Perceptrons —

23 Mar 1990 McCulloch Pitts — neuron

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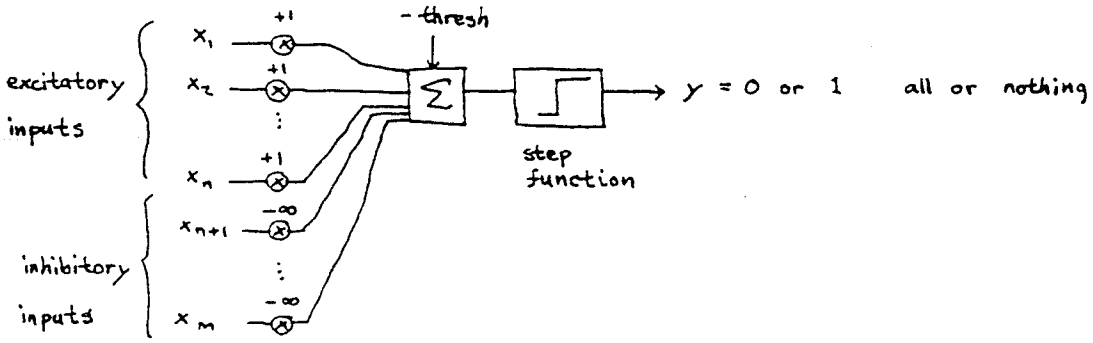
McCulloch, W. S. and Pitts, W. "A logical calculus of the ideas immanent in nervous activity" Bull. Math. Biophys., vol 5, pp 115-133, 1943

- Defined neuron as threshold logic device
- Showed neural network could compute arbitrary Boolean expressions
- Showed neural network is Turing equivalent, i.e. can compute any program that a digital computer can compute. (Network may have to be arbitrarily large.)
- Pointed out that synapse modification not necessary for learning.

neuron:



- inputs = 0 or 1
- if any inhibitory input active then neuron turns off
- output active (i.e. = 1) when # excitatory inputs active is > thresh

Can connect neurons in layers or circles or both: