Analysis of “A logical calculus of the ideas immanent in Nervous Activity”

Preamble

This was a hard paper to read. I had to read it twice before I was able to grasp what the authors were trying to convey. I feel like it would have been easier to understand if I was reading it in the 1940’s.

A brief statement of the problems addressed in the paper in my own words.

I don’t feel like the authors were trying to address problems in the paper, but rather present a new way to think about and approach neurological activity. To me it seemed as if the authors presented a new way to model intelligent thinking. They presented their theory with its 5 assumptions (1)All or none, (2)Excitation within the period of latent addition, (3)Synaptic delay is negligible, (4)Inhibition prevents excitation, and (5)Structure does not change over time. They then proceeded to justify a calculus that could “model/replicate” any net.

What I agree with/like in the paper and why.

I really like how they presented their ideas and justification for their ideas. They referred often to established facts about how neurons, axons, and inhibitors come into play. The clearly discussed areas that could cause concern like synaptic delay and how it could be thought to be negligible. They then provided all the mathematical proofs for their theory. Honestly I understood very little of the proofs. I mainly walked away with the idea that you can model propositions, or as I thought of them “Logic Gates” using Artificial Nueral Nets. It was intriguing to read how learning and extinction could be modeled through net substitution. I was impressed with how much they used proofs to justify their theory. It seemed as if they came up with this new way of thinking, and then to justify it they had to provide proof that any neural net could be modeled and substituted in as needed.

What I disagree with/dislike in the paper and why.

How can I talk about something I disagree with or dislike when I have the perspective of looking back nearly 80 years to their work? Cautiously, I would say they were too gung-ho on the idea of the structure of the net not changing. It seemed like this was something hard to conceptualize and was hardly worth working through let alone discussing. Keep in mind that this was written right after the death of Sigmund Freud and his work was a very forward thinking. The authors must have had access to his work and research and perhaps ignored it to say something so bold as the net structure is static. It also may have been something like what side of the fence are you going to come down on? They might have just lucked out and picked the wrong side.

Any inspirations I found in the paper.

I was inspired by how succinctly they were able to get their point across. Reading it myself, even though I had to read it twice to grasp at what they were trying to lay down, it is very well written. I really liked the structure of the paper. The first part used knowledge that was common in neurological study. They then presented their ideas and showed the ramifications of those ideas. Finally they presented their proofs such as to justify their theory. Honestly, the way they laid the groundwork for much that has followed is impressive. Their main ideas are still being used and built upon to this day, well done!