

Computer Vision

Computer vision is the field of computer science that focuses on replicating parts of the complexity of the human vision system and enabling computers to identify and process objects in images and videos in the same way that humans do.

What is Computer Vision?

Computer vision is a field of artificial intelligence and machine learning that studies the technologies and tools that allow for training computers to perceive and interpret visual information from the real world.

‘Seeing’ the world is the easy part: for that, you just need a camera. However, simply connecting a camera to a computer is not enough. The challenging part is to classify and interpret the objects in images and videos, the relationship between them, and the context of what is going on. What we want computers to do is to be able to explain what is in an image, video footage, or real-time video stream.

Benefits of Computer Vision

Improve Accuracy

Computer vision reacts to images based only on the data that is presented—and, importantly, all of the data. Although it is able to make assumptions based on patterns, it does not have the disadvantage of a human brain’s tendency to leap to conclusions that may not be accurate. Computer vision also operates at the pixel level, which is a level of detail that the human brain does not process. This allows computers to provide more accurate results, which can be advantageous when it comes to applications such as using image-based detection for early cancer detection.

Deliver Faster Results

The brain works fast and efficiently, but computers are better at multitasking, which can allow them to deliver faster results for some applications.

Computers can also be dedicated to performing specific tasks for long periods of time. For example, tagging and categorizing a batch of 10,000 images for an e-commerce site might take a human six or more hours, not including time for breaks and the inevitable interruptions that happen in life. One example of this type of computer vision application is an online book retailer that uses image verification to automatically select the best thumbnails for product pages

Reduce Costs

Once a computer has been trained, it can repeat the same tasks with minimal cost—and even continues to learn while it does this. This can save countless hours of manual labor and the associated costs. One example is incorporating computer vision into surveillance systems to identify shrinkage in retail stores. Data from surveillance cameras can be used to identify gaps on store shelves, prompting retailers to keep popular items stocked and helping them identify purchasing trends.

Ethics of Computer Vision

Provide Unbiased Results

When a computer looks at an image with a specific goal, the irrelevant information is not taken into account. This helps reduce the types of bias that humans might introduce to a process, whether intentionally or unintentionally.

For example, when an insurance adjuster looks at images of a damaged vehicle, they might become biased by the surrounding context, such as symbols of wealth, human expressions, and so on. However, when a computer analyzes the image, it looks only at the vehicle and the damage it sustained, providing an objective analysis of the insurance claim.

Offer a Unique Customer Experience

Computer vision has been used to enhance the customer experience both online and in retail stores. Online, it can be used to identify products or brands that an individual is most likely to buy based on images in social media profiles. In grocery stores, Amazon Go has used computer vision to revolutionize the shopping experience by detecting items in carts as people move throughout the space and automatically charge them, eliminating checkout lines. Facial recognition in retail stores also allows marketers to provide a customized experience from the moment customers walk in.

Accurate outcome

It's no secret that machines never make any mistakes. Likewise, computer vision systems with image-processing capabilities will commit zero mistakes, unlike humans. Ultimately, products or services provided will not only be quick but also of high quality.