



2-1 Discussion: Human Brains and Neural Networks

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Joel De Alba posted Jul 23, 2023 1:45 AM [Subscribed](#)

Hello fellow classmates,

In this module we learned a lot about the complexities of Artificial Intelligence, Machine Learning, Deep Learning, and other terminologies involved with the practices of utilizing circuits, machinery, software, etc. to imitate or inhibit human behavior and learn as humans do. From such introductions we also learned about Artificial neural networks and biological neural networks and there are so many commonalities in the way that they operate.

ANNs and BNNs are both very intricate systems that process complex tasks the differences are based on the strength of the input and output terms. A brain records and stores data based on the amount of neurons, synapses and how closely grouped they are. Decisions are based on how strongly they are interpreted or received and what the expected output is. In machine learning we utilize activation functions, weights, and biases, to process input and output data to achieve a calculated percentage value of approximation to 0 or 1 based on the methods of implementation.

The human brain works similarly as a computer does as it fires random electrical impulses based on the input received, then determines the next desired action or probability that is the outcome. In ANNs, artificial neurons (also known as nodes) perform similar computations, where weighted inputs are summed and passed through an activation function.

Humans have the ability to learn from relatively few examples, generalize knowledge to new situations, and understand abstract concepts. Human learning involves cognitive processes such as reasoning, critical thinking, and creativity, which are still challenging for machines to replicate. In contrast, machine learning, including neural networks, relies heavily on data-driven approaches. ANNs learn through large-scale datasets and optimization algorithms, adjusting their

internal parameters (weights and biases) to minimize errors and improve performance on specific tasks. While they can excel at specific tasks with sufficient data, they often lack the flexibility and generalization capabilities of human intelligence.

In summary, while artificial neural networks are inspired by biological neural networks and share some basic principles, they are far simpler and less flexible compared to the complexity and adaptability of the human brain. Human intelligence is a product of not only the neural connections but also the intricate interplay of cognitive processes that enable creativity, abstract thinking, and quick adaptation to new situations. Machine learning, including neural networks, excels in certain tasks given large datasets, but it currently falls short in replicating the full spectrum of human intelligence and cognitive abilities.

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