AI Image Processing and use for Commercial Applications

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Computer Vision, AI Powered photos quality optimisation and editing workflow automation for online sales, sharing, special applications
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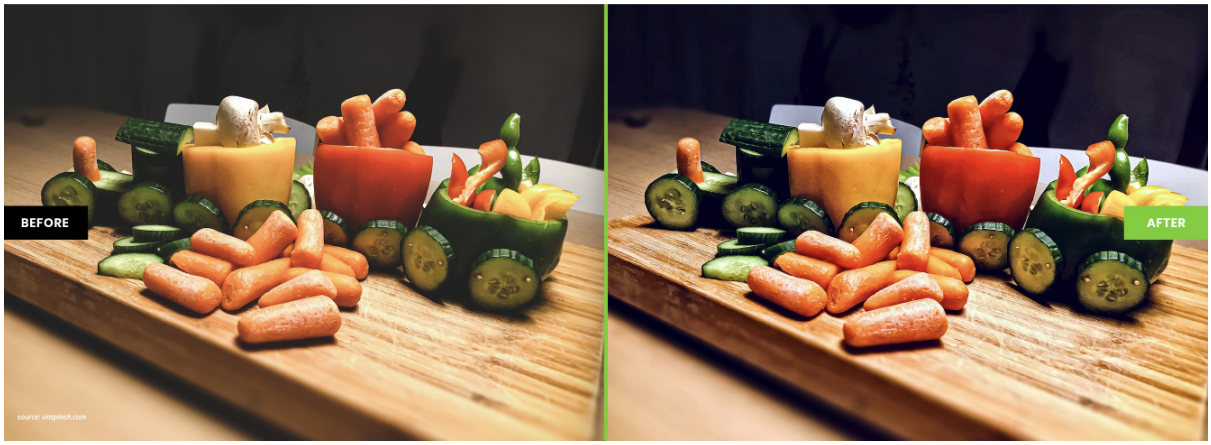
In the day and age of digitization, transformational technologies have contributed immensely among several industries. The most capable innovations are witnessed in the artificial intelligence sphere. With a growing number of research, products, and services in artificial intelligence (AI), it is evident that AI has tremendous potential. Among the most popular and widely used AI technologies are associated with image processing and its analysis. As AI's domain continues to evolve, its sub-branches such as machine learning, deep learning, and computer vision have taken center stage among global innovations.

Today, computer vision is predominant among object detection, image segmentation, and classifications at a rapid pace that outperforms the existing technologies for image analysis. Some of the critical areas of computer vision accomplishments are in the automotive industry, quality control, agriculture, media, health, customer-centric industries, e-commerce, and manufacturing, to name a few. With endless possibilities of processing extensive image data effortlessly, computer vision is considered an effective solution for deriving business value with image-based data to understand its customer segment. The article deep dives into the essential terminologies and the possible solutions for image-based business services using computer vision technology.



Overview of Computer Vision and Image Processing

The terms “computer vision” and “image processing” are synonymously used in several contexts. Although both technologies include processing of images, it differs in its approaches. Image processing is associated processing of the images with the means of algorithms. Some image transformations relate to smoothing, sharpening, contrast enhancement, noise removal, and adjusting brightness and edge detection. However, under image processing, the input and output are image-based.

On the other hand, computer vision is related to how machines interpret images. The input is image-based for computer vision systems that form its core during the system’s training processes such that the system can produce knowledge-based results such as object detection, classification of an object in the image, object tracking tasks, semantic segmentation, and instance segmentation to derive meaningful information.

The common factor in computer vision and image processing is the involvement of image processing algorithms. For example, a computer vision system uses well-processed images instead of directly acquired images from a device. The earlier uses of image processing methods could not do advanced image-related tasks such as beautification filters, face detection, and several more. These tasks have been a possibility with computer vision. Also, the integration of machine learning and deep learning techniques that powers the computer vision systems can produce a state of the art results. It is possible to determine and classify two different objects in an image, i.e., the systems can classify dogs and cats from an image.

In recent times, advanced uses are used by e-commerce industries to enhance user experience while navigating the website, understanding the user’s pattern from the images explored. Furthermore, other industries use computer vision for lane detection, robotics, manufacturing supervision, and quality control check.

As computer vision continues to transform, newer innovations have been introduced capable of providing task-specific performance with higher accuracy for complex problems.

Problem-Solving: Traditional Image Processing

Vs. Computer Vision

The generation of image-based data has reached an astounding number. The advent of computer vision has recently gained a strong foothold in the industry. However, with computer science existing as a field for decades, image processing was co-existing as a part of it. The primary tasks involved improving the image quality with algorithms and producing reliable images for further tasks. However, further advancements throughout the years have led to more complex problems that needed to be addressed. Image processing was only a small part of the solution. As the data generation and the problems continued to evolve rapidly, it formed the founding base of computer vision technology.

While numerical data derives provides business insights, the services associated with image-based data can achieve business value with its appropriate usage. Additionally, image-related data can provide automated supervision capabilities to a smart system. Furthermore, the e-commerce and social media industries are heavily relying on image-based data. While image processing can refine the images for better quality, computer vision approaches extend beyond a simplistic image transformation procedure. The fundamental problem areas for traditional approaches are:

- Manual extraction of features.
- Inability to perform accurately with high volume and complex data.
- Achieving higher performance accuracy.
- Faster processing
- Automation
- Time-consuming
- Increased training time

With organizations looking to address complicated problems using image processing, the need for a more robust offering is essential. Therefore, computer vision has been successful in addressing task-specific problems such as:

- Detecting the location of the object.
- Detecting accurate edges of the image object.
- Classifying the images,
- Mapping of boundaries with the objects in the images,
- Supervision possibilities for robot logic building and a comprehensive understanding of a surrounding with proper training such as robotic arm movement or lane detection.

Today, it is possible to notify users of similar services based on recent purchases due to image-related data analysis and monitoring, understanding the buying pattern, suggesting content on social media based on user preference, identifying an organ, and reconstructing an image, among several more possibilities. The traditional technologies were rigid in their process while requiring object-specific and manual involvement to process the entire workflow. Computer vision technologies have covered traditional approaches' significant limitations by incorporating traditional image processing with advanced technologies to create a dynamic solution.

Computer Vision: Success Story

In the world of startups, the growing competition in the market is becoming broader. With newer technologies being introduced rapidly, it is challenging to provide problem-based solutions, especially in artificial intelligence.

One such company is **Deeplai.** The OptiwAI is a computer vision-based cloud solution capable of real-time processing of images with a pre-defined workflow, as well as customizable workflow settings — The essential features of the computer vision solution comprise:

- ### Optimization

The final optimization results produce a visual enhancement of the image without modifying the actual context of the image. The product is well equipped to address distinctive customer preferences and adjust to any guidelines or brand requirements.

- ## Artifact Removal

Artifacts can degrade the image quality while causing loss of details. Thus OptiwAI enables recovery of loss of details of the images and from image compression tasks. Besides, it is capable of tackling problems related to low-quality image conversion to high-quality outputs.

- ## Upscaling

There are enhanced upscaling techniques capable of upscaling up to 8K resolution, thereby producing crisp and sharp image quality.

- ## Anonymization

Perhaps an essential feature of the OptiwAI is anonymization. It is capable of auto-blurring of sensitive information and private information in the images.

- ## Auto-Cropping Features

OptiwAI can provide auto-cropping features by automatically detecting the critical object in the image and cropping it to the desired size. Additionally, the unwanted regions in the images can be removed entirely.

- ## Rotational and Size Alterations

The images from the different sources often occur in different positions and sizes that are not appropriate for use. Therefore, OptiwAI offers to alter many images' sizes to a standard size and rotate to accurate positions. It is a handy feature when dealing with an extensive image dataset.

- ## Object Recognition

The most common feature in a computer vision-based product is object recognition. However, the company has moved a notch higher. With a building block consisting of classification, photo tagging, detection, and segmentation with the bounding box approach's likes, the objects of interest are identified with assigned labels.

- ## File Format Conversion

Another key feature is the automated conversion of file formats into the desired format. It is highly effective for real-time work and essential for research purposes.

- **Workflow Integration (SaaS Version)**

Not all companies handle and process their data in the same way which is why workflow automation is an important feature for computer vision processing. Deeplai offers seamless workflow integrations on the SaaS version of their application.

Conclusion

Deep learning technologies have become smarter and more computationally powerful. As deep learning is a critical component of computer vision, it is evident that computer vision's success has surpassed the expectations envisioned by experts. The effectiveness of computer vision is possible with its responsible usage.

While there are numerous challenges, the potential of computer vision is endless. Companies must address the challenges with each improvement throughout the years. Thus, it is highly crucial for adopting the emerging technical change and adopting technologies such as computer vision for achieving efficiency in a digital era.