

Q1

Calculate the Fano factor of the spike count and coefficient of variation of the inter-spike interval for 1000 seconds of spike train with a firing rate of 35 Hz, both with no refractory period and with a refractory period of 5 ms. In the case of the Fano factor the count should be performed over windows of width 10 ms, 50 ms and 100 ms.

no refractory period		
coefficient	0.9983232248627073	
Fano_factor	10ms	0.999659626037596
	50ms	1.0036608252274866
	100ms	1.0019019054682374

refractory period of 5 ms		
coefficient	0.8205591367612264	
Fano_factor	10ms	0.7469554948175495
	50ms	0.6939142055942071
	100ms	0.6930960528184013

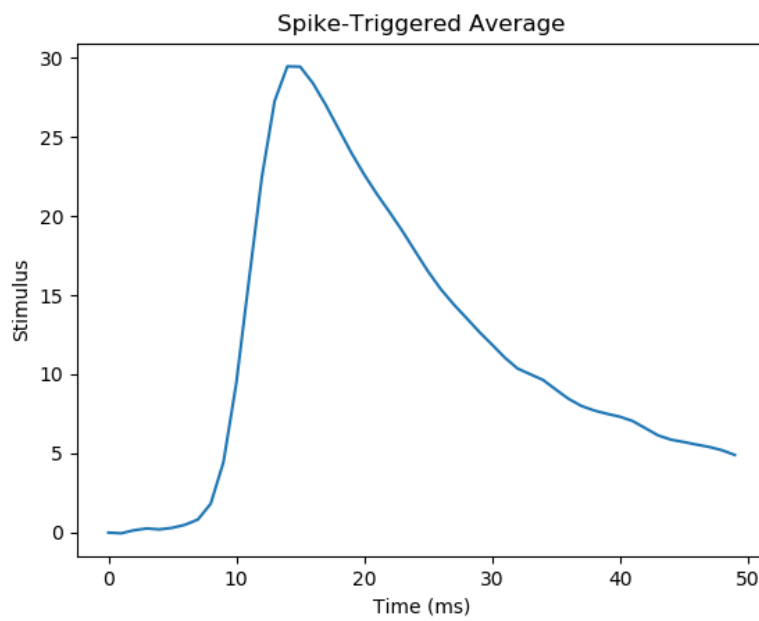
Q2

Data were collected for 20 minutes at a sampling rate of 500 Hz. Rho is a vector that gives the sequence of spiking events or non-events at the sampled time, that is, every 2 ms. Calculate the Fano factor and coefficient of variation for this spike train as for the simulated spike trains of rho.

collected for 20 minutes at a sampling rate of 500 Hz.		
coefficient	2.0085125289465235	
Fano_factor	10ms	1.117680142627936
	50ms	2.9297562848640877
	100ms	4.102959520344769

Q3

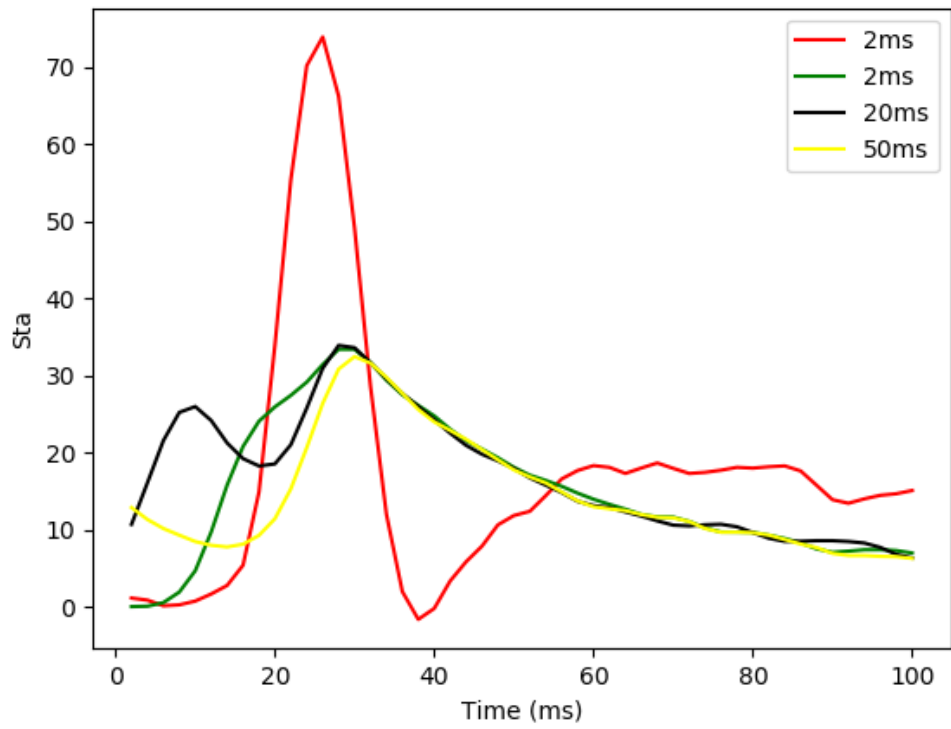
Calculate and plot the spike triggered average over a 100 ms window



Q4

Calculate the stimulus triggered by pairs of spikes, that is for intervals of 2 ms, 10 ms, 20 ms and 50 ms calculate the average stimulus before a pair of spikes separated by that interval; do this for both the case where the spikes are not necessarily adjacent and the case where they are.

spikes are not necessarily adjacent



spikes are adjacent

