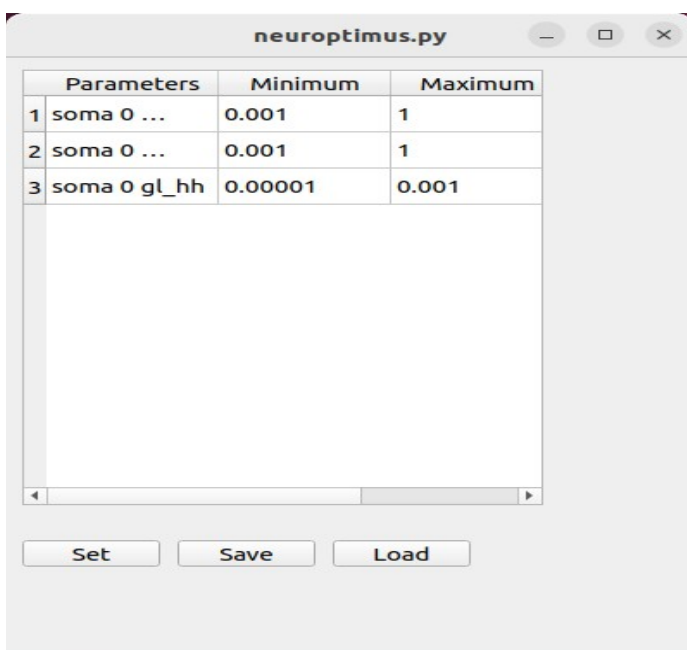


Select an algorithm, and set its parameters.

Press the 'Boundaries' button to define the boundaries of the parameters to be optimized:

Press 'Set'.

Boundaries can also be loaded from a file.



Start the optimization pressing the 'Run' button.