IMAGE ENHANCEMENT METHODS AND ANIMATION USING OpenCV

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Abstract - The world is defined by images, each of which tells its own story and contains a wealth of useful information. This data can be acquired with the assistance of the strategy known as Picture Handling. Picture Handling remembers changing the idea of a picture for request to work on its pictorial data for human understanding, for independent machine discernment. Before, a skilled individual was required to draw or transform an image into an animated sketch or image. After the development of technology, it became necessary to use highly graphical software to accurately trace an image feature, shape the edges, and add additional features that were specific all of which required a significant amount of knowledge or skill even when utilizing technology. Everyday image processing techniques that helped people or made the process of converting images easier have emerged as technology advances. Python and libraries like open cv can be used to carry out image processing. We can create applications for real-time computer vision with the help of OpenCV, a library that runs on all platforms. It primarily focuses on image processing, video capture, and analysis, including face and object detection capabilities.

Index Terms - OpenCV, Picture Handling, Image Processing, Computer version.

1.INTRODUCTION

Nowadays, web-based media are used extensively. Additionally, participating in this online community has always been a priority for each customer on these online media platforms. Images, blog posts, artwork, tweets, and other non-textual content are all used to attract the attention of supporters or partners in order to have an impact on them or interact with them on such friendly platforms. We intend to provide a clever solution to their requirements by giving their image an animation-like effect. The client can later save these images for themselves, share them with family, and do whatever they want with them on any friendly media platforms. With a variety of online applications, you can use your own profile picture, create an interesting symbol, or turn your photo into an animation. In the medical field, image processing is used extensively, such as in MRI/ET scans. The amount of research done on image processing has made it easier to find tumors earlier. Both the field of biology and the field of image processing rely heavily on it. Because it is possible to identify early detection and begin effective treatment, this research is bound to save livelihoods.
In this project we are going to perform the following enhancement methods:

1. **Cartoonifying**
2. **Sketching**
3. **Black and white**
4. **Smoothening**
5. **Merging**

2. LITERATURE SURVEY

2.1. Existing Model

The current system for image enhancement techniques in Python that make use of open cv libraries is, to some extent, effective. Grayscale makes it easier to see and draw a picture, but the technology used in the current system has many flaws and issues.
The current system has the following shortcomings:
• The cartoon has less in common with the original.
• Edges are not detected with accuracy.
• Fewer Features (such as filters, filter sizes, and libraries for an exact view)

2.2. Proposed Model

To get the technology that can accurately detect edges, apply a greater number of bilateral filters, and apply a greater number of colors to the cartoon we obtain, we include the libraries of easygui and the new CV library cv2 in addition to the Technology's existing system. Additionally, this proposed technology enables us to resize the given image, allowing us to use them for a variety of purposes. We will essentially employ a number of image conversions and filters.

2.3. Related Work

OpenCV is a computer vision, image processing, and other software library that is free to use. It is an essential component of modern computer systems and plays a significant role in the operation of real-time images. By utilizing this product the client can handle picture, distinguish items and this library of OpenCV is step by step developing a direct result of its capacity to perform more complicated errands in handling pictures and so on in a reliable way. This library has been applied broadly in organizations, public bodies (like Government bodies), deeply grounded programming organizations like Google, Hurray, Microsoft, Intel, IBM, Sony, Honda utilize OpenCV. OpenCV has a high rating will be used by self-driving cars to collect colors from other cars' lights, road traffic lights, passing lights, stop lights, and indicator lights using Deep Learning.

2.4. Methodology

CARTOONIFYING:

Detecting, blurring, and bolding the edges of the actual RGB color image is the first step in the process of creating a cartoon effect image. To make the RGB image smooth, quantize it, and change it to grayscale. The outcomes of combining the images contribute to achieving the desired result.

To produce a high-quality image, an essential property is to locate a smooth outline that encloses or represents the image's shape. All tasks involving edge processing are: Median Filter, Edge Detection, Morphological operation, Edge Filtering, Bilateral Filtering, Quantize Colors and Recombine.

SKETCHING:

There are two main stages to the system. It begins by creating a stroke layer to imitate painters sketching the contours of an image it receives as input. After that, it creates tonal textures, mimicking the hatching technique used by artists to draw brightness and shade with pencils. In the end, the two layers are combined to produce a pencil drawing that is not photorealistic.

One of the most fundamental pictorial languages for abstracting human perception of natural scenes is pencil drawing, which can be better understood through this system. In addition, artists have discovered that by rendering images less photorealistic, they enable audiences to feel more immersed in a story. As a result, rendering real scenes in a non-realistic, artistic manner is frequently desired in the game and film industries.

SMOOTHENING:

We can use image smoothing technology to reduce undesirable effects, reduce noise, and improve image quality to make the image clearer. Additionally, image processing is the use of computer technology to improve the image quality of a technology. The technology for image processing is undergoing extensive and widespread development at the moment, and the requirements for image processing are gradually increasing in a variety of fields. However, technology is also important in the following two areas: On the one hand, it makes image processing technology more and more integrated with contemporary technology, and on the other, it makes image processing technology more and more integrated with our day-to-day lives.

BLACK AND WHITE:

Using Python and the OpenCV library, you can convert a color image to black-and-white in a number of different ways. Among the possibilities are: Thresholding, Conversion to grayscale, Thresholding that adapts Otsu's strategy. Finding the most effective method for a particular image can be aided by experimenting with various approaches and adjusting the parameters.
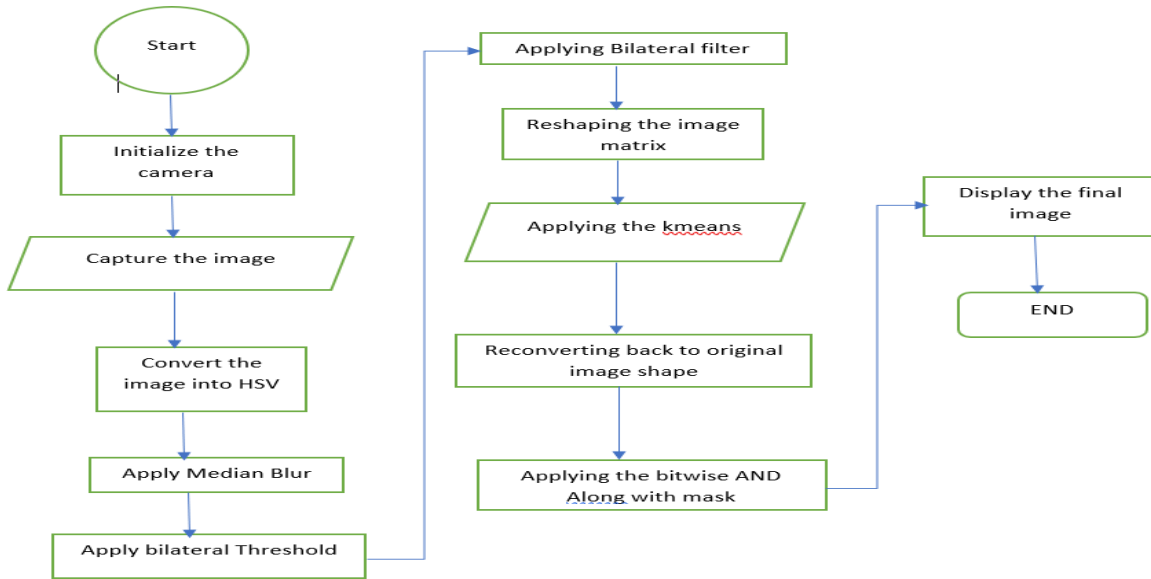
MERGING OF IMAGES:

Image blending is one related task that can be done with the Python OpenCV library. The process of combining two or more images in such a way that the transitions between them are seamless is known as image blending. This can be useful for merging multiple views of the same scene or creating composite images.

Using the cv2.imread() function, load the two images into memory. The cv2.convertScaleAbs() function can be used to convert the images to the floating point format. Blend the images by specifying the weight values for each one using the cv2.addWeighted() function. Using the cv2.imwrite() function, save the blended image to a file.

Image resizing, rotation, cropping, and filtering are just a few of the related operations that can be carried out with the Python OpenCV library. Preparing images for further processing or creating custom image effects can benefit from these tasks. The OpenCV cv2.addWeighted() function can be used to perform image blending. This function returns a new image that is a blend of the two images it received and a weight value for each of them.

3. SYSTEM DESIGN:

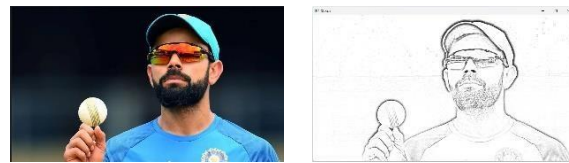### 3.1. System Architecture

3.2. Data Flow Diagram
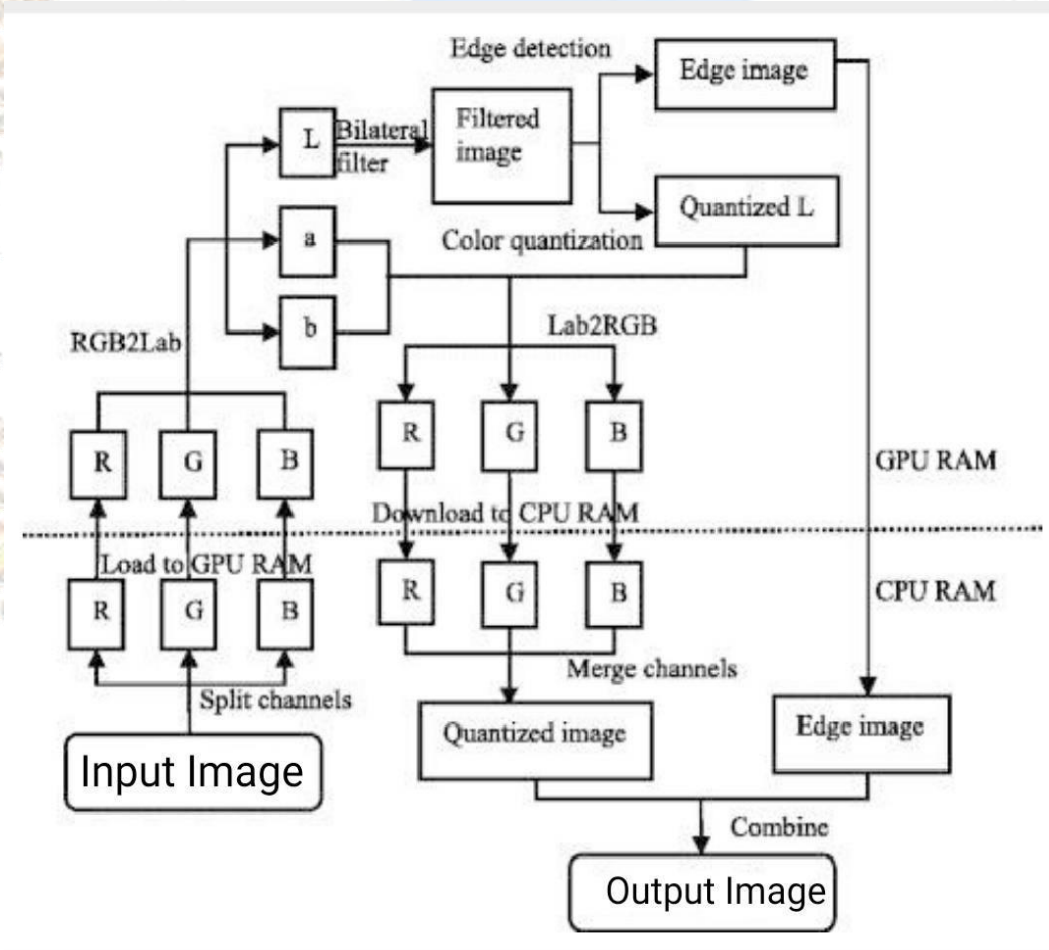
4. RESULTS, DISCUSSION, AND CONCLUSION
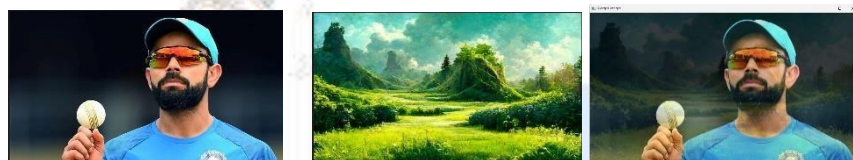
Cartoonifying:

Sketching:

Black and white:

Smoothening:

Merging of Images:

The " **Image Enhancement Methods and Animation Using OpenCv**" project has been successfully implemented and tested. First and foremost, the thesis's title problems are dealt with using the fundamental tools. It includes the history and origin of image processing, various types of uncertain environments, and current cartoon imaging techniques. The topic of image processing has gained significant notoriety among researchers over the past three decades due to its numerous and widespread applications in a variety of scientific and engineering fields. Digital video processing, remote sensing, and finance are just a few examples of areas where image processing can be useful. Conclusion and Future Directions First, we photograph the wire's internal structure with a high-resolution camera. Second, for image pre-processing, we make use of OpenCV's image processing functions. Thirdly, because image edges blur, we segment images using morphological opening and closing operations. The paper's main selling point is its ability to solve various types of images with one, two, and three objects that cannot be solved by existing approaches but can be solved by our proposed approach.

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