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Comparing and Analyzing OpenCV with Matlab in Image Segmentation

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Abstract- Image Segmentation is a field of study that helps to develop techniques to identify images and displays. It has various features like image recognition and object detection etc. Image detection is used for vehicle detection, web images, and safety systems. Its algorithms are Region-based Convolutional Neural Networks (RCNN), Faster-RCNN and Matlab that have shown state-of-the-art performance. But by introducing OpenCV in Machine Learning it has help to make work Easier. There are many scientific computing environments used to code such algorithms. Matlab is one of the most tremendously successful and widespread scientific computing environments that is rich of toolboxes, libraries, and data visualization tools. OpenCV is a (C++)-based library written primarily for Computer Vision and its related areas. This paper presents a comparative study using 20 different real datasets to compare the speed of Matlab and OpenCV for some Machine Learning algorithms. Although Matlab is more convenient in developing and data presentation, OpenCV is much faster in execution.

Keywords:- Matlab, OpenCV, Faster-RCNN, Convolutional neural network, COCO.

I. INTRODUCTION

Image segmentation is a most important part in the image processing, it is used almost everywhere to process the images so our model should be able to recognize what's inside the image. The segmentation splits the image into many sections or objects. The level to which the splitting the image is being carried rely on the problem is which has been solved.

Images are all over the world, and the demand for high-speed and convenient real time processing for these images and videos is increased, especially after the development in digital communications and digital images devices. Image segmentation means assigning a label to each pixel in the image such that pixels with same labels share common visual characteristics. It makes an image easier to analyze in the image processing tasks.

There are many different techniques available to perform image segmentation. Our motive is to implement the same concept as we humans try to implement, while understanding the image which we visualize. In human vision, the complex image is immediately segmented into the simple objects based on color, texture, patterns, shapes, etc.

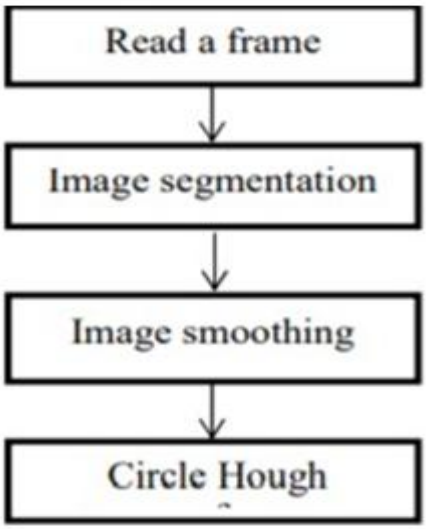

Fig 1. Image segmentation.

This same thing is constructed with the help of the image segmentation techniques in the computer

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vision system. We could segment the digital image based on these features, so that the task of understanding of image could be done in a simple and humanly way.

In this paper, the input frame from the camera is segmented to pick up the target color, after that smooth the resultant image to reduce noise, and at the end circles detect

II. LITERATURE REVIEW

In the late 1960s, Image Segmentation began at universities which were pioneering artificial intelligence, it was meant to mimic the human visual system, as a stepping stone to endowing robots with intelligent behavior.

What distinguished computer vision from the prevalent field of digital image processing at that time was a desire to extract three-dimensional structure from images with the goal of achieving full scene understanding.

Studies in the 1970s formed the early foundations for many of the computer vision algorithms that exist today, including extraction of edges from images, labeling of lines, non-polyhedral and polyhedral modeling, representation of objects as inter connections of smaller structures, optical flow, and motion estimation

The advancement of Deep Learning techniques has brought further life to the field of computer vision. The accuracy of deep learning algorithms on several benchmark computer vision data sets for tasks ranging from classification, segmentation and optical flow has surpassed prior methods

III. SEGMENTATION DONE USING OPEN CV

Fig 2. Defense.

Fig 3. Airport Bay.

Fig 4. Parking Bay.

Fig 5. Movie Theatre.

IV. FUTURE SCOPE

Image segmentation has come a long way from manual segmentation to reasonable automated segmentation through the application of various techniques and methodologies. Using just a few simple grouping cues, one can now produce rather impressive segmentation on a large set of images.

With increasing power and sophistication of modern computing, the concept of computation can go beyond the present limits and in future, image processing technology will advance and the visual system of man can be replicated. The future trend in remote sensing will be towards improved sensors that record the same scene in many spectral channels.

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Graphics data is becoming increasingly important in image processing app1ications. The future image processing applications of satellite-based imaging ranges from planetary exploration to surveillance applications.

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V. COMPARING OPENCV AND MATLAB

Parameter	Matlab	Opencv
Type	Ide	Library In Ide
Cost	Need Expensive	Free
Portability	License	Yes
Usage Suggestion	No	Fast In Process
Accuracy	Lagging In Process	Accurate

VI. CONCLUSION

The results show that the code, which is written in Py Charm and Open CV library, to find a circular object with specific color from a Image Segmentation, taken by a web, speeds up the system The graph shows that which programming languages have high demand over the years.

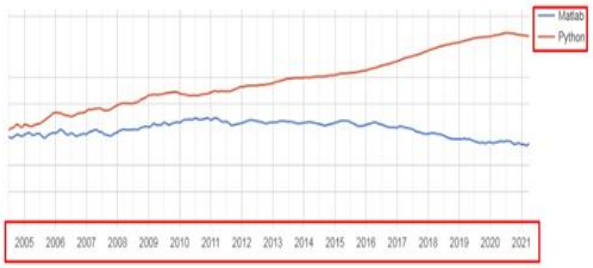

Fig 6. programming languages have high.

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