Single Network with stimulated neurons

*%Parameter Definition*

set inhibitory and excitatory neuron parameters

set network parameters

set stimulation amplitude

set simulation timestep and duration

*%Create Network*

Position excitatory and inhibitory neurons around a ring, where radius is proportional to network size

**While** set excitatory and inhibitory input has not been reached

**for** each postsynaptic neuron

Select a set of possible presynaptic neurons

**for** each selected neuron

**if** neuron is excitatory

**if** dice roll is < *e*-distance between neurons / critical excitatory distance

create connection

**else if** neuron is inhibitory

**if** dice roll < *e*-distance between neurons / critical inhibitory distance

create connection

set neuron self-connectivity to zero

%*Run Simulation*

**for** selected number of stimulated neurons

randomly select set of stimulated neurons

create stimulation input at a single time step

**for** each time step

Neuron input = connectivity matrix \* neuronal firing rates

Determine neuronal firing rate on next time step based on current firing rate, thresholded response to input, and stimulation

Coupled Network with Noise

*%Parameter Definition*

set inhibitory and excitatory neuron parameters

set network parameters

set number of neurons for large network

set number of neurons for small network

set weight of connections between large and small network

set Poisson noise event amplitude and frequency

*%Create Large Network*

Same steps as in Single Network Creation

*%Create Small Network*

Same steps as in Single Network Creation

*%Create Combined, Coupled Network*

**while** weight of replaced connections < weight of connections between large and small network

randomly select a neuron and an input synapse

**if** synapse is excitatory

remove the synapse

randomly select an excitatory neuron in the other network and make a new synapse

increment weight of replaced connections

%*Run Simulation*

create Poisson noise events for each neuron

**for** each time step

Neuron input = connectivity matrix \* neuronal firing rates

Determine neuronal firing rate on next time step based on current firing rate, thresholded response to input, and stimulation by Poisson noise