

Lesson Plan

- Lesson 1.1: Neural Networks
- Lesson 1.2: Image Recognition Training**
- Lesson 2.1: Programming Fundamentals
- Lesson 2.2: Conditional Programming
- Lesson 2.3: Loops
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- Lesson 3.3: Autonomous Systems
- Lesson 4 : Debugging your code

Lesson 1.2 Image Recognition Training

Introduction (10 min)

Main Activity (20 min)

Wrap up (10 min)

Extras

Lesson Overview:

In this chapter, children will learn about training an image recognition model.

Lesson objectives:

1. Students will understand what is image recognition?
2. They will learn how an image recognition model is trained.
3. Students will also learn about practical applications of image recognition.

Requirements:

1. CoderMindz game board.
2. Images of 3 famous, but hard to re-collect personalities, for example - Graham Bell, Thomas Alva Edison and Nikola Tesla.

Getting started:

1. We'll introduce the CoderMindz Tokens and Coder Mindz Coder Cards in this chapter.
2. Announce the class that they will be learning how an image recognition model is trained.
3. Before you begin, refresh the previous chapter and solve doubts if any.

Image recognition training:

Like we studied earlier, artificial intelligence is to give human like intelligence to computers. So, in image recognition training we provide the computers with large sets of image data of our objects of interest (human face, cats or dogs in our case) and pass it on to a neural network, which learns to recognize similar faces and most of the time they predict accurately more than 90% depending upon the training.

So how does a Neural Network recognize an image you ask?

Well, Neural Networks process the image data through a Convolutional Neural Network, which uses is inspired from the way we see things through our eyes. What we see through our eyes are the light signals that we pass to our brain, which then processes the information and depending on the event creates a memory out of it. In the same way, computers see an image as a set of pixels. Pixels when grouped together in patterns form a line, contour or corner. Computers recognize these contours, lines and corners along with intensity (how dark or low an image is) and stores it as the features of that image.

This is how computers learn about images by gathering features and and by organizing the data using classification and feature extraction.

Applications of Image recognition:

Image recognition is used in a wide range of computer vision applications like traffic detection, facial recognition, used in scientific

communities and research of life threatening diseases like cancer, HIV, etc. It's applications are ever increasing.

Board Activity:

1. Introduce the 16 tokens in the game divided across four categories - Animals, Numbers, Edibles and Vehicles.
2. Ask the students to choose one of the four bots and ask them to take the respective color of card deck.

Extended Learning:

Remind students how computers train neural networks from the previous chapter. Now display one of the three pictures of famous personalities. Let's say you have an image of Graham Bell. Ask the class if they know the person in the picture. It'll be hard for them to recognize, but let them try. After they've tried, announce to the class the name of this famous personality.

Now, display other two images by following the same procedure. Ask them to remember the names as you'll be asking them in the later chapters.