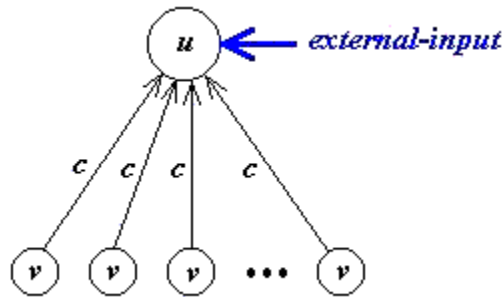


## Activation Update Algorithm for Jets-and-Sharks Network

Parameters:

$\alpha$	external input scale factor (0.4)
$\beta$	excitation scale factor (0.1)
$\gamma$	inhibition scale factor (0.1)
MINIMUM	minimum allowable unit activation (-0.2)
MAXIMUM	maximum allowable unit activation (1.0)
DECAY	activation decay factor (0.1)
RESTING	resting activation level of a unit (-0.1)



**To compute the activation change for unit  $u$ , do the following:**

```

set excitation and inhibition to 0
for each incoming connection  $c$  from unit  $v$  {
  # ignore connections from units with negative activation
  if  $\text{activation}(v) > 0$  {
    # accumulate incoming activation
    if  $c$  is excitatory
      add  $\text{activation}(v) \times \text{strength}(c)$  to excitation
    else
      add  $\text{activation}(v) \times \text{strength}(c)$  to inhibition
  }
}
# compute total incoming activation to unit  $u$ 
set totalInput to  $\alpha \times \text{externalInput} + \beta \times \text{excitation} + \gamma \times \text{inhibition}$ 
# compute scaled input to unit  $u$ 
if totalInput > 0
  set scaledInput to  $(\text{MAXIMUM} - \text{activation}) \times \text{totalInput}$ 
else
  set scaledInput to  $(\text{activation} - \text{MINIMUM}) \times \text{totalInput}$ 
# compute activation change
set activationChange to scaledInput -  $\text{DECAY} \times (\text{activation} - \text{RESTING})$ 

```

**To update the activation of unit  $u$ , do the following:**

```

add activationChange to activation
# keep activation within bounds
if  $\text{activation} > \text{MAXIMUM}$  set activation to  $\text{MAXIMUM}$ 
if  $\text{activation} < \text{MINIMUM}$  set activation to  $\text{MINIMUM}$ 

```