RGPV PYQ

> *Computer vision is a field of artificial intelligence that deals with the ability of computers to interpret and understand visual information from the world around them.*

It involves techniques for extracting, analyzing, and processing digital images and videos to extract meaningful information.

Computer vision has a wide range of applications, including:

1. Object detection and recognition: Identifying and classifying objects in images and videos. This is used in applications such as facial recognition, self-driving cars, and medical imaging.

2. Image segmentation: Partitioning an image into meaningful regions or objects. This is used in applications such as medical image analysis, satellite image analysis, and autonomous robots.

3. Image tracking: Tracking the movement of objects or features in a video sequence. This is used in applications such as motion tracking, traffic monitoring, and video surveillance.

4. Video understanding: Analyzing and interpreting the content of videos, including the actions of people and the interactions between objects. This is used in applications such as video surveillance, sports analysis, and human-computer interaction.

Example:

Object Detection in Self-Driving Cars

Self-driving cars are one of the most exciting applications of computer vision. These cars use cameras, radar, and other sensors to perceive their surroundings and make decisions about how to navigate. One of the key tasks in self-driving cars is object detection, which involves identifying and classifying objects such as other cars, pedestrians, and road signs.

Object detection for self-driving cars typically involves several steps:

1. Image preprocessing: The raw image data is preprocessed to remove noise and prepare it for further analysis.

2. Feature extraction: Features are extracted from the image that represent the characteristics of the objects. These features could be the intensity of pixels, the edges of objects, or the texture of objects.

3. Object classification: A classifier is used to classify the extracted features into different object categories. This classifier could be a support vector machine (SVM), a neural network, or another machine learning algorithm.

4. Localization: The location of each object is determined in the image. This could be done using bounding boxes, masks, or other techniques.

References:

- "Computer Vision: Algorithms and Applications" by Richard Szeliski (2010)

- "Computer Vision: Principles, Algorithms, Applications, Learning" by E.R. Davies (2018)

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