NEURAL NETWORK ZOO

INTRODUCTION TO NEURAL NETWORKS

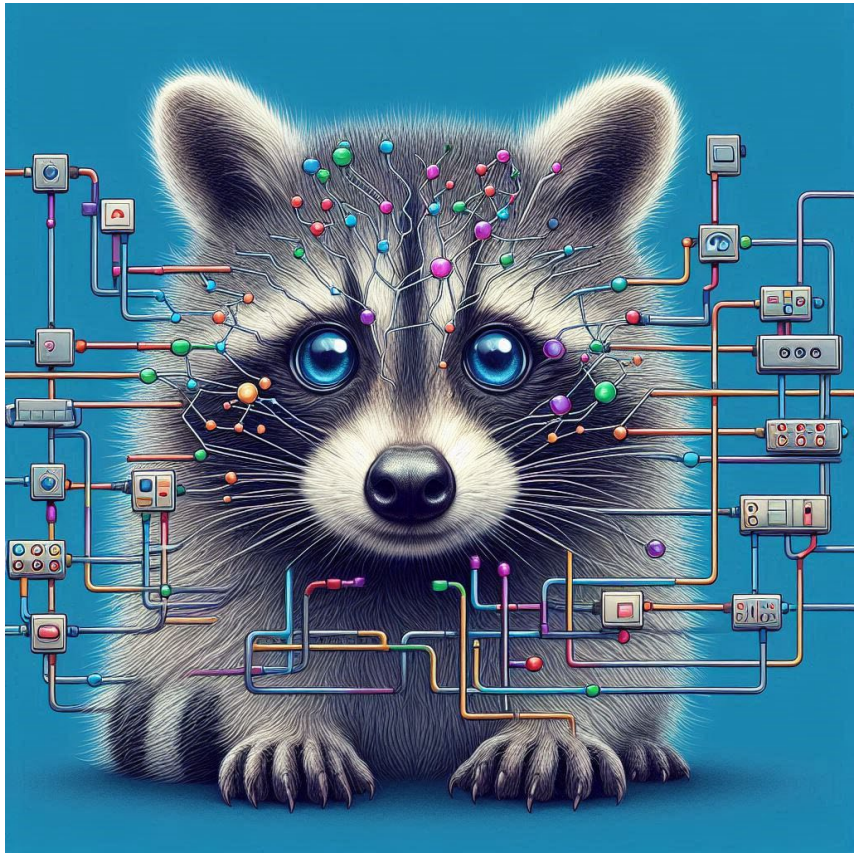
AI enables machines to perform human-like tasks. Machine learning (ML) is a subfield of AI that allows machines to learn from data (Houston Community College AI Department).

ARTIFICIAL NEURONS

Neural networks (NN) are ML models that are the fundamental building blocks of deep learning. It is modeled after the way biological neurons of the brain work together in an interconnected network of artificial neurons.

NEURAL NETWORK “ZOO”

RECURRENT NEURAL NETWORK (RNNS) RACOON



Recurrent Neural Networks (RNNs) process information similarly to traditional neural networks by moving data forward. However, they also incorporate feedback at each step though back feeding, which allows them to retain information from previous inputs. This ability to understand context enables RNNs to make improved prediction (GeeksForGeeks, 2025).

LONG SHORT-TERM MEMORY NETWORK (LSTM) LEMUR

LSTM networks are a type of RNN that are capable of learning order dependence in a sequence. They address the issue of keeping the neural network unchanged, as typically in RNNs, signal are weakened during the transition matrix.

- Makes “Remembering” Easy
- By ‘Remembering’ the info from the last step
- Augmented RNNs with additional Gate Units: Input, Forget, Output Gate Units

CONVOLUTIONAL NEURAL NETWORK (CNNS) CHEETAH

CNNs are a type of advanced neural network that is designed for feature extraction from grid matrices.

A convolution is the operation of comparing a small neural network layer to small parts of the total image or dataset.

This is done until the full image is compared to the convolutional layer resulting in feature extraction.

Layers Used For CNN

- Input Layer
- Convolutional Layers
- Activation Layer
- Pooling Layer
- Flattening
- Fully Connected Layers
- Output Layers

Typical Applications of CNNs

- Computer Vision applications, such as object detection, image classification, and facial recognition.
- Video Analysis
- Medical Image Analysis
- Autonomous Systems

CNN CHEETAHS CONTINUED

REFERENCES

- Long-Short Term Memory (LSTM) Networks - Recurrent Neural Networks and Long-Short Term Memory Networks | Coursera
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- Neural Networks Basics Powerpoint

THANK YOU

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