Sebastian Oakes – Computational Neuroscience Coursework 2

Q1) All done for 1000s of spike time, firing rate of 35Hz

Spike trains with zero refractory period

Bin size = 10ms

Fano factor =   1.0019232026672056

coefficient of variation =

0.9988039889270792

Bin size = 50ms

Fano factor =   0.9991372602463154

coefficient of variation =   1.0009683593511125

Bin size = 100ms

Fano factor =   1.0067486747810261

coefficient of variation =   1.0033609815319007

Spike trains with 5ms refractory period

Bin size = 10ms

Fano factor =   0.7472530066630444 coefficient

of variation =   0.8217687476808799

Bin size = 50ms

Fano factor =   0.687211038961039

coefficient of variation =   0.8210689667744108

Bin size = 100ms

Fano factor =   0.6912649428074279

coefficient of variation =   0.8286690001450328

Q2)

Bin size = 10ms

    Fano factor =   1.1176428298912333

    coefficient of variation =   2.008552337063215

Bin size = 50ms

    Fano factor =   2.9282637753959806

    coefficient of variation =   2.008552337063215

Bin size = 100ms

    Fano factor =   4.10213864013731

    coefficient of variation =   2.008552337063215

Q3) Spike triggered average for a 100ms window, with
the x axis denoting the number of seconds before
thespike event. Average of -36ms for optimal spike
triggering.

Spike Triggered Average - 100ms window