

S6: Description of the Python code, experimental and simulated data

Here, we summarize the material used to produce the results presented in the paper and the appendices. The Python scripts used to present the experimental data, implement the computational model, train and test the model, and prepare the result figures are available in modelDB. The repository is currently private and the accession code will be shared with reviewers. Upon acceptance, the code will be made public.

The experimental data set needed to reproduce the results can be found in:

flexible_protocol/Experimental_BL_BS_histograms.p (saved in the format compatible with Python 2.7)

flexible_protocol/Experimental_BL_BS_histograms_for_Python3.py (the format compatible with Python 3.3)

The code used to implement the flexible protocol, analyze the results and prepare figures (Fig 3, 4, 5) shown in the paper and the Appendices 3 and 4 is saved in the folder 'flexible_protocol'. All code is written in Python. Implementation and simulation of spiking neuronal network models is done in Brian2 simulator.

The code used to implement the constrained protocol, analyze the results and prepare figures (Fig 6,7,8) and the Appendix 5 is saved in the folder 'constrained_protocol'. The code is written in Python and implementation of the spiking neuronal network model is done in Neuron simulator, version 7.5-7.7.

The genetic algorithm, used for optimization, is a publicly available Python package presented in Bahl et al (2012) and also used in Mäki-Marttunen et al (2017). The package can be downloaded from: <https://projects.g-node.org/emoo/>

The following Python scripts are used to plot individual result figures:

Figure	modelDB folder	Code
Figure 2	flexible_protocol	Fig2.py
Figure3	flexible_protocol	convergence_best_model_Fig3_Fig4.py
Figure 4 Fig 4A-H Fig 4I-M Fig 4N, Fig A3-5 Fig 4O	flexible_protocol	convergence_best_model_Fig3_Fig4.py Fig4.py Fig4_plot_sensitivity.py Fig4O_sensitivity_summary.py
Figure 5 Fig 5A-J Fig 5K,L	flexible_protocol	Fig5.py Fig5_KL.py
Figure 6 Fig 6A Fig 6B	constrained_protocol	drawfig0a.py drawfig0b.py

Figure 7 Fig 7A-E Fig 7F-J Fig 7K-L Fig 7M	constrained_protocol	drawfig1.py drawfig2.py drawfig3.py drawfig4.py
Figure 8	constrained_protocol	Drawfig5.py