

## Summary:

The activity of neurons can be described as an all or nothing state. This allows them to be represented by propositional logic. The basic structure of a neuron is an axon and a soma and they have a threshold at which excitation happens. Neurons can inhibit or excite other neurons. They begin to build the intuition of layers and to formalize a neural network structure. They also discuss sequential neural systems vs recurrent neural systems.

### 1. The Problem:

The problem that this paper addresses is that neural networks have hard to define characteristics. How do neurophysiology tie into the neural interactions? How can such be modelled? The paper addresses these and shows mathematical models to represent them including in complex cases such as recurrent neural networks.

### 2. What I liked and Why:

I feel like this is kinda a grand daddy paper for the whole of the neural network field. It shows the mathematical representation at the heart of neural networks. It begins to split up the neurons into input, middle, and output neurons. It shows that logical patterns exist and can be utilized to have neural networks simulate other logical circuits.

### 3. What I did not like:

I can't say anything was particularly "not liked". If I had to pick something, it is his assumptions in the concluding paragraph. He states several things such as hallucinations and attributes them purely to alterations in our brains neural network. But such could be spawned by our eyes or muscle or bone related issues and might not be purely nerve related. He also states that the neural net being known allows for knowledge and quality and form. This is entering into a philosophical realm beyond that of his paper. Is knowledge inherent the brain or is it the reality of existence which is unbiased though seen through the distorted lense of the neural net of our brain? It seems a stretch to suppose a knowledge of the brain makes something more real than a lack there of. Real is real regardless

of observation. It is only the observation and perspective that changes.

#### 4. Inspirations found in the paper

I do feel it important to understand neural networks to understand my own brain. To relate thought patterns to an enormous recursive neural network allows for control and directing of thought patterns - essentially self training in the most effective way possible.