M.O.U.S.E
Computer Vision Info

C.O.V.E.R.T

Coalition for Observing and Verifying Extraterrestrial Real Threats

Computer Vision

Computer vision is a field of computer science that focuses on enabling computers to identify and understand objects and people in images and videos. Like other types of AI, computer vision seeks to perform and automate tasks that replicate human capabilities. In this case, computer vision seeks to replicate both the way humans see, and the way humans make sense of what they see.

Computer vision focuses on enabling computers to interpret and understand visual information from the world. It aims to mimic human vision by processing and analyzing images or videos to extract meaningful insights and make decisions based on that information. Here's a high-level overview of how computer vision works:

Image Acquisition: The process begins with capturing or obtaining images or video frames from various sources such as cameras, scanners, or other image sensors. The quality and resolution of the images can significantly impact the success of subsequent computer vision tasks.

Preprocessing: Before analyzing the images, various preprocessing steps are applied to enhance the data's quality and reduce noise. These steps may include resizing, normalization, denoising, and color space conversions.

Feature Extraction: In this step, the computer vision system identifies and extracts relevant features from the preprocessed image data. Features are distinctive patterns or characteristics that help distinguish objects or regions of interest in the image.

Feature Representation: Once the features are extracted, they need to be represented in a suitable format for further analysis. This may involve converting raw pixel values into feature vectors or more abstract representations that capture relevant information about the image.

Understanding and Recognition: At this stage, the computer vision system uses machine learning algorithms or deep learning models to interpret the extracted features and recognize objects, patterns, or structures within the image. Convolutional Neural Networks (CNNs) have revolutionized this aspect of computer vision, enabling high accuracy in tasks like object detection, image classification, and segmentation.

Post-processing and Analysis: After recognition, the system may perform additional post-processing to refine the results or to extract more detailed information. For example, in object detection tasks, non-maximum suppression can be used to eliminate duplicate detections and output the most relevant bounding boxes.

Decision Making: Once the computer vision system has processed the visual data and made inferences or identifications, it can use that information to make decisions or take actions.

Training and Adaptation: Many computer vision systems employ machine learning algorithms, which require training on large datasets. During training, the model learns to recognize patterns and features that enable it to perform specific tasks. As more data becomes available or requirements change, the model may need to be retrained or adapted to maintain optimal performance.