Drehbuch “NEST Desktop in Action”

A Workshop Script for NEST Desktop

## Example 1: First steps to create a neuron

* Create neuron n1
* Create stimulator dc1
* Change stimulator dc1 to noise generator ng1
* Connect ng1 to n1
* Create recorder vm1
* Connect vm1 to n1
* Select parameters of ng1: mean, std, start and stop
* Set values in ng1: mean: 100, std: 50, start: 200, stop: 700
* Simulate
* View the activity
* Try to find rheobase current (current at which the cell begins to spike). How does the noise affect the rheobase? Does it go up or down when noise goes up and down?

### Example 2: Balanced network dynamics

* Create 2 neuron populations (n1, n2)
* Set populations n1: 800, n2: 200
* Connect between and within the n1/n2 populations (n1 → n1, n1 → n2, n2 → n1, n2 → n2) (via context menu)
* Change the rule of all recurrent connections to pairwise bernoulli (with p = 0.1)
* Set synaptic weight of all excitatory neurons, j\_exc = 2, and all inhibitory neurons: j\_inh = -2
* Create a spike recorder for each neuron population
* Connect the neuron population to their corresponding spike recorders (n1 → sr1, n2 → sr2)
* Create poisson generator pg1
* Connect pg1 to n1 and n2
* Set the rate 70000 Hz in pg1
* Simulate
* View the activity: It shows synchronous regular activity. For asynchronous irregular activity set j\_inh = -10.
* Try to change the network parameters to obtain the other network regimes from the paper.
* Export the Python code for the network and run it separately in a Jupyter notebook.