

# Review of: "The functional unit of neural circuits and its relations to eventual sentience of artificial intelligence systems"

Yu Feng<sup>1</sup>

<sup>1</sup> Duke University

Potential competing interests: No potential competing interests to declare.

The author tries to develop theories for a group of neuronal functional units by combining logic and feedback units. And they state that these functional units are essential for the emergence of an electromagnetic field. There are several critical questions that need to be addressed to strengthen the credibility and validity of the proposed theories.

1. The author incorporates feedback loops in their proposed neuronal functional units, arguing that these loops can precisely return error signals. However, it is necessary to ascertain whether such feedback loops indeed widely exist in the brain. The paper lacks empirical evidence supporting the widespread presence of these feedback loops. To reinforce their claims, the author should draw upon existing neuroscience literature and provide experimental findings demonstrating feedback loops' prevalence and significance in the brain's neural networks.

2. The author states that self-awareness comes from the feedback connection. However, the author falls short of providing compelling evidence to support this claim. It is well known that the brain learns new knowledge through Hebbian-like learning rules without the requirement of a feedback loop. The author should offer a more in-depth explanation of their reasoning.

3. The author further states that self-awareness could possibly exist in a large language model since the backpropagation loop. However, this conclusion hinges on the author satisfactorily demonstrating the vital role of feedback loops in self-awareness. To support this claim, the author should present a clear and convincing argument connecting the functioning of feedback loops in neuronal functional units to the emergence of self-awareness.