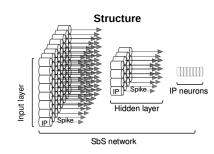
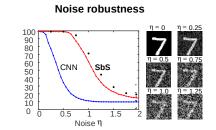
## Spike-by-Spike Neural Network





## Properties:

## Noise robustness

Iterative optimization

No sign bit required

Requires division

Compute and memory intensive

## Neuron update

$$h_{\mu}^{new}(i) = \frac{1}{1+\epsilon} \left( h_{\mu}(i) + \epsilon \frac{h_{\mu}(i)W(s_t|i)}{\sum_j h_{\mu}(j)W(s_t|j)} \right)$$

Non-negativity 
$$0 \le W(s_t|j) \le 1$$

Normalized 
$$\sum_{s_t=0}^{M-1} W(s_t|j) = 1$$