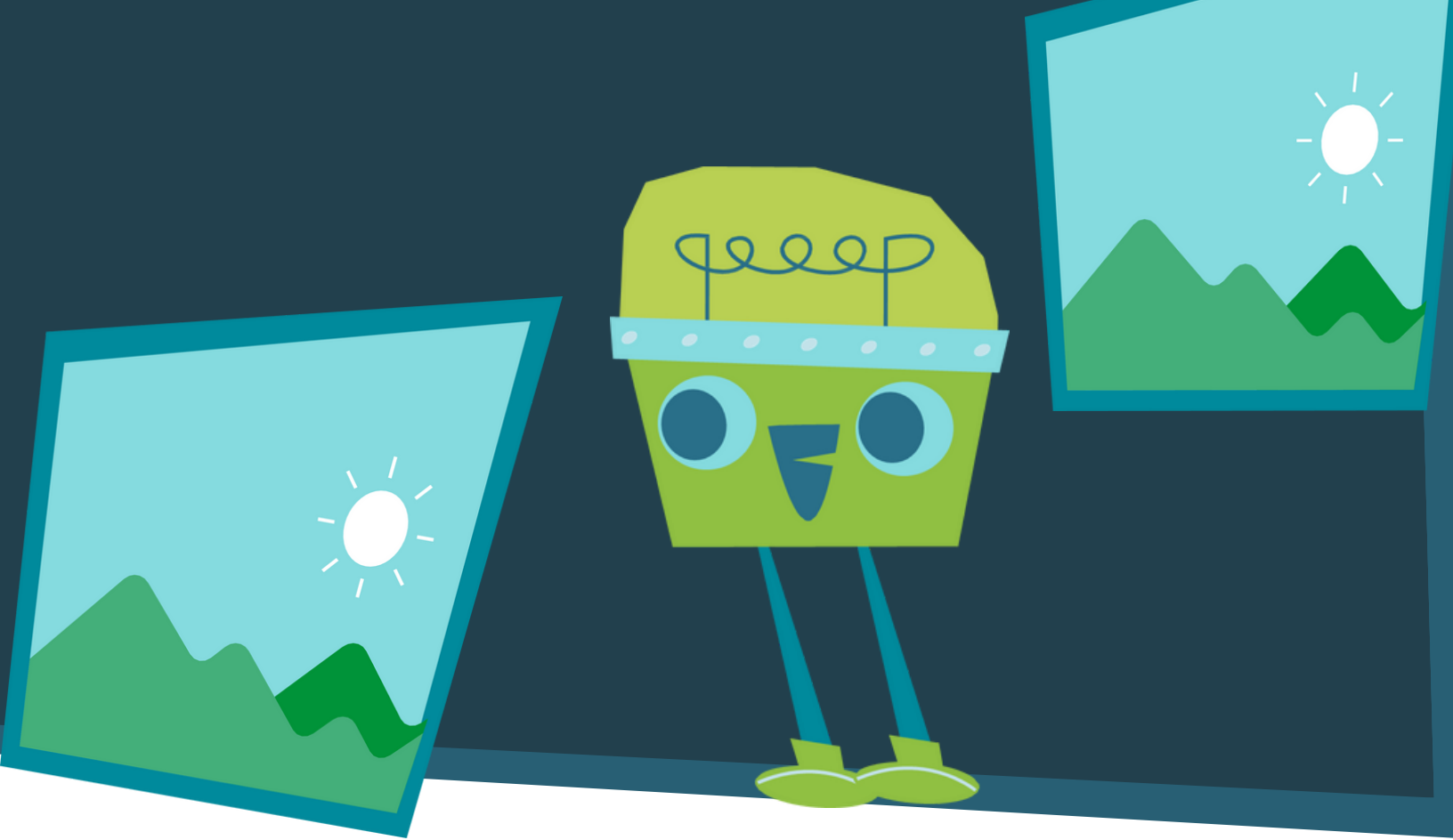




Success Through AI Mastery
STUDENT GUIDE

LESSON 3

Computer Vision



**JA
Canada**

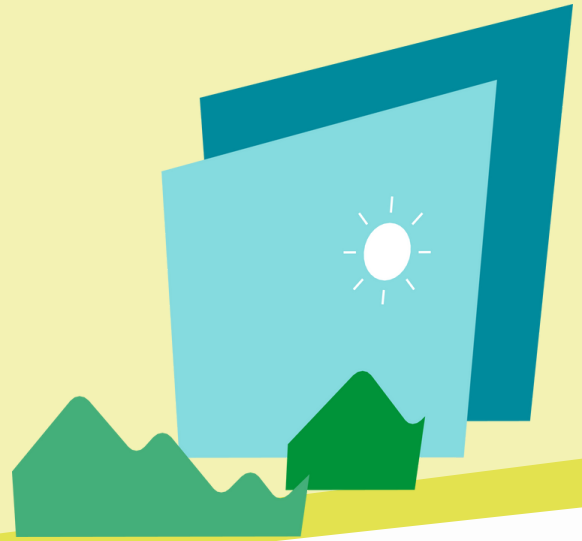
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Lesson 3:

Computer Vision

OVERVIEW

In this lesson, you will discover how machines "see." You will learn how computers interpret images as pixels and explore key tasks of Computer Vision, such as Object Classification (identifying what an object is) and Object Detection (finding where an object is).



KNOWLEDGE CHECK

Instructions: Place a check mark (✓) next to the correct answer or write your answer in the space provided.

1. A grocery store is developing a new self-checkout system that uses a camera to identify items. When you place an apple on the scanner, the system needs to answer the question, "Is this an apple, a banana, or an orange?" Which Computer Vision task is this?

- ☐ a) Object Detection
- ☐ b) Object Classification
- ☐ c) Object Segmentation
- ☐ d) Object Tracking

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2. Number the steps of the Computer Vision process in the correct chronological order (1-4).

- ___ Processing (Enhancing the image data)
- ___ Decision (Taking an action based on the analysis)
- ___ Acquisition (Capturing the image)
- ___ Analysis (Recognizing patterns and objects)

3. A wildlife conservation group is using drones to monitor caribou populations in Northern Canada. The AI needs to fly over a wide area, find all the caribou in the video feed, and draw a box around each one to count them. Which Computer Vision task is most important for this goal?

- ☐ a) Object Classification, to determine if the animals are caribou or wolves.
- ☐ b) Object Landmark Detection, to identify specific points on each caribou's face.
- ☐ c) Object Segmentation, to outline the exact shape of each caribou.
- ☐ d) Object Detection, to locate and count all the individual caribou in the scene.

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ACTIVITY: DESIGN A VISUAL FEATURE

Design your AI Companion: Step 3

How would your AI companion use its "vision" to help you?

1. Describe the Task:

What visual problem would it solve? (e.g., "It would scan my messy handwritten notes and turn them into digital text," or "It would identify different plants in my garden.")

2. Identify the Computer Vision Tool:

Which tool would it use? (e.g., Object Detection, Classification, Optical Character Recognition (OCR), etc.)

3. Explain the Benefit:

How would this feature make your life easier?

Lesson 3: Computer Vision

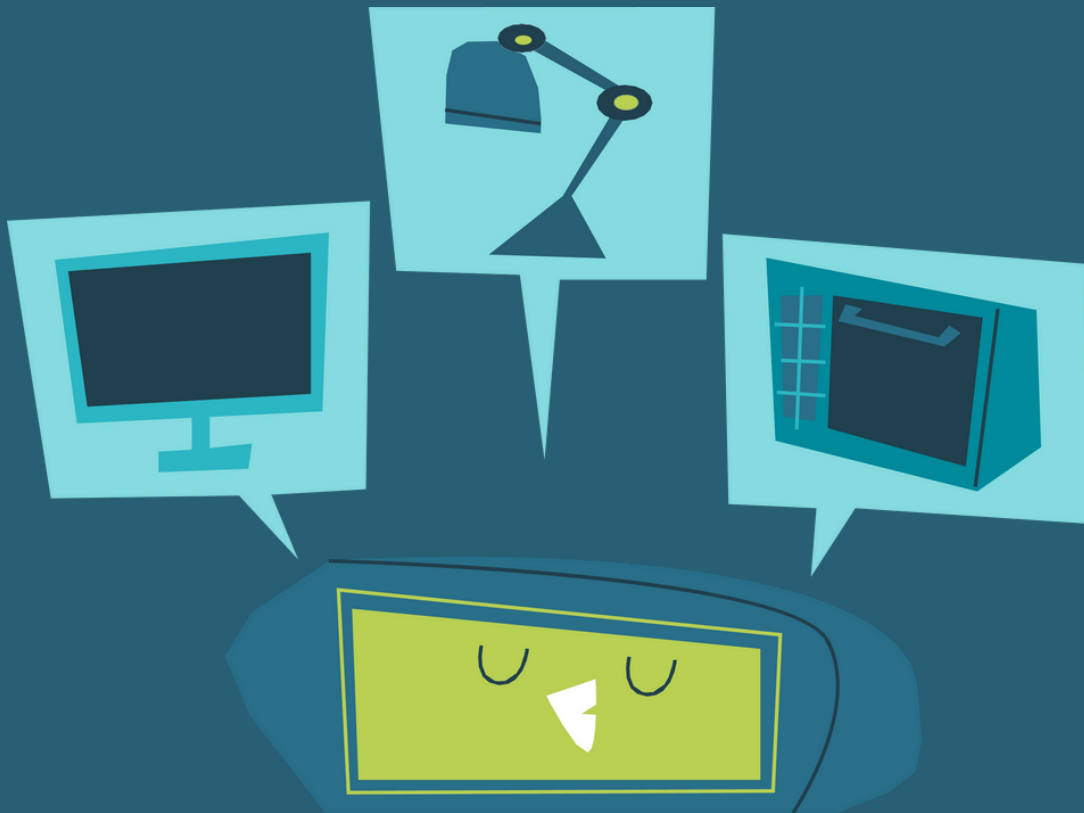


LESSON 3 ANSWER KEY

1. b

2. 1: Acquisition, 2: Processing, 3: Analysis, 4: Decision

3. d



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GLOSSARY

Computer Vision (CV): A field of AI that enables computers to "see" and interpret meaningful information from digital images, videos, and other visual inputs.

Artificial Intelligence (AI): The field of computer science focused on creating systems that can perform tasks that typically require human intelligence, such as learning, reasoning, and problem-solving.

Deep Learning (DL): A specialized subfield of Machine Learning that uses complex, multi-layered neural networks to learn from vast amounts of data and is especially powerful for tasks like image and speech recognition.

Object Classification: A Computer Vision task that answers the question, "What is this object?" (e.g., identifying an image as containing a "cat" or a "dog").

Object Detection: A Computer Vision task that answers the question, "Where is the object?" by identifying the location of one or more objects within an image, usually by drawing a box around them.

Sensors: The components of a robot that act as its "senses," gathering information about its environment (e.g., cameras, microphones, proximity sensors).