**Theoretical Neuroscience BITS F317**

**2016-17 Sem-2**

**Assignment-3**

You may discuss with each other. If your discussion with anybody else has helped in your progress with the assignment you should acknowledge their help by mentioning their names & under a heading “Acknowledgment”. If the entire assignment has been carried out in collaboration with another individual, then both names should be written as “Authors” & the same assignment may be submitted by both. However, there cannot be more than 2 authors.

*Due date for submission – Sat (25-March) 10 PM*

The matlab file c1p8.mat (uploaded on Moodle) contains data collected and provided by Rob de Ruyter van Steveninck from a fly H1 neuron responding to an approximate white-noise visual motion stimulus. *Note: We haven’t yet discussed White noise stimulus in class. However, treat it as some time varying stimulus, at the moment.*

Data were collected for 20 minutes at a sampling rate of 500Hz*. Important note: Only 1 trial was carried out in the experiment. Hence, you cannot carry out trial average here. Just calculate average for spikes in a single trial.*

In the file

* ‘rho’ is a vector that gives the sequence of spiking events or nonevents at the sampled times (every 2 ms). When an element of rho is one, this indicates the presence of a spike at the corresponding time, whereas a zero value indicates no spike.
* The variable ‘stim’ gives the sequence of stimulus values at the sampled times.

Do the following :

1. Write a MATLAB code for calculating the Spike-triggered average from this data.
2. Calculate and plot the spike-triggered average from this data over the range from 2 sec  to 114 sec. Comment on the nature of STA plot.

Upload on Moodle, the STA plot along with comments in a single file & the matlab code in another .m file

(Based on a problem from Sebastian Seung)