Summary of McCulloch and Pitts (1943) "A logical Calculus of the ideas immanent in nervous activity"

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1 Brief statement of the problem addressed in the paper

Using a simplified model of neurons and their connections McCulloch and Pitts showed that the behavior of every neural net that lacks circles can be modeled with the means of propositional logic. The paper shows that it is possible to simulate any logical proposition with the right network. Theoretically this means that whatever can be computed can also be calculated with the right network.

2 What I liked about the paper

After struggling with the notation, the only aspect of the paper that I can claim to enjoy and understand is the optimism that is portrayed in the final section towards how much this will allow scientific rigor into psychology.

3 What I did not like about the paper

Inhibitory signals in McCulloch and Pitts act to negate all effects of the inputs and commandeer the output of the neuron.(Section 2 4th bullet) That is practically equivalent to stating any inhibitory signal causes the entire neuron to give up entirely. The oversimplification of the neuron to only active or passive states doesn't mean that inhibitory signals should be moved to kill all switches. By adding a threshold to the model inhibitory signals could be accounted for without loss of generality. (This might be addressed in Theorem 4 and 5 in the paper and I may be misunderstanding it)

4 Inspirations from the paper

While each neuron in the net is inherently simple in terms of IO when networked together they give rise to any sort of combination of IOs.
Anything that can be computed with a computer can also be computed with a net.