Assignment #05

Hope To Skills

Free Artificial Intelligence Course

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Solve the following Task

Explain the following terms in your own words with Example Images of each.

i. **Text Summarization**
ii. **Object Detection**
iii. **Image Segmentation**
iv. **Image Classification**

i. Text Summarization:

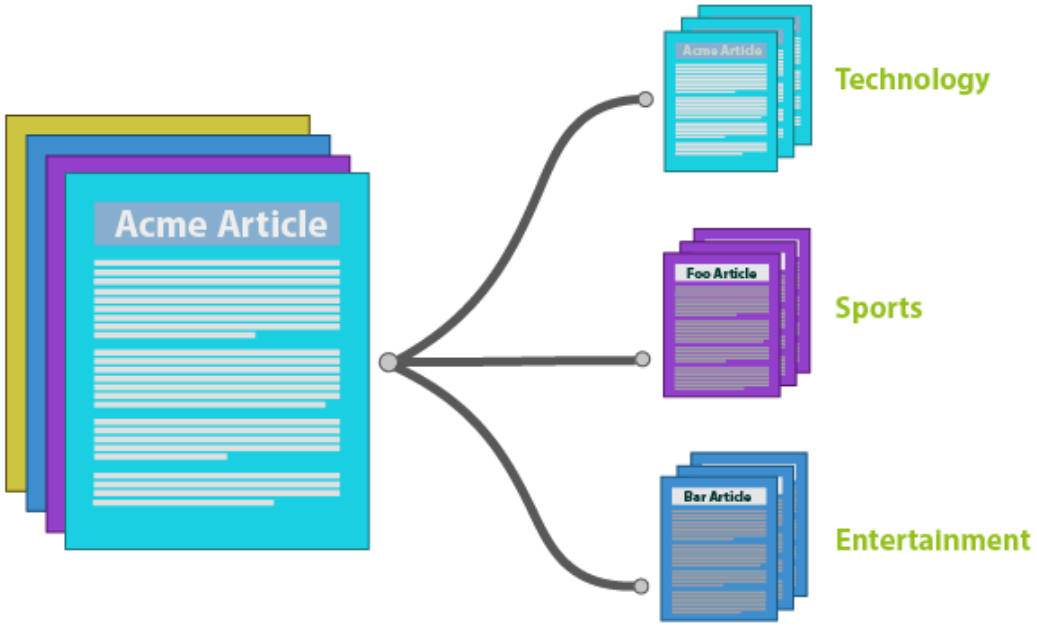
Text summarization is a natural processing language (NLP) task that involves the process of summarizing a longer piece of text into a shorter version, while capturing its main ideas and key information. The goal of text summarization is to provide a concise summary that captures the key points of the original text, allowing readers to quickly understand the context of the entire document.

Types:

- **Extractive summarization** refers to extracting the sentences directly from the original text and combining them to create a summary.

- **Abstractive summarization** refers to the understanding of the meaning of the original text and generating new summary that convey the same information in more condensed form.

Example Image:



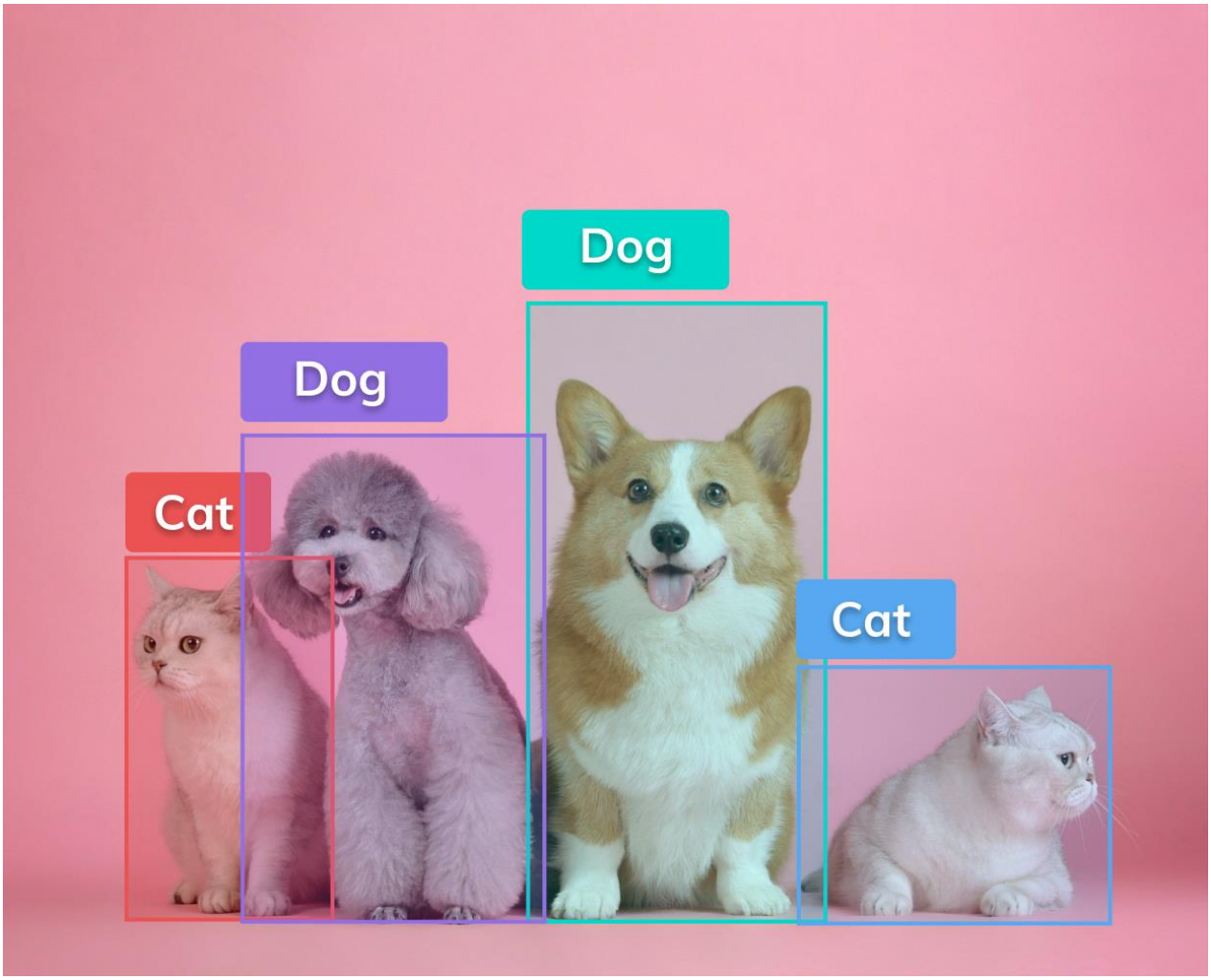
ii. Object Detection:

Object detection is a computer vision task that involves identifying objects within an image or video. The goal of object detection is to detect and classify multiple objects within a given scene.

In object detection, the algorithm analyzes an input image or video frame and identifies the presence of different objects, such as cars, pedestrians, or animals. It not only identifies the objects but also provides their spatial location by drawing bounding boxes around them.

Its algorithms use machine learning and deep learning techniques to perform their task. These algorithms are trained on large datasets, where images or video frames are labeled with the presence and location of various objects.

Example image:



iii. Image Segmentation:

Image segmentation is a computer vision technique that involves dividing an image into multiple distinct segments. The process of image segmentation helps in understanding the structure of an image by partitioning it into semantically different regions. This allows computers to analyze images more effectively, as the segmented regions can be individually processed and analyzed.

There are various methods used for image segmentation such as:

- Thresholding
- Edge-based segmentation
- Region-based segmentation

- Clustering-based segmentation

The goal of image segmentation is to assign class to each pixel in the image, grouping together pixels that belong to the same region.

Example Image:

iv. Image Classification:

Image classification is a fundamental task in computer vision that involves assigning labels to images based on their visual content.

In image classification, a machine learning model is trained using a labeled dataset, where each image is associated with a specific class label. The model learns the patterns, features, and characteristics within the training data to differentiate between different classes. Once trained, the model can then predict the class label of test images.

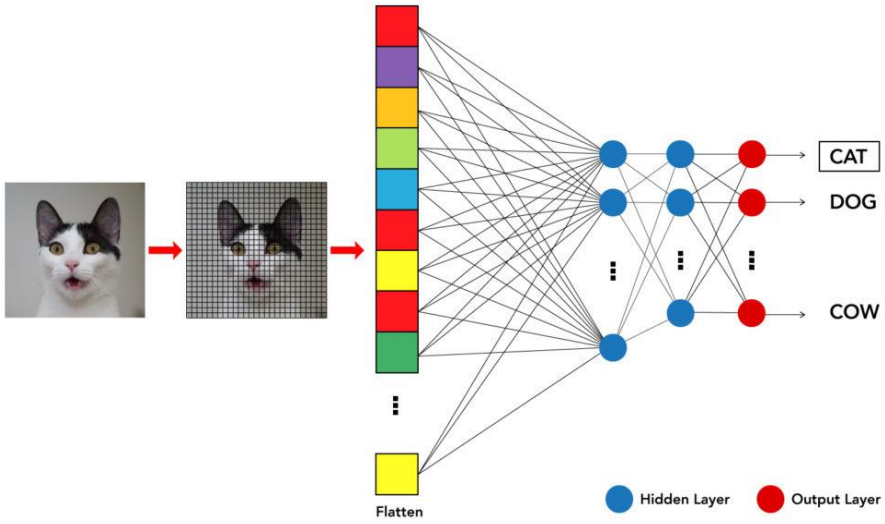
The process of image classification involves the following steps:

- Data collection and preprocessing
- Feature extraction
- Model training
- Model evaluation

- Prediction

The goal of image classification is to develop models or algorithms that can automatically recognize and classify images into pre-defined categories or classes.

Example image:



Thank you!!!