

# A04 - Deep Learning for an 11-year-old

ITAI 2376 - Deep Learning in Artificial Intelligence  
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# Backpropagation in AI

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- **Backpropagation** (short for **backward propagation of errors**) is a key learning algorithm used in **Artificial Intelligence (AI)**, especially in **neural networks** and **deep learning**.



# Backpropagation in AI

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Backpropagation is:

- a. How neural networks **learn from data**
- b. What allows AI to **improve over time**
- c. Used in tasks like image recognition, language translation, speech recognition, and more

# Working of Backpropagation (Step-by-Step):

- **Forward Pass:** The AI looks at the input (like a photo) and makes a guess (like “dog”).
- **Calculate Error:** It checks how wrong the guess is by comparing it to the correct answer (like “cat”).
- **Backward Pass (Backpropagation):** The AI sends the error backward through the network, layer by layer, figuring out which parts of its brain (called **neurons**) were most responsible for the mistake.
- **Update Weights:** Using that information, the AI adjusts the **weights** (like learning knobs) so it can do better next time.

# Backpropagation for an 11-Year-Old

## Theme

- **Story with Sketch**

## Story Title

- **Brainy the Robot Learns from Mistakes**

# Brainy the Robot Learns from Mistakes!

**Brainy** – A robot who wants to learn how to recognize animals.



**The Error Monster** – A little creature that tells Brainy how wrong his guesses are.



**Miss Dotty** – The wise teacher who helps Brainy learn.



**Magic Wires** – The connections between Brainy's robot brain cells.





# Story Time.....

Brainy, a robot who wants to be super smart.

One day, Miss Dotty shows him a picture of a cat and asks:  
*'What animal is this, Brainy?'*

Brainy says: *'Hmm... is it a dog?'*

Miss Dotty: Oops! That's wrong."

The **Error Monster** pops out and says: *'Brainy! You got it wrong by 0/10!'*

# Story Time.....

Brainy has **Magic Wires** connecting his thinking parts. They're like paths from one idea to another.

When he makes a mistake, the Error Monster sends a message backward through the wires."

Miss Dotty explains: *"Brainy, this is called backpropagation! It means the mistake travels back through your brain wires to tell each part how to do better next time!"*

Brainy learns by making guesses, getting feedback, and fixing his brain wires a little each time.



The background of the slide is a dark blue to purple gradient. It features several concentric circles of varying thicknesses and colors (white, light blue, and dark blue). There are also small white dots scattered across the background, resembling a starry field or a network of nodes.

# Thank you

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