micron STEM

Artificial Intelligence Neural Networks Presentation

Reviewed 2026

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Artificial Intelligence Neural Networks

This activity is an adaption from an activity originally developed by AI4ALL, and used with their permission https://ai-4-all.org/

Activity guide provided separately on Micron Educator Hub

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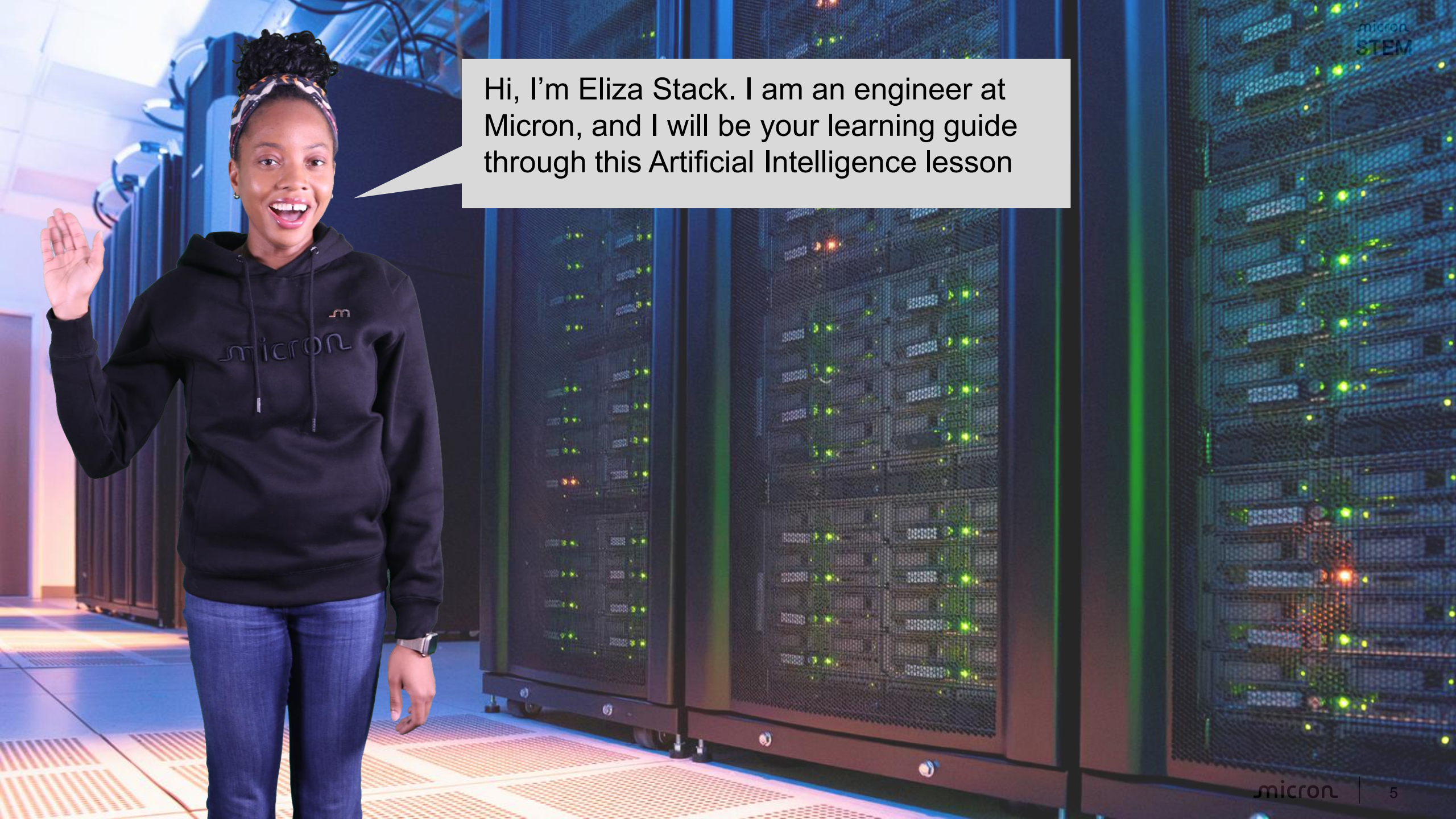
Hi, I’m Eliza Stack. I am an engineer at Micron, and I will be your learning guide through this Artificial Intelligence lesson

What will we learn today?

- What is Artificial Intelligence?
- What is Machine Learning?
- What is a Neural Network?
- Become a Human Neural Network!

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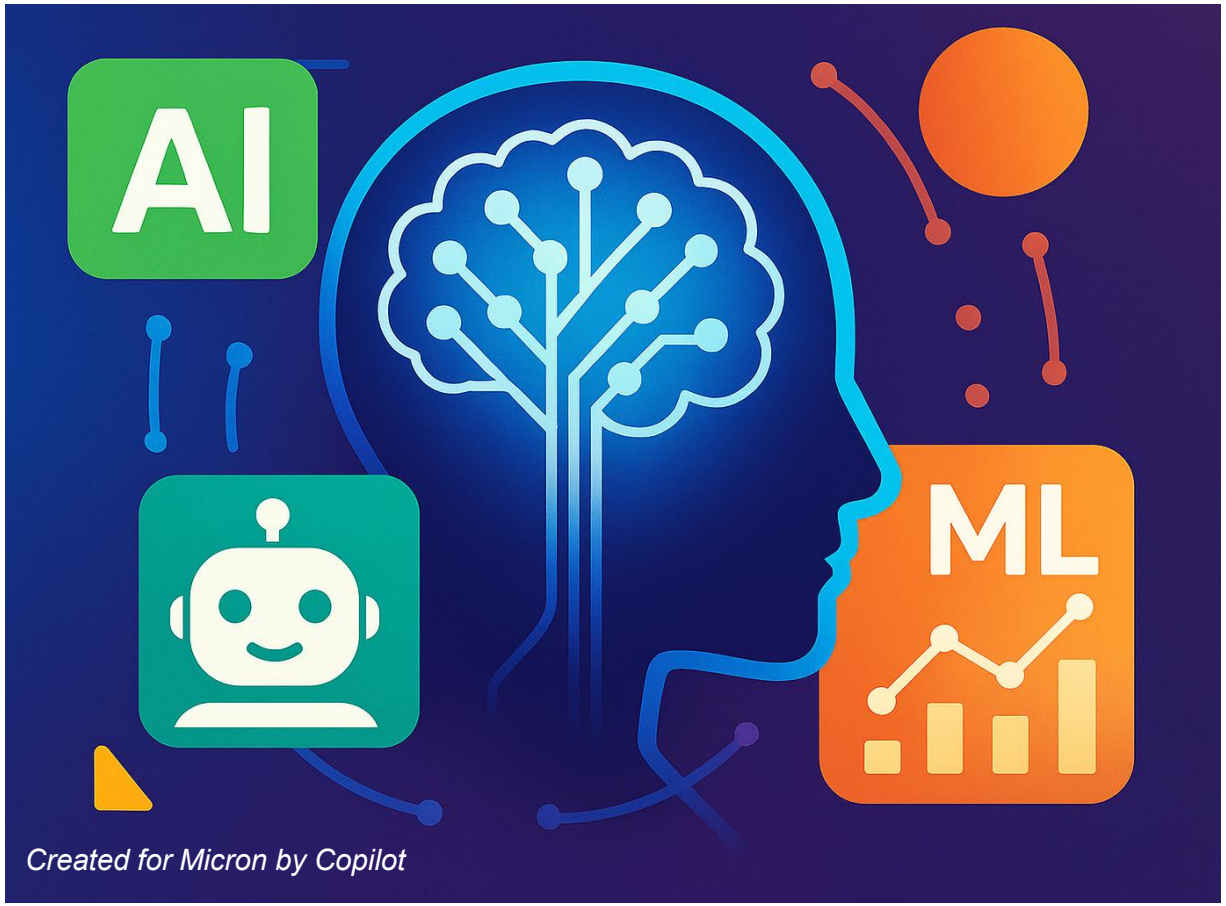
Artificial Intelligence (AI)

Definition of AI
AI is a computer science field creating systems that perform tasks needing human-like intelligence such as learning and reasoning.

Learning and Adaptability
AI systems can learn from experience and adapt over time, unlike traditional explicitly coded programs.

AI Technologies
AI combines methods like machine learning, neural networks, and natural language processing to analyze data and give insights.

Impact on Society
AI influences many fields including healthcare, education, entertainment, and transportation, shaping the modern world.



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Computer Science (CS)

Definition of CS
Computer science is the study of how computers work and how we can use them to solve problems. Computer science involves studying algorithms, data structures, programming languages, and hardware architecture.

Beyond Coding
It includes problem-solving, logical reasoning, and designing efficient computational systems.

Foundation for AI
Computer science provides the foundation that makes AI and machine learning possible.

Career and Innovation
Learning computer science opens doors to technology careers and fosters creativity and critical thinking.

Understanding computer science and programming does support someone to better understand how artificial intelligence works! Studying computer science can explain the inner workings of AI.

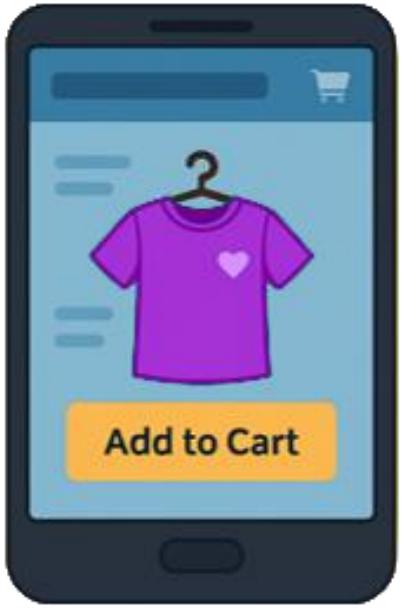
Examples of AI in everyday life

Weather Forecasting
AI analyzes complex data to provide accurate weather predictions, helping people plan their daily activities.

Language Translation Apps
AI enables real-time text and speech translation, facilitating smooth communication across languages.

Healthcare / Medical
AI supports disease diagnosis and treatment recommendations by analyzing patient medical data.

Social Media
AI sorts through millions of pieces of content to decide what to show on individual social feeds as well as detect and filter out harmful content.



Online Retail
AI personalizes shopping experiences and manages inventory.

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Machine Learning (ML)

Definition of ML

A type of AI that uses data to teach computers how to learn to make predictions and decisions. Computer learning takes place through recognition of patterns from data, similar to how humans learn from examples.

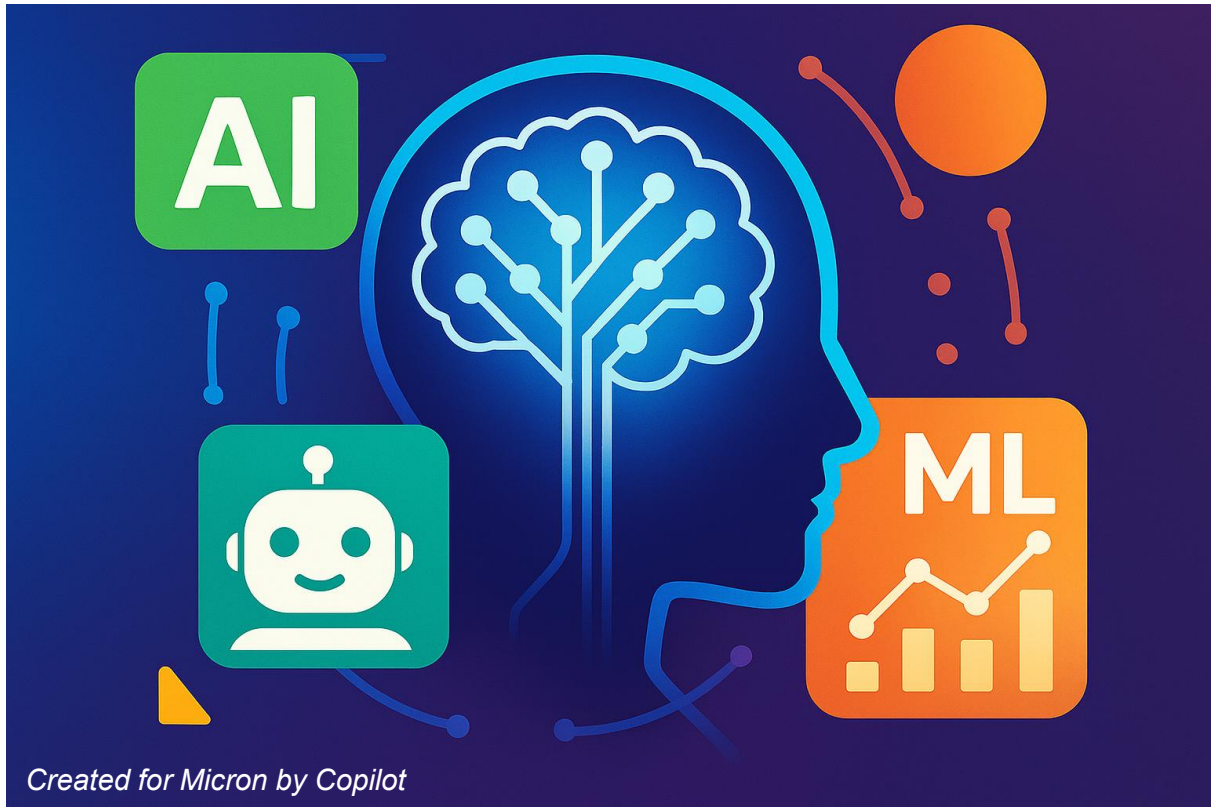
Learning and Adaptability

There are 3 main ways computers learn:

- **Supervised Learning:** computer is given examples with correct answers—like studying with an answer key
- **Unsupervised Learning:** computer is not told the correct answers. It looks for groups/patterns on its own.
- **Reinforcement Learning:** The computer learns through trial and error, receiving feedback—similar to learning a sport or video game.

Real-Life Examples

Spam filters, movies/music suggestions, self-driving cars, voice assistants, etc.



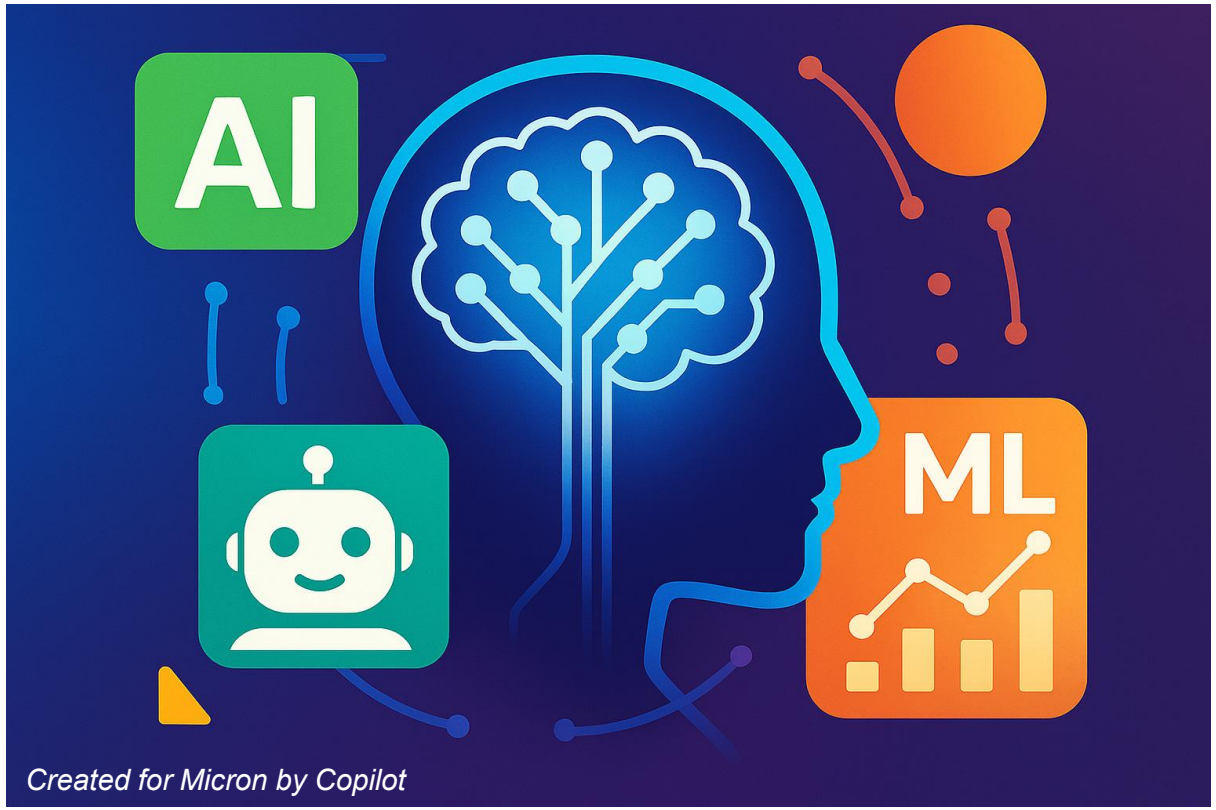
Computer Programming vs Machine Learning

What is a programming language?
A programming language is a way of giving a computer step-by-step instructions to solve a problem.

How is machine learning different from programming?
Programming and machine learning take two very different approaches:

Programming: You tell the computer exactly what to do, step by step.

Machine Learning: Instead of giving exact rules, you train a model using examples so it can handle problems that don't have clear, simple instructions—like recognizing objects in photos or understanding spoken words.



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Do Machines Really Learn?

Not the way humans learn.

Machine “learning” is all based on mathematics and statistics.

Machines don’t understand meaning — they adjust math based on data.

So, the difference is that humans learn by gaining understanding and insight through experience and a machine learns as it practices a specific task.

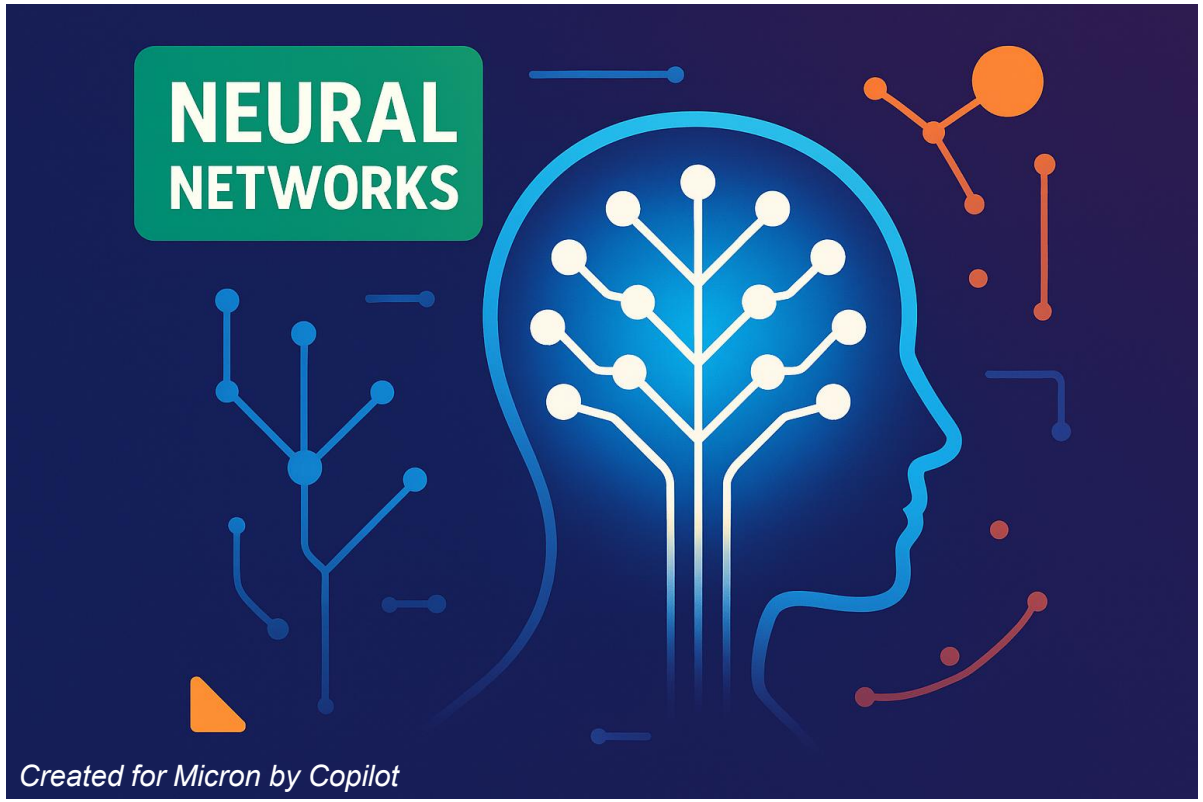
Neural Network

Definition of Neural Network
A type of ML inspired by the human brain. Uses a collection of connected nodes to make predictions and update themselves as data is introduced to the system.

Brain-Inspired Structure
Neural networks mimic the brain's neurons and connections, forming layers of interconnected nodes.

Learning and Adaptability
Neural networks learn complex patterns by processing data through layers and improving via training.

Applications of Neural Networks in AI
Used in image recognition, language processing, and predictive analytics across many industries.



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Neural Network

Is NOT like the brain…
Because Neural Networks are based on math. All data is translated into numbers.

Is like the brain…
Because Neural Networks use connected nodes, which can be compared to the brain's connected neurons.

Because the Network learns and improves through training called 'backpropagation'.

Neural Network Applications
Tasks like speech recognition and image classification are specialties due to learning through complex patterns and generalizing to new data.

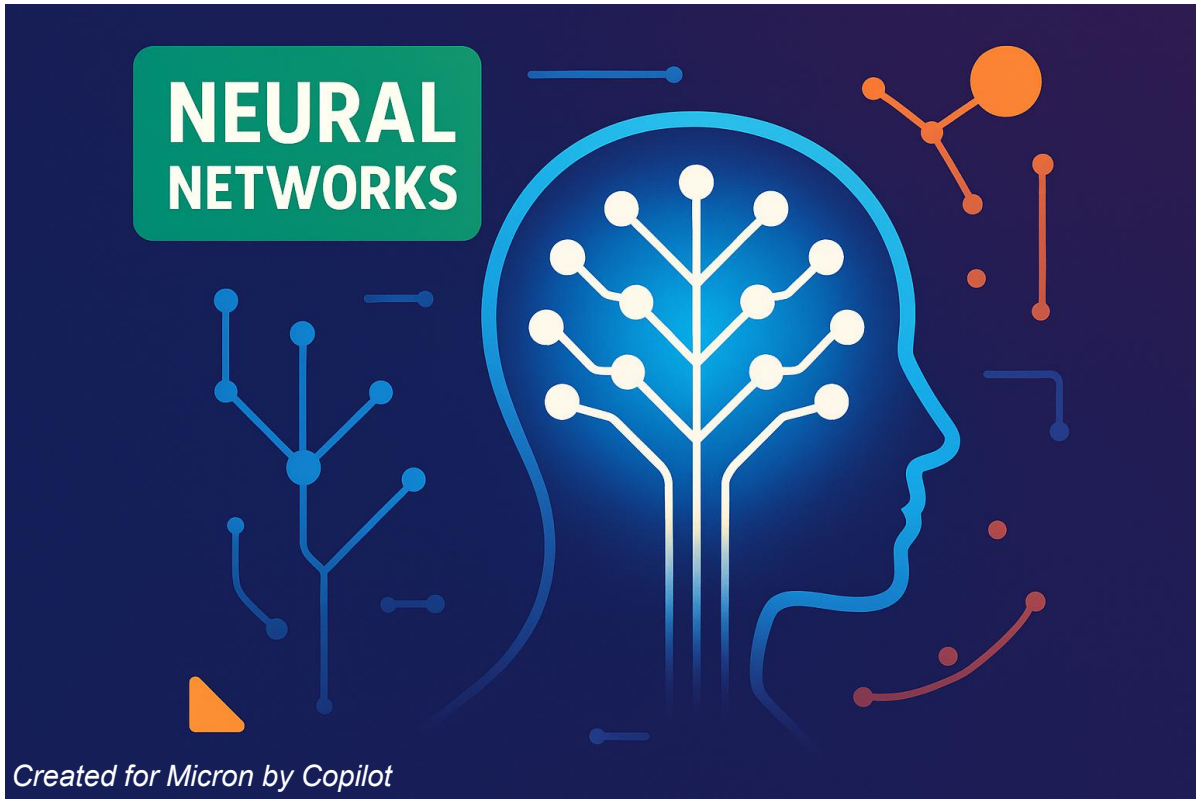
Remember:
All digital information becomes zeros and ones—like flipping thousands of tiny light switches on and off to create every picture, word, and sound. This is true for AI and ML and Neural Networks.

Where Neural Networks Are Useful

Pattern Recognition
Neural networks excel at recognizing complex patterns in large datasets, enabling image and speech recognition.

Healthcare Applications
Neural networks assist in diagnosing diseases by analyzing medical images and patient data for better healthcare outcomes.

Finance and Fraud Detection
Neural networks help detect fraudulent transactions and predict market trends, improving security and financial forecasting.



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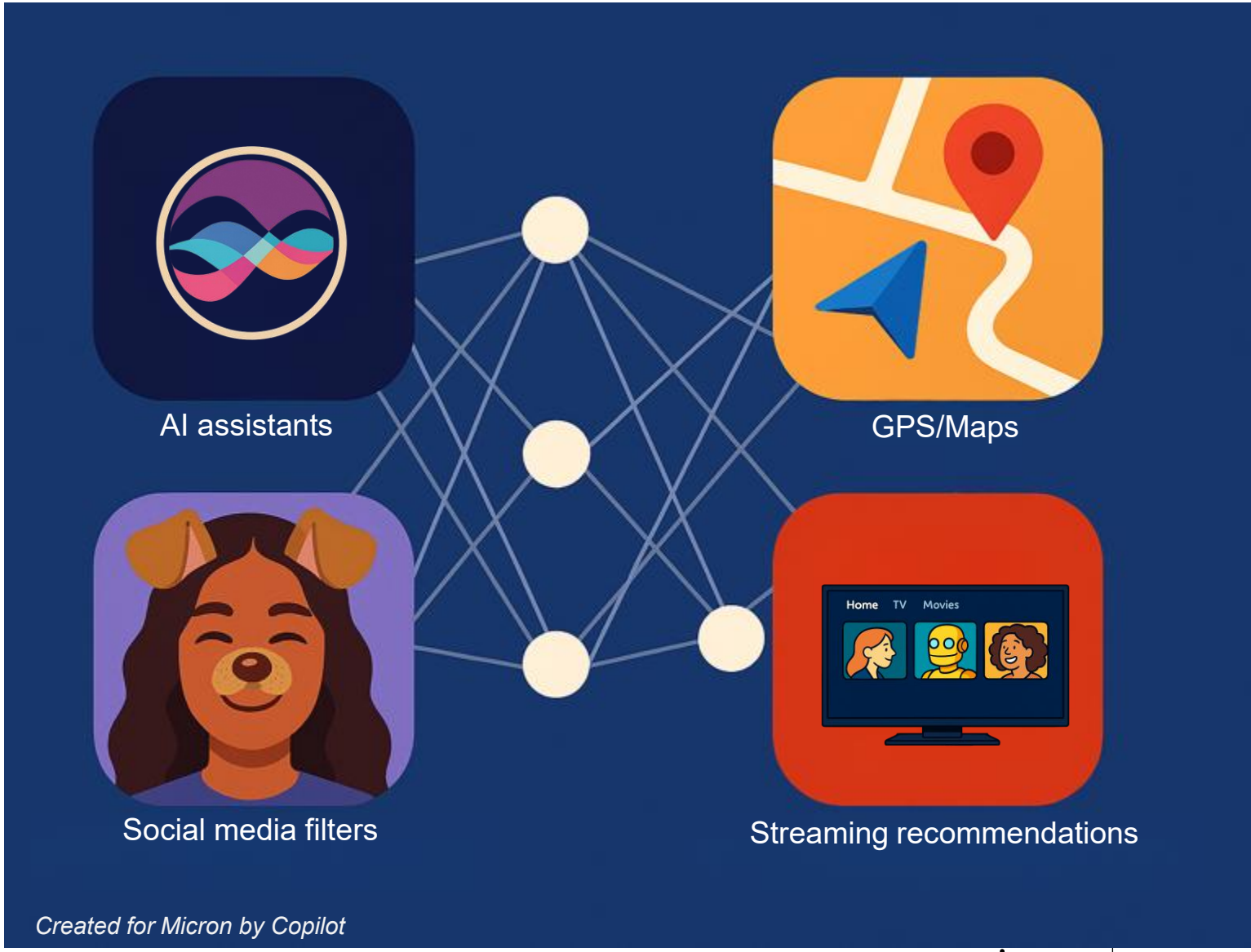
Customer Support Chatbots
Neural networks understand user queries and generate helpful, conversational responses.

Artificial Intelligence and Neural Networks

Artificial Intelligence and Neural Networks are used daily and made possible by powerful computing with access to large amounts of data in the cloud and shared over the internet.

Micron memory and storage are used to power AI applications.

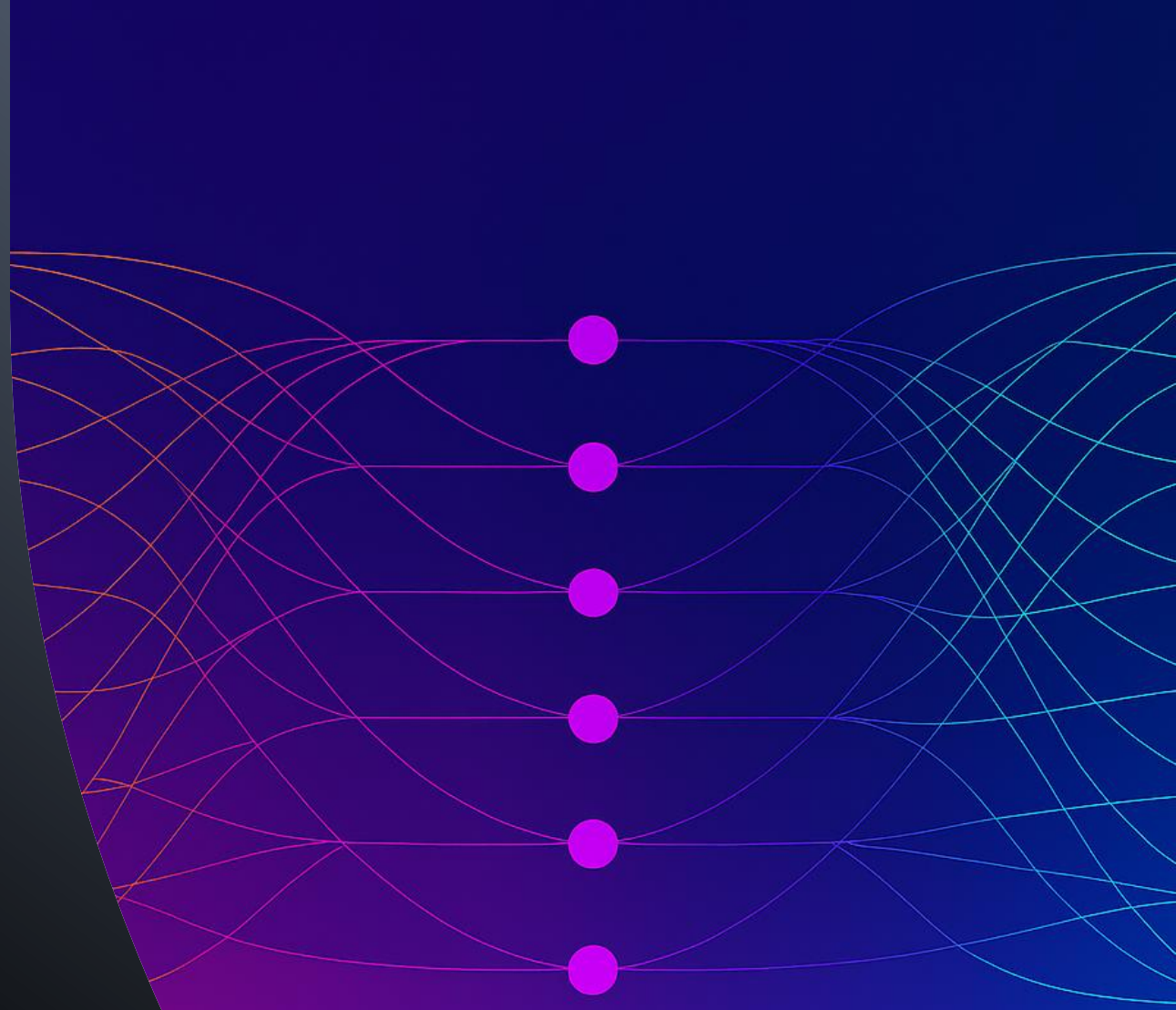


Neural Network Explained

Input Neurons

Hidden Neurons

Output Neurons



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Neural Network Explained

Human Vision and Computer Image Recognition

HUMAN

Visual Input Neuron Role

Each input neuron receives raw visual image to transfer to hidden neurons in the brain.

Hidden Neuron Role

Each hidden neuron processes and interprets different features based on the raw visual image from the input neurons.

Output Neuron Role

Sends the answer to the brain based on all inputs from hidden neurons.

COMPUTER

Input Node Function

Receives raw data like image pixels or numerical features to initiate processing.

Hidden Node Function

Perform computations applying weights and activation functions to extract features.

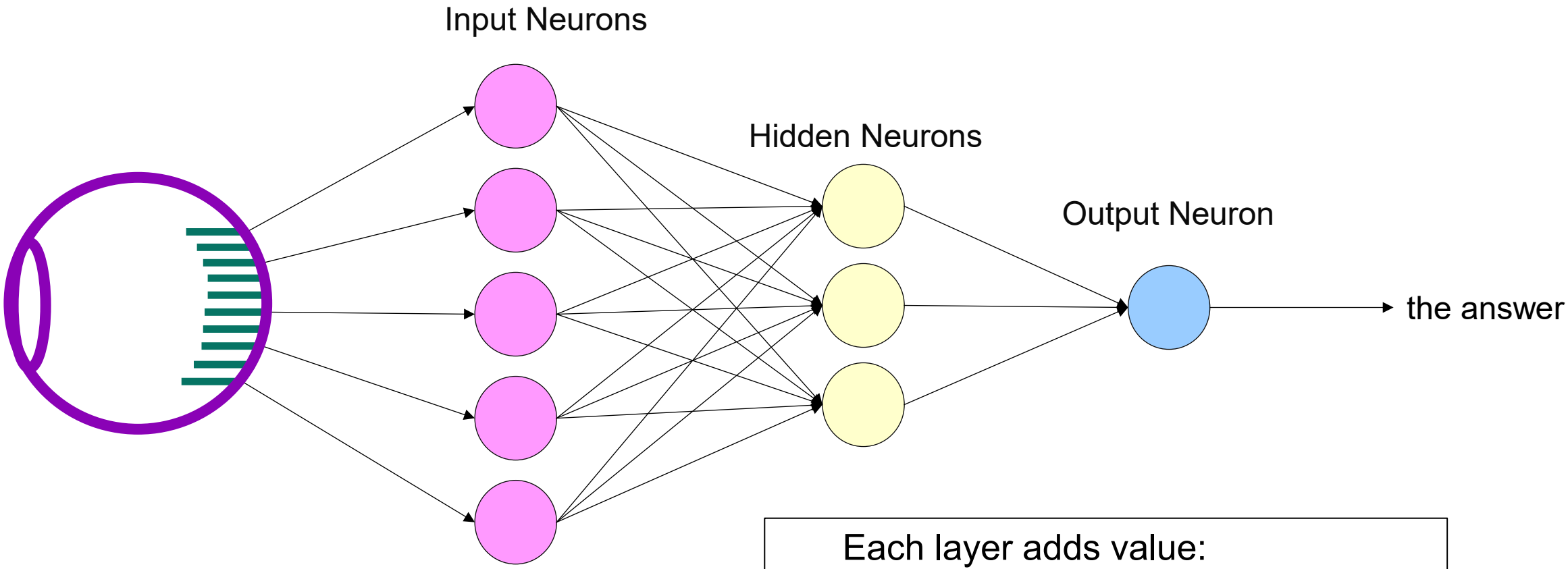
Output Node Function

Produces final prediction or classification based on processed data from hidden layers.

Deep Neural Networks Power

Many hidden node layers capture hierarchical patterns for complex data and abstract learning.

Human Vision: A Network of Neurons



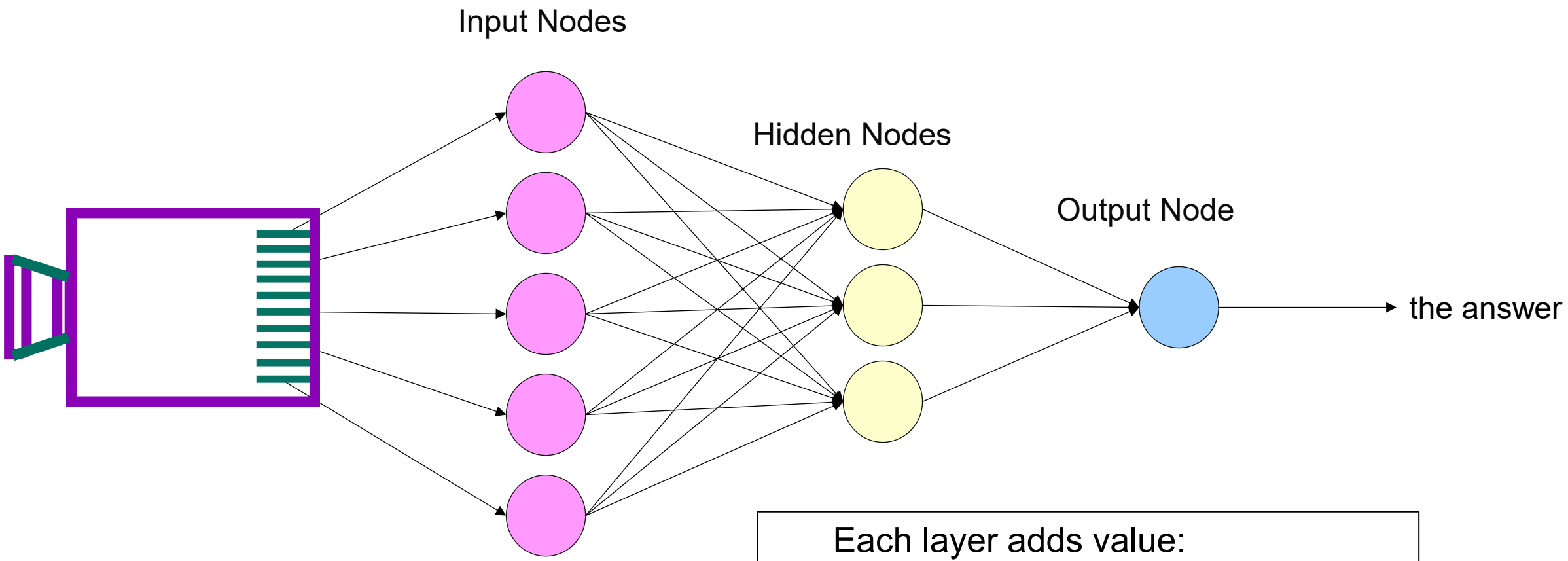
Each layer adds value:

Input Neurons: Very basic info

Hidden Neurons: Interpret basic info

Output Neuron: Sends “the answer”

Computer Vision: A Network of Nodes



Each layer adds value:
- Input Nodes: Very basic info
- Hidden Nodes: Interpret basic info
- Output Node: Sends “the answer”

Using Math to Simulate Neurons

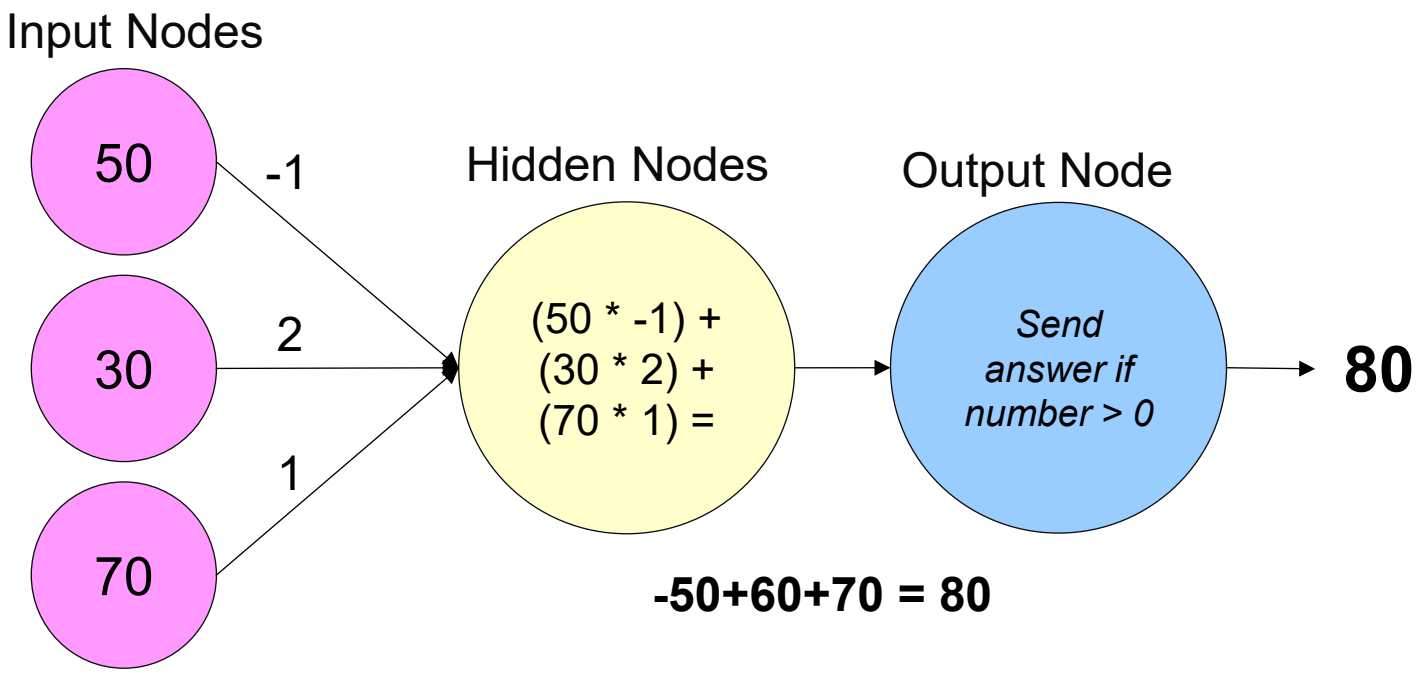
Basic addition and multiplication

(Sensor Value * Sensor Weight) + (Sensor Value * Sensor Weight)…

Training changes weights

unhelpful sensors get lower weight
machine change values and tries again
called “Back Propagation”

NOTE: This is a simplified illustration.
Real neural networks use many more inputs and more complex math not explored further for this activity.

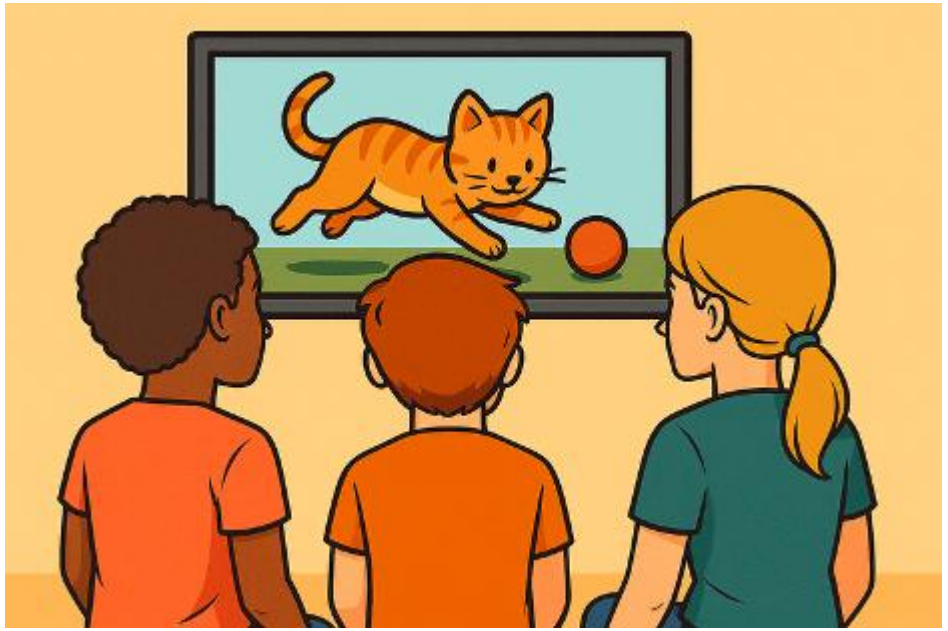


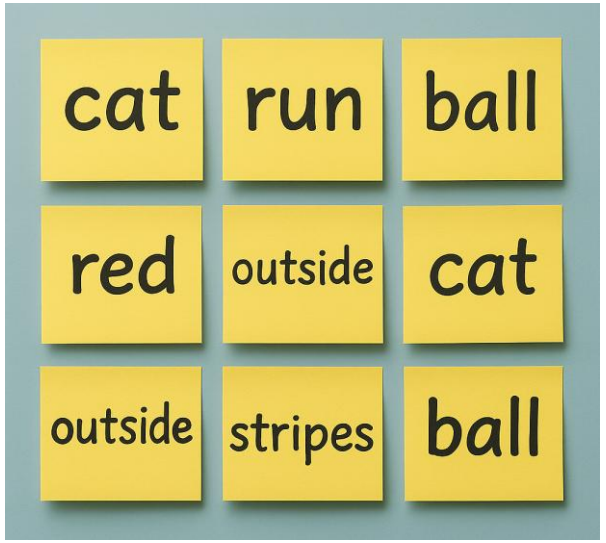
Human Neural Network Game

Input Neurons – given a photo – write one word about it on a note – gives one note to each Hidden Neuron

Hidden Neurons – gets one note from each Input Neuron – write two words on one note – gives note to Output Neuron

Output Neuron – gets one note from each Hidden Neuron – write a descriptive phrase based on what is on the notes





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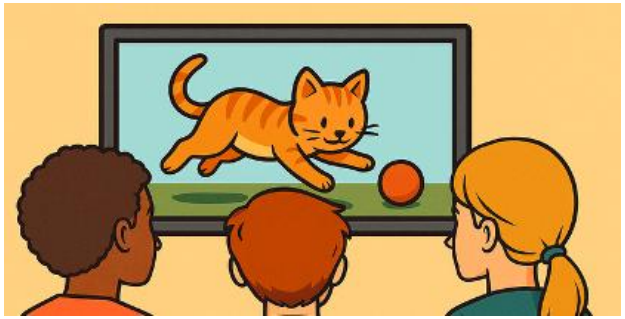
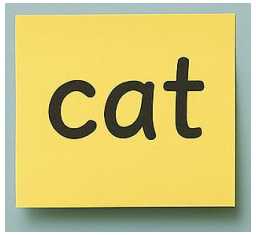
Human Neural Network Game

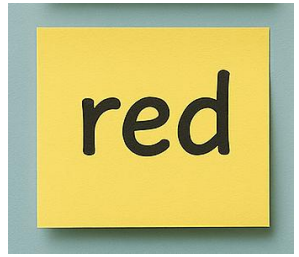


Input Neurons

- Only you will see the photo
- No communicating with other Input Neurons
- Write one word about the photo on a note
- Words can be all the same or different
- The number of notes must match the number of Hidden Neurons
- Give one note to each Hidden Neuron

Those of you playing the role of Input Neuron are the only ones that get to see the picture!





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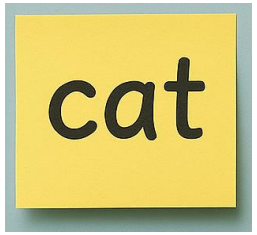
Human Neural Network Game



Hidden Neurons

- Receive one note from each Input Neuron
- No communicating with other Neurons
- Read each note
- Consider each word
- Write two words on one note
- Give note to the Output Neuron

Remember: No talking!

Those of you playing the role of Hidden Neuron only need to create ONE note.

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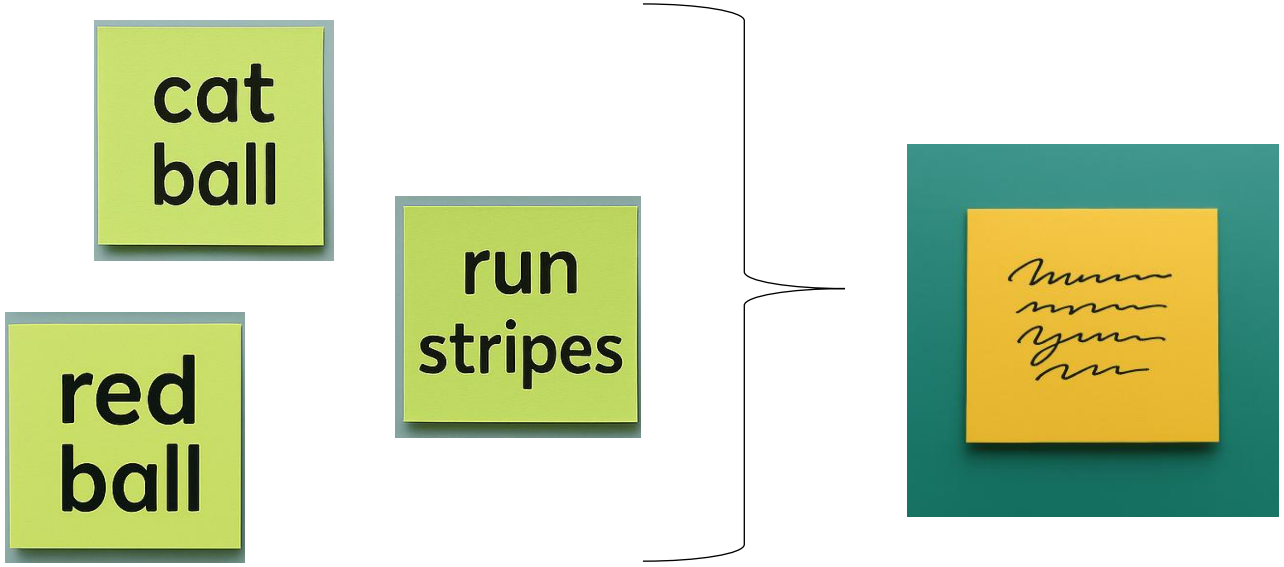
Human Neural Network Game

Output Neuron

- Receive one note from each Hidden Neuron
- Consider all the notes
- Write a descriptive phrase based on the notes received



Those of you playing the role of Output Neuron get creative!

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Human Neural Network Game

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