

**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

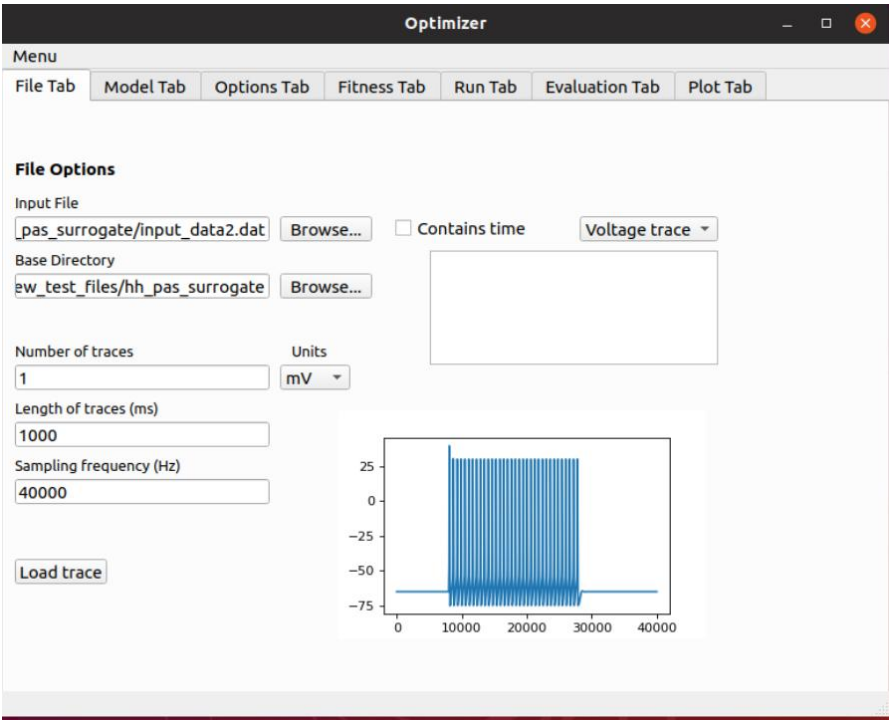
input file: "input\_data2.dat"

model: hh\_pas.hoc

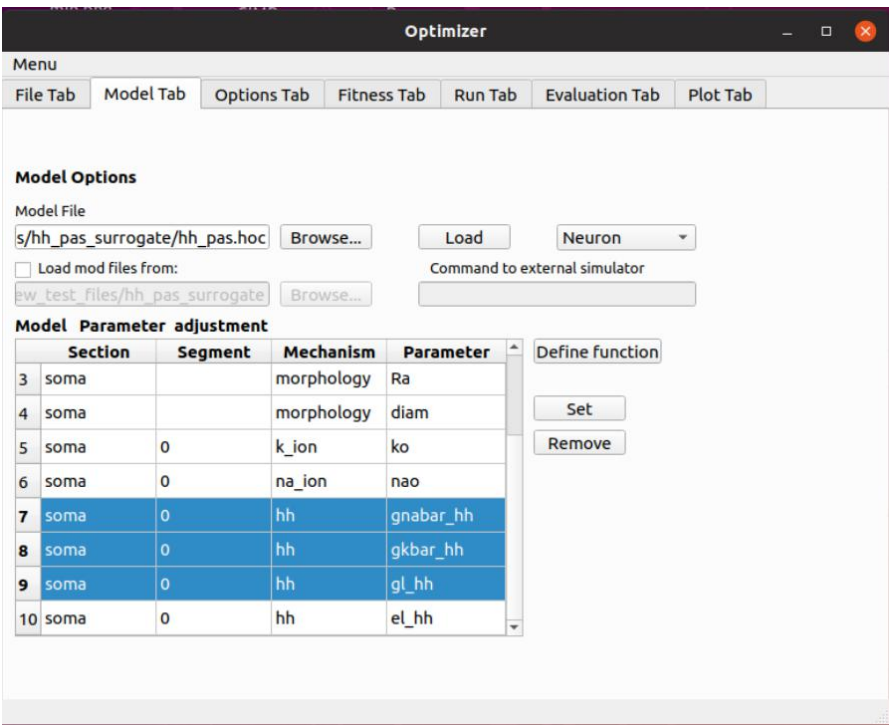
**Step-by-step instructions to run the example from the Optimizer GUI:**

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

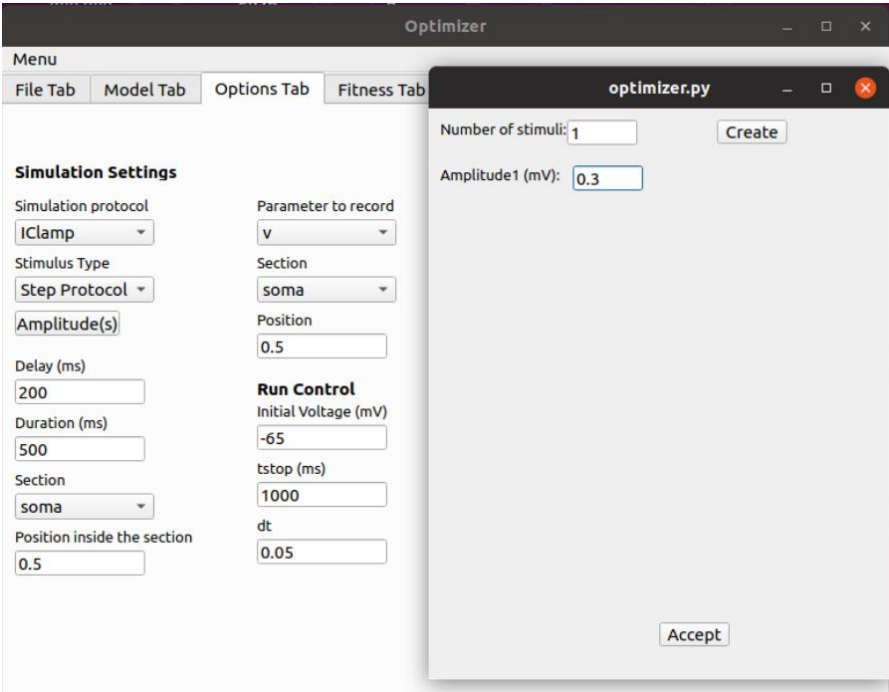
At 'Input File' load the target data, at 'Base Directory' choose the directory where you want to save the results. Fill out all the cells and press 'Load trace'. Go on by pressing the Model Tab.



Browse to the model file and load the model. To select a parameter click first on the parameter, then press 'Set'. Repeat it to select a new parameter.



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 Fitness Tab.

Optimizer

Menu

File TabModel TabOptions TabFitness TabRun TabEvaluation TabPlot Tab

Fitness Functions

Normalize

	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
11	PPTD	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.

Optimizer

Menu

File TabModel TabOptions TabFitness TabRun TabEvaluation TabPlot Tab

Optimizer Settings

Algorithms

ecommente

Inspyred

Pygmo

Bluepyopt

Scipy

Algorithms

1 Evolutionary Algorithm (EA) - Inspyred

2 Covariance Matrix Adaptation ES (CMAES) - Pygmo

3 Particle Swarm (PSO) - Inspyred

4 Indicator Based (IBEA) - Bluepyopt

5 L-BFGS-B - Scipy

Parameters

	Aspects	Num
1	Seed	1234
2	Size of Population:	100
3	Number of Generations:	100
4	Mutation Rate:	0.25
5	Number of CPU:	1

Boundaries

Starting Points

Run

Select an algorithm, and press the 'Boundaries' button to define the boundaries of the parameters to be optimized:

	Parameters	Minimum	Maximum
1	soma 0 qnabar hh	0.001	1
2	soma 0 qkbar hh	0.001	1
3	soma 0 gl_hh	0.00001	0.001

Set

Save

Load

Press 'Set'.

Start the optimization pressing the 'Run' button.