

Diseased Learning Machines

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Abstract

In this note the authors propose that vector ephaptic perceptrons be viewed as an implementation of multiple sclerosis in the learning machine framework.

In [1], Chawla introduced the vector ephaptic perceptron. Its properties were studied in Section 4 of [2]. It was found to not perform up-to-the-mark as compared to the regular perceptron in linear classification tasks. This was interpreted as a negative result. However, if we view ephaptic coupling as a model that occurs in multiple sclerosis and other neurodegenerative conditions that couple axons which are not usually coupled, then this result can be seen as a step towards modeling and simulation of 'diseased neural networks.'

Whereas Koch and Tononi [3] recently argue that artificial intelligence is distinct from artificial consciousness and whereas we proposed ephaptic synchronization as a step towards conscious devices in [4], nevertheless there is definite overlap between intelligence and consciousness. The study of diseased learning machines can help in defining the boundaries where learning machines approach (as models) living systems.

In this sense, the study of AI systems based on ephaptic effects will be relevant for modeling 'psychosomatic conditions' in these systems. For example, questions such as: how does a 'psychotic' LLM respond to a scenario as compared to a healthy one, will help in understanding psychotic conditions in man as well. This will advance the diagnosis and treatment of these conditions.

References

- [1] Aman Chawla. A mathematical model for the vector ephaptic perceptron. *Zenodo*, 2022.
- [2] Aman Chawla. Network random refresh.
- [3] Graham Findlay, William Marshall, Larissa Albantakis, Isaac David, William GP Mayner, Christof Koch, and Giulio Tononi. Dissociating artificial intelligence from artificial consciousness. *arXiv preprint arXiv:2412.04571*, 2024.
- [4] Aman Chawla. Some thoughts on cosmic-conscious devices. 2024.