

PSY 265: Homework 6

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Spring 2018

We will be working with the network shown in **figure 1** below. Further information regarding the network setup can be found in homework assignment instructions 5 and 6.

1 Inject current to RSN_1

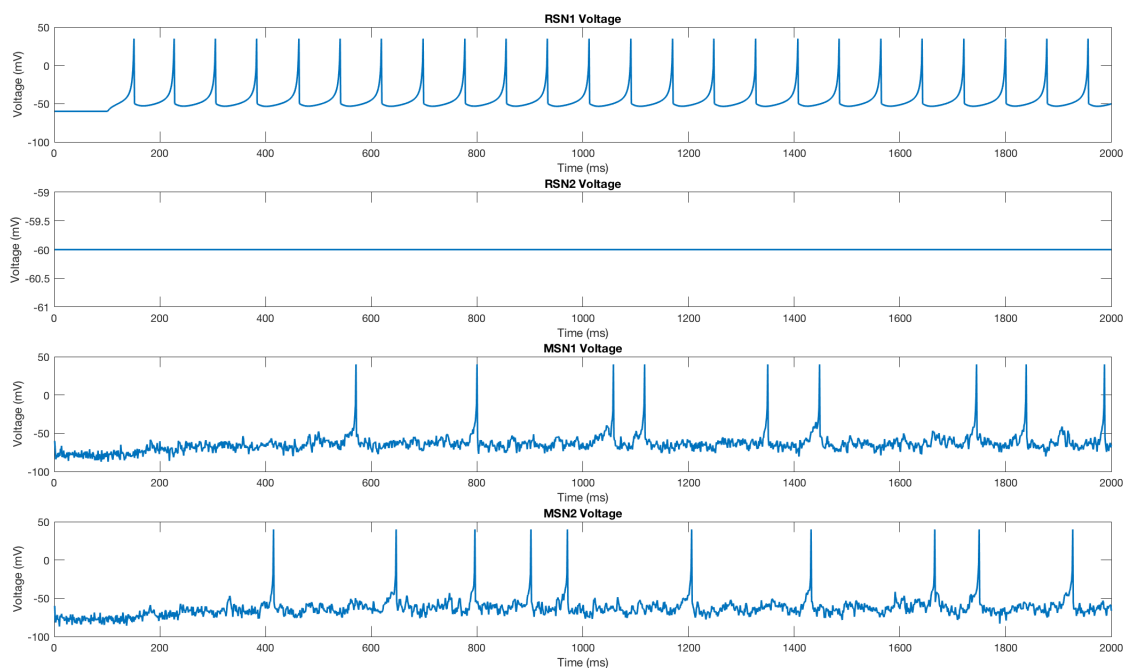


Figure 1: Voltage across time of neurons in the network after injecting a current into RSN_1 at $t = 100ms$.

2 Inject current to RSN_2

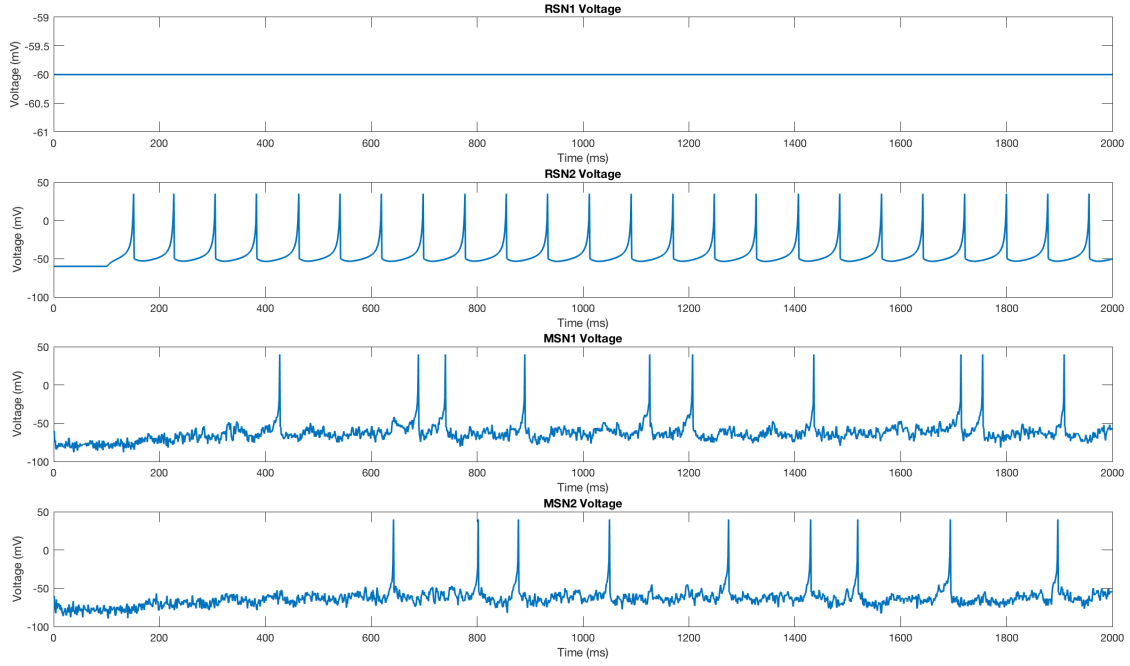


Figure 2: Voltage across time of neurons in the network after injecting a current into RSN_2 at $t = 100ms$.

3 Record the behavioral response of the network to stimulus 1 or 2

Trial	1	2	3	4	5	6	7	8	9	10
Response [1, 2]	2	1	1	1	1	2	1	2	1	1
Reaction Time (ms)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

4 Implement a reinforcement learning algorithm in the network to learn to respond correctly to stimulus 1 or 2

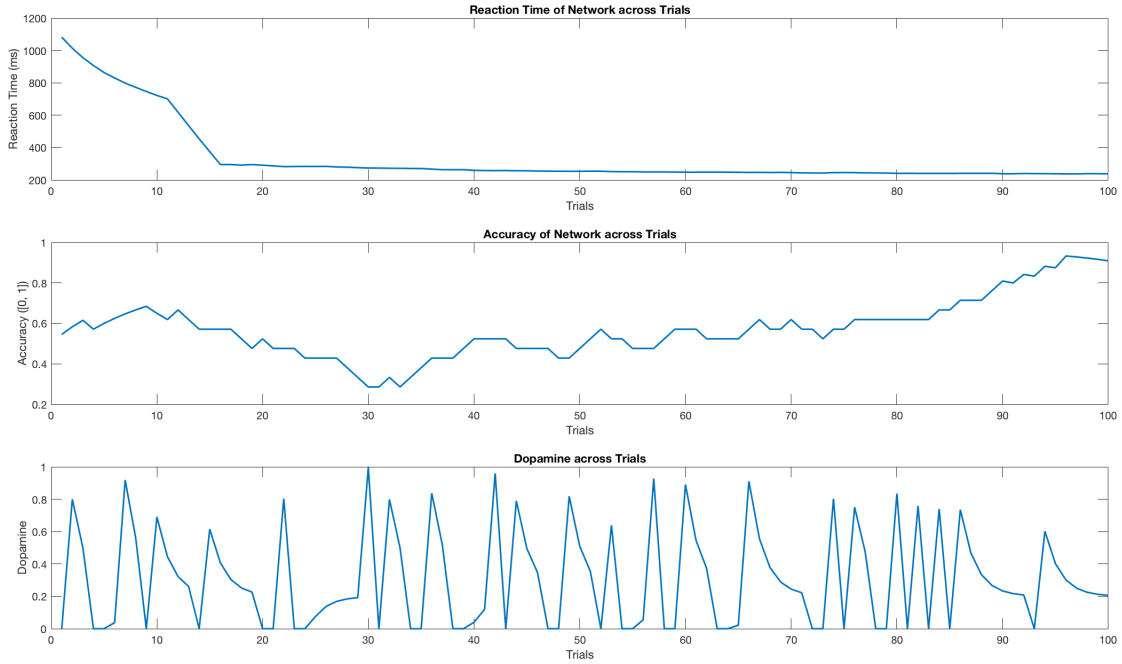


Figure 3: Behavioral network performance across 100 trials.

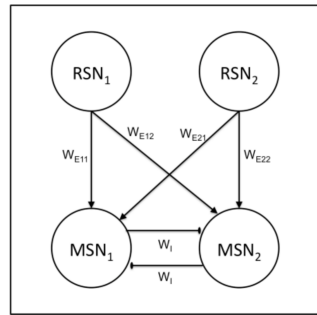


Figure 4: Simple network where regular spiking neurons (RSN) send excitatory input to the striatal medium spiny neurons (MSN) and the MSN neurons send inhibitory input to each other.

Below is a table showing the final weights after training over 100 trials.

W_{E11}	W_{E12}	W_{E21}	W_{E22}
606.2522	178.7574	157.3129	360.8321