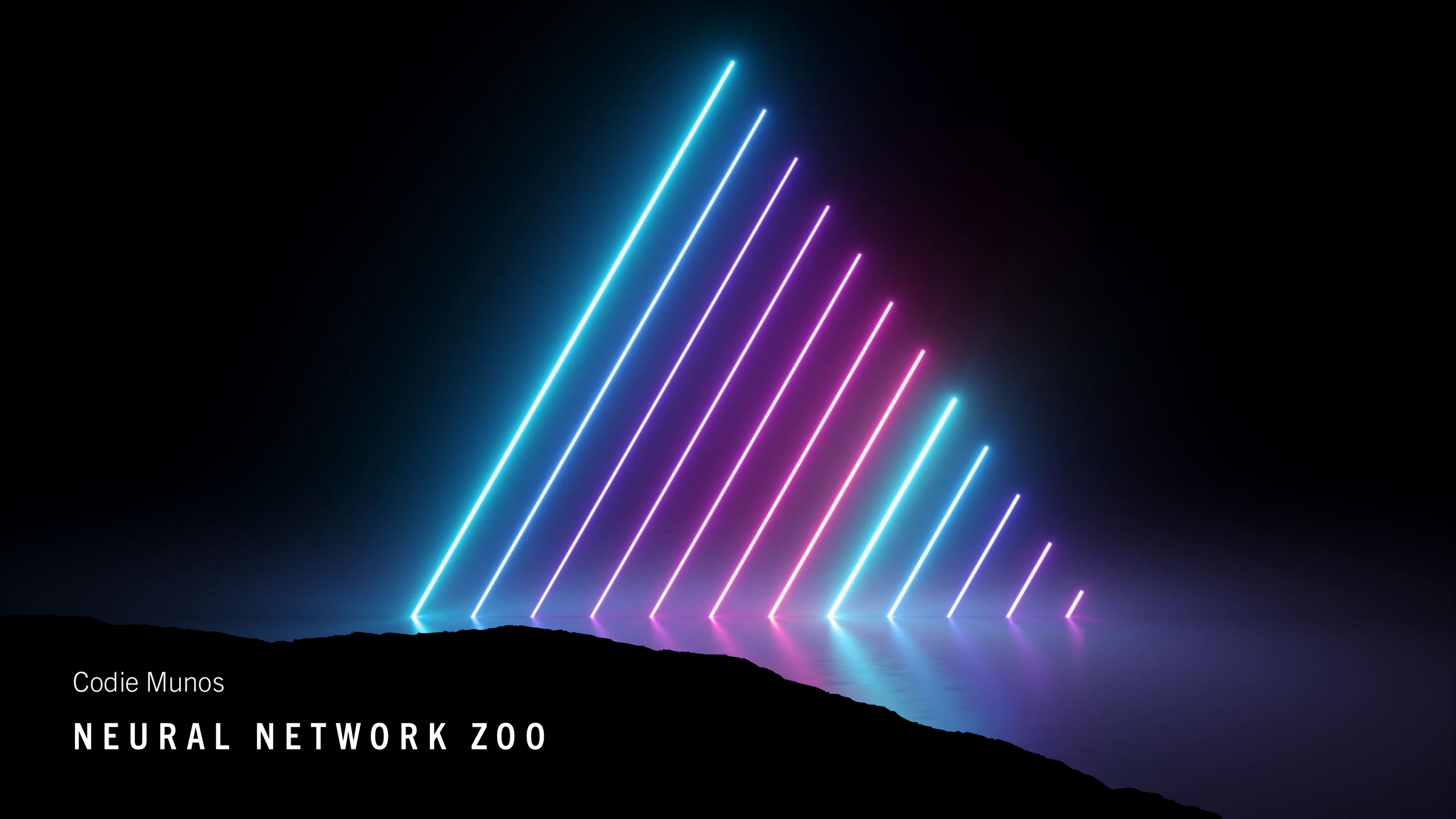


Codie Munos

NEURAL NETWORK ZOO

NEURAL NETWORKS AND DEEP LEARNING

Neural networks are made to be in comparison to that of a human brain. Essentially it is a machine learning program that is about to come to conclusions based on the training data provided. They have to be fine tuned before being deployed in AI!

Deep learning uses these neural networks to power the decision-making that mimics the human brain. This is similar to the original machine learning, but different in the means of structure. Deep learning utlizes more layers and can operate from unsupervised learning.

NEURONS

- Also referred to as nodes
- The layers that make up a neuron consists of: Input, Synaptic Weight, Activation Function, and Output
- Types of Neural Networks: Convolutional Neurons, Feedforwarded Neurons, and Recurrent Neurons
- Organization: Due to neurons being connected to other neurons, the different layers essentially have a bridge to cross over into the next.

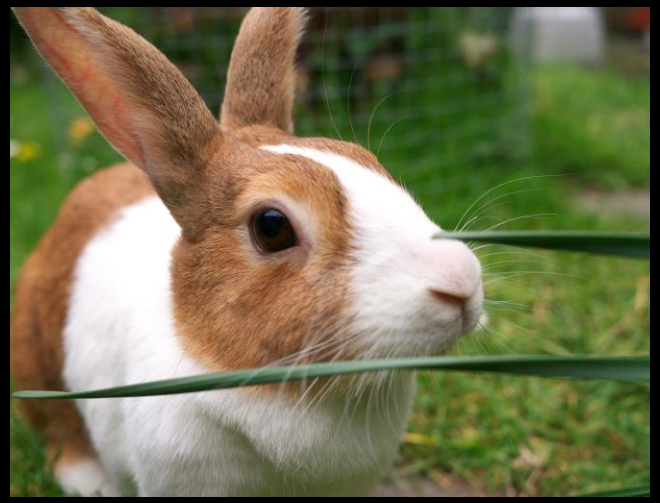
NEURAL NETWORK ZOO ANIMALS:

Convolutional Neural Network:

KING COBRA

Recurrent Neural Network:

RABBIT



Long Short- Term Memory:

LION

TRAITS OF THE NEURAL NETWORK ZOO ANIMAL:KING COBRA

- King Cobra:
  - The longest venomous snake in the world!
  - They have eleven scales on the top of their head!
  - They eat other snakes! Gross!
  - Humans hunt them for sources of food, medical needs, and leather production.

TRAITS OF THE NEURAL NETWORK ZOO ANIMAL: RABBIT

- Their teeth will always continue to grow!
- They have short gestation period of 30 days and reproduce at extremely high rate!
- Rather than regulating body temperatures with outer sweat glands, rabbits use other parts of their body to help cool down such as their long ears and their breathing.
- They are really unique and almost have a 360-degree visual of their surroundings! That is pretty interesting!
- Their sense of smell is impressive and contributes to them fleeing danger before it reaches them!

TRAITS OF THE NEURAL NETWORK ZOO ANIMAL: LION

- "A pride of lions" refers to a group of lions!
- Their food sources range in size from big to small, and when I say big, I mean big!!! Phew!
- The females do the hunting while the lions protect the tribe.

CONVOLUTIONAL NEURAL NETWORK

- CNN's are used more in computer vision than most other applications.
- Image/video datasets benefit more from these neural networks
- They are very expensive in terms of training and space for memory.
- They can absorb large datasets and deliver accurate results.
- The layers that make up the network include:
  - Input layer, convolutional layer, activation layer, pooling layer, flattening, fully connected layers, and output layer.

RECURRENT NEURAL NETWORK:

- They remember past information and use these patterns to make predictions about what is coming next.
- RNN's have a hidden state which is heldm in the recurrent unit. This is what helps it to remember.
- They are different from other neural networks because the weight matrices are shared across different time steps which also helps in the remembering process.

LONG SHORT-TERM MEMORY

- These types of neural networks push the boundaries even further for recurrent neural networks.
- They have a larger ranger of time-steps than traditional RNN's
- There are three gates which include the input, forget, and output gates.
- The hidden state found in this neural network is more for a short-term memory holding spot.

REFLECTION

- This activity has gave me more insight into the different capabilities of three different types of neural networks.
- Convolutional Neural Networks were different that the others as it is more successful for computer vision projects.
- RNN's and long short-term memory neural networks are similar, but different with it comes to their hidden state.
- Long short-term memory is better suited for applications such as Siri while RNN's cannot keep up with as many long term functions that Siri applications require,