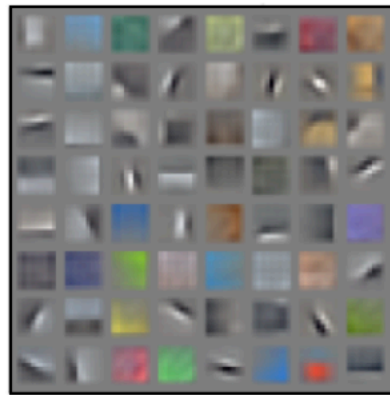




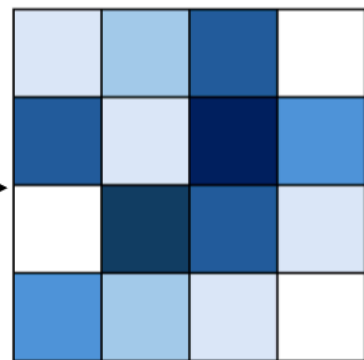
Image Input
 x



Dictionary
 D

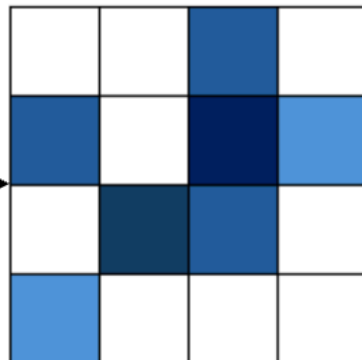
Input Drive
 $b(t)$

+



Membrane Potentials
 $u(t)$

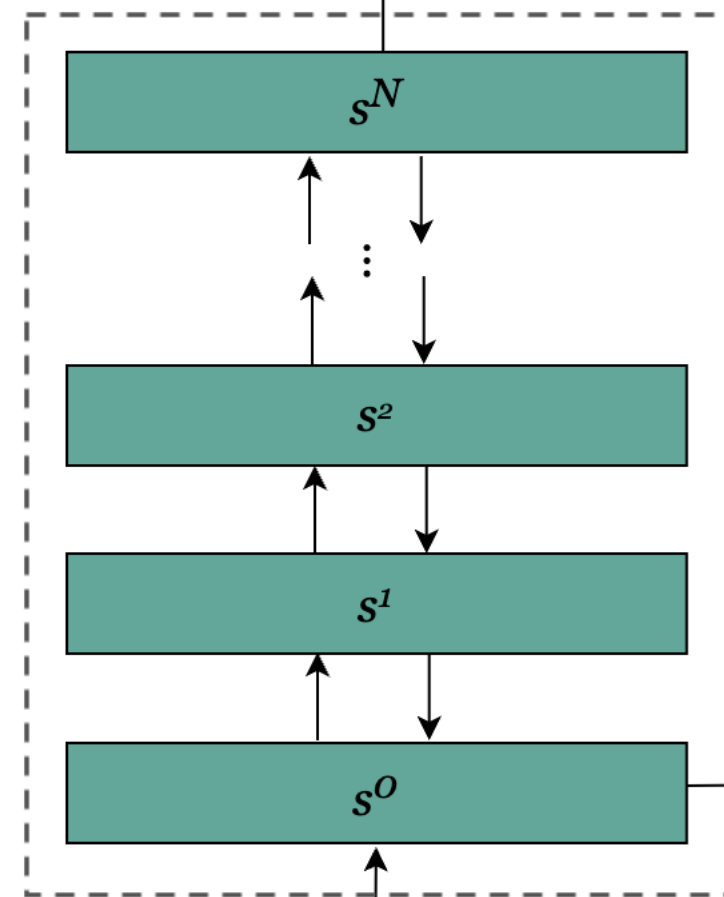
$\Gamma_\lambda(u(t))$



Sparse Activations
 $a(t)$

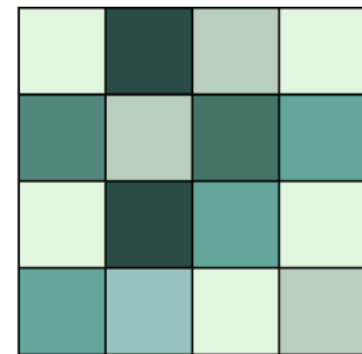
$$y = \text{softmax}(w_{out} \cdot s)$$

b)



$$x = a(t), t = T_{LCA}$$

Energy Based RCNN

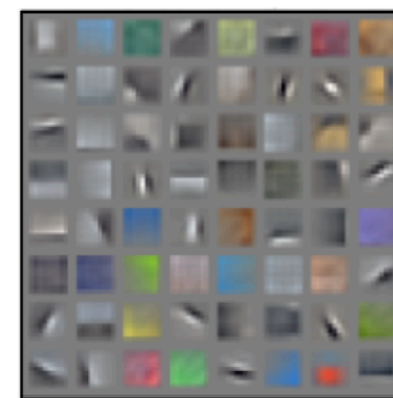


Nudged States

s^β, o_*

$\Gamma_\lambda(s^\beta, o_*)$

c)



Tuned Dictionary
 D^*

a)

$$u(t+1) = u(t) + \frac{1}{\tau} [b(t) - u(t) - a(t)\Phi^T\Phi + a(t)]$$

$$a(t) = \Gamma_\lambda(u(t)) \quad \text{for } t = 1 \dots T_{LCA}$$

Lateral Competition
 $- a(t) D^T D + a(t)$