CN 530: Neural and Computational Models of Vision

## Simulation Assignment 4

### Traveling "G-waves"

Consider item 1 of simulation assignment 2 (distant-dependent network). By using the same equation, generate a travelling G-wave.

**Note:** You need to numerically solve the differential equation. The easiest way is to estimate the temporal dynamics by: $x_i(t+\Delta t) = x_i(t) + \Delta t * dx_i/dt$, where the term $dx_i/dt$ is directly obtained from the distance-dependent shunting equation of simulation assignment 2, item 1.

Choose temporary inputs to nodes $k$ and $l$ ($1<k<l<n$ , where $n$ is the total number of nodes). The duration of inputs $I_k$ and $I_l$ is $m*\Delta t$ and SOA (stimulus onset asynchrony, or here, input onset asynchrony) is $T$.

You are going to figure out practical $m$, $n$, $T$, $\Delta t$, dt (as well as kernels $C_{ki}$, $E_{ki}$ ) to generate a "traveling" G-wave. In fact you have a full control over the selection of any parameter to make the simulation work.

Provide snap-shots of your network dynamics to show the spatial profile of the wave in different moments, and describe the reason that led you to select the particular set of parameters in your final simulation. Also provide snap-shots of your network dynamics when just one of $I_k$ or $I_l$ is presented to the network.