Coursework 2 - Spike Trains

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Question 1

Fano Factor of the spike count for 1000 seconds of Poisson train with a firing rate of 35 Hz:

- With a 0ms refractory period and a spike count performed over 10ms windows: $F = 1.000$.

- With a 0ms refractory period and a spike count performed over 50ms windows: $F = 0.999$.

- With a 0ms refractory period and a spike count performed over 100ms windows: $F = 0.997$.

- With a 5ms refractory period and a spike count performed over 10ms windows: $F = 0.749$.

- With a 5ms refractory period and a spike count performed over 50ms windows: $F = 0.700$.

- With a 5ms refractory period and a spike count performed over 100ms windows: $F = 0.692$.

Coefficient of variation of the inter-spike interval for 1000 seconds of Poisson train with a firing rate of 35 Hz:

- With a 0ms refractory period: $CV = 1.001$.

- With a 5ms refractory period: $CV = 0.825$.

`github.com/COMS30127`

Question 2

Fano Factor of the spike count for 20 minutes of spike train with a sampling rate of 500 Hz:

- With a spike count performed over 10ms windows: $F = 1.116$.

- With a spike count performed over 50ms windows: $F = 2.931$.

- With a spike count performed over 100ms windows: $F = 4.103$.

Coefficient of variation of the inter-spike interval for 20 minutes of spike train with a sampling rate of 500 Hz: $CV = 2.009$.

Question 3

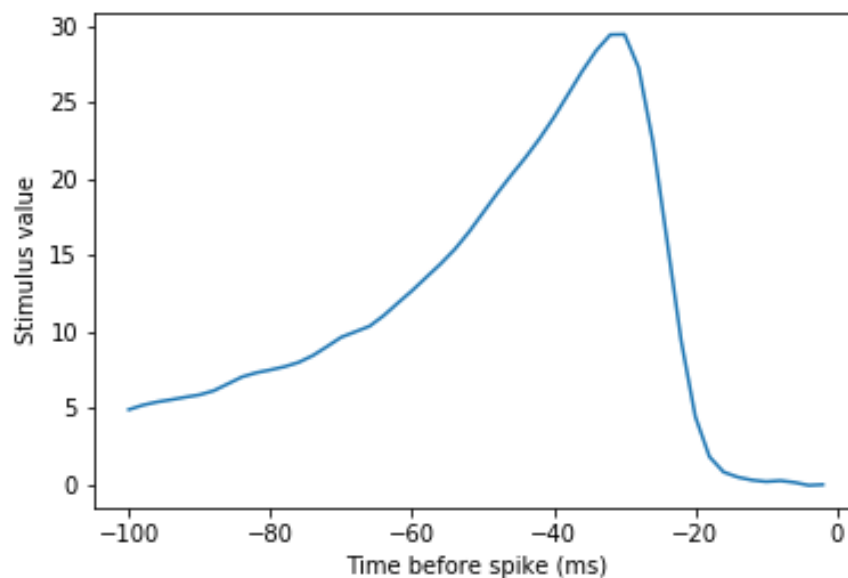Figure 1 is a line graph showing the spike-triggered average of 20 minutes of spike train data over a 100ms window.

Figure 1