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Estimation of sigma:

In stateSpace.py, function estimate\_params is used to get sigma. The estimate\_params function  
takes in two input arguments, mon ‘spike monitor’ and time\_est ‘initial burst time’ specified in default\_params structure. The initial\_burst\_t is 50msec. In estimate\_params the spike times from the last layer are taken as input. Zip(\*mon.spikes) puts the spike time lists from all the 100 neurons in one package. The spike times, which is 100xruntime, in a time window of 30ms + synaptic delay from the initial burst time are taken. A standard deviation of spike times is then calculated in that time window by finding the mean spike time.

In short the logic is to determine the variation in spike times developed from the case if everything is synchronous in that time window.

Code snippets:

(91) initial\_burst\_t=50 \* ms

(196) net.run() #Runs the network simulation

(153) i, times = zip(\*mon.spikes)

(154) times = array(times) #datatype conversion from simple list to array

(155) times = times[abs(times - time\_est) < 15 \* ms]

(162) return (len(times),times.std())

(197) (newa, newsigma) = estimate\_params(net.mon[-1], params.initial\_burst\_t) #newsigma is the standard deviation for the last layer.