OBJECT MOTION DETECTION AND COLOR TRACKING

Submitted to:

SAGAR PANDE

Prepared by:

VENKATA ROHITH RAGHUPATRUNI   Rollno: 68

GUNTUKU ROHIT   Rollno: 24

SECTION:K18KK

LOVELY PROFESSIONAL UNIVERSITY

Transforming Education Transforming India

ABSTRACT:

The project includes the object detection and color tracking. The color tracking focusses on only a particular color, so that it detects the things which we don't want or the particular things we want(depends on the situation).The motion detection helps in video surveillance in some areas, crime investigating scenes.

There are 4 windows in total in the project.The whole project completely focusses on the security of the public based on motion and color.The project is completely based on cv2 and imutils libraries.

INTRODUCTION:

Object motion detection is the process of detecting a change in the position of an object relative to its surroundings or a change in the surroundings relative to an object.

Motion detection has attracted a great interest from computer vision researchers due to its promising applications in many areas, such as video surveillance, traffic monitoring.

Object colour tracking is one of the quickest and easiest methods for tracking an object from one image frame to next. The speed of the technique makes it very attractive for near-real time applications but due to its simplicity many issues exist that can cause the tracking to fail.

The easiest way to detect and segment an object from an image is the color based methods.

It is a critical part in many applications such as image search, scene understanding, etc.

RELATED WORK:

Many articles are there for object motion detection and for the color tracking but one of the most influencing article by Ashwin Pajankar took very important role for the project.

He mentioned regarding the uses of contours, HSV files in the image processing.

These articles became one of the best references for the project.

LIMITATIONS:

Only two colors are tracked in the color tracking process. Those are blue and green.

IMPLEMENTATION:

Contours:

Contours are defined as the line joining all the points along the boundary of an image that are having the same intensity. Contours come handy in shape analysis, finding the size of the object of interest, and object detection. OpenCV has findContour() function that helps in extracting the contours from the image.

HSV:

In color image processing, there are various models one of which is the hue, saturation, value (**HSV**) model. Using this model, an object with a certain color can be detected and to reduce the influence of light intensity from the outside.

HSV means Hue-Saturation-Value, where the Hue is the color. Saturation is the greyness, so that a Saturation value near 0 means it is dull or grey looking. And Value is the brightness of the pixel.

Imutils:

Imutils are a series of convenience functions to make basic image processing functions such as translation,

rotation, resizing, skeletonization, and displaying Matplotlib images easier with OpenCV.

Gaussian Blur:

Gaussian filters have the properties of having no overshoot to a step function input while minimizing the rise and fall time. In terms of image processing, any sharp edges in images are smoothed while minimizing too much blurring.

Morphological Transformations:

Dilation and erosion are the two common morphological operators.

Normally, in cases like noise removal, erosion is followed by dilation.

Because, erosion removes white noises, but it also shrinks our object. So we dilate it. Since noise is gone, they won't come back, but our object area increases.

Threshold:

For every pixel, the same threshold value is applied. If the pixel value is smaller than the threshold, it is set to 0, otherwise it is set to a maximum value. The

function cv.threshold is used to apply the thresholding. The first argument is the source image, which should be a grayscale image. The second argument is the threshold value which is used to classify the pixel values. The third argument is the maximum value which is assigned to pixel values exceeding the threshold.
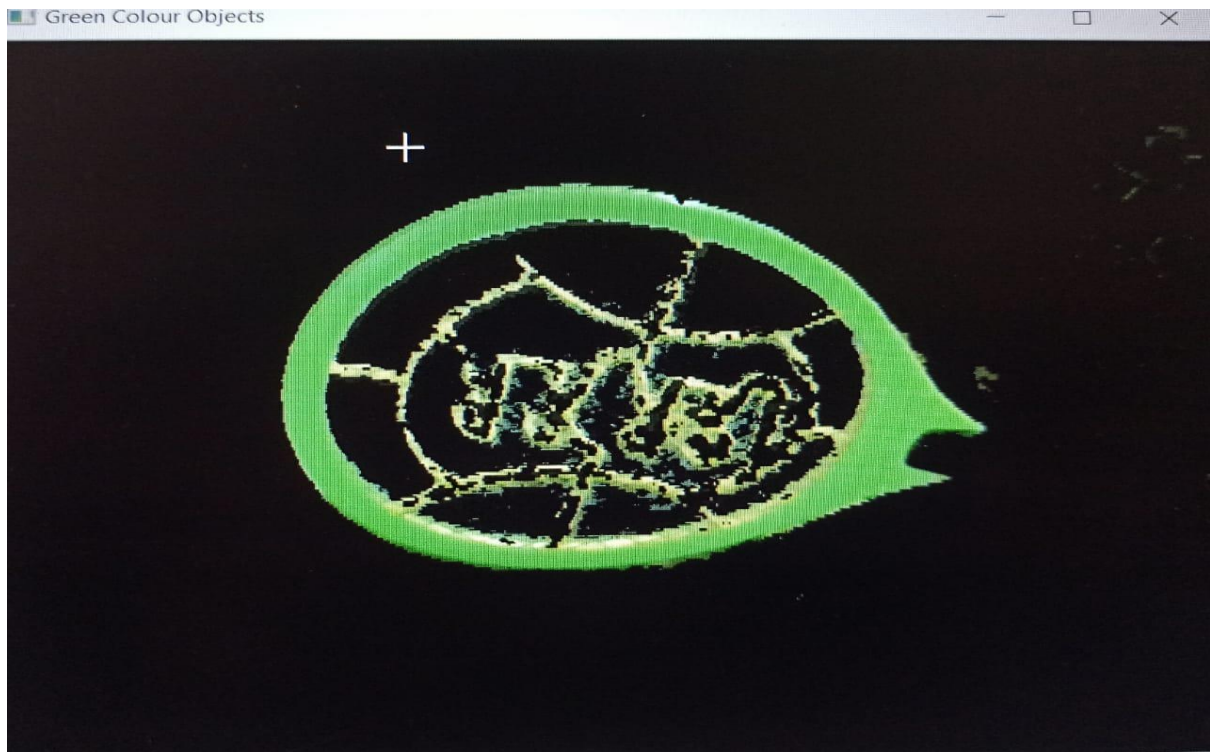
OpenCV provides different types of thresholding which is given by the fourth parameter of the function.
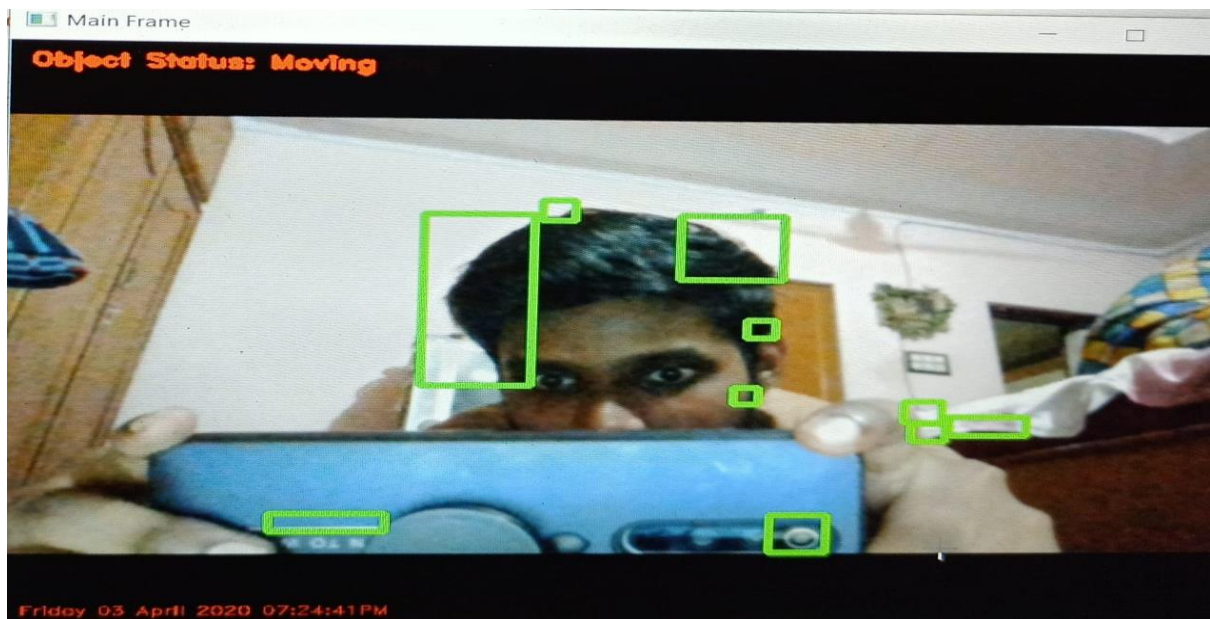
RESULTS:

Output windows:
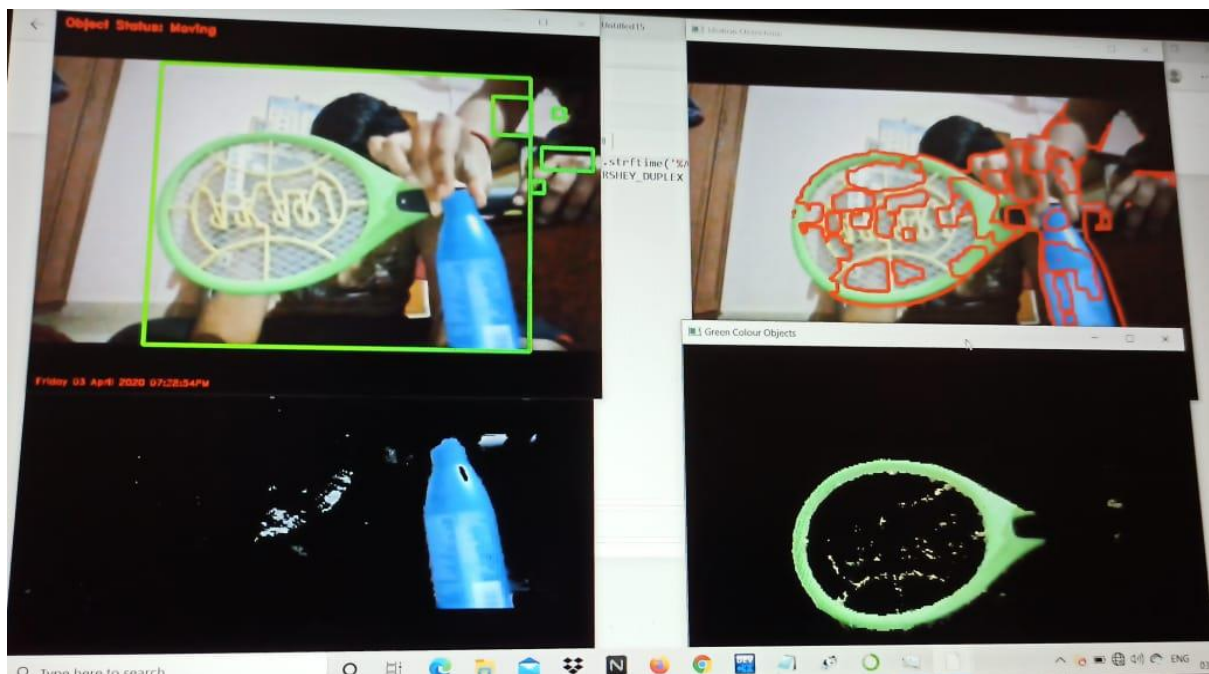
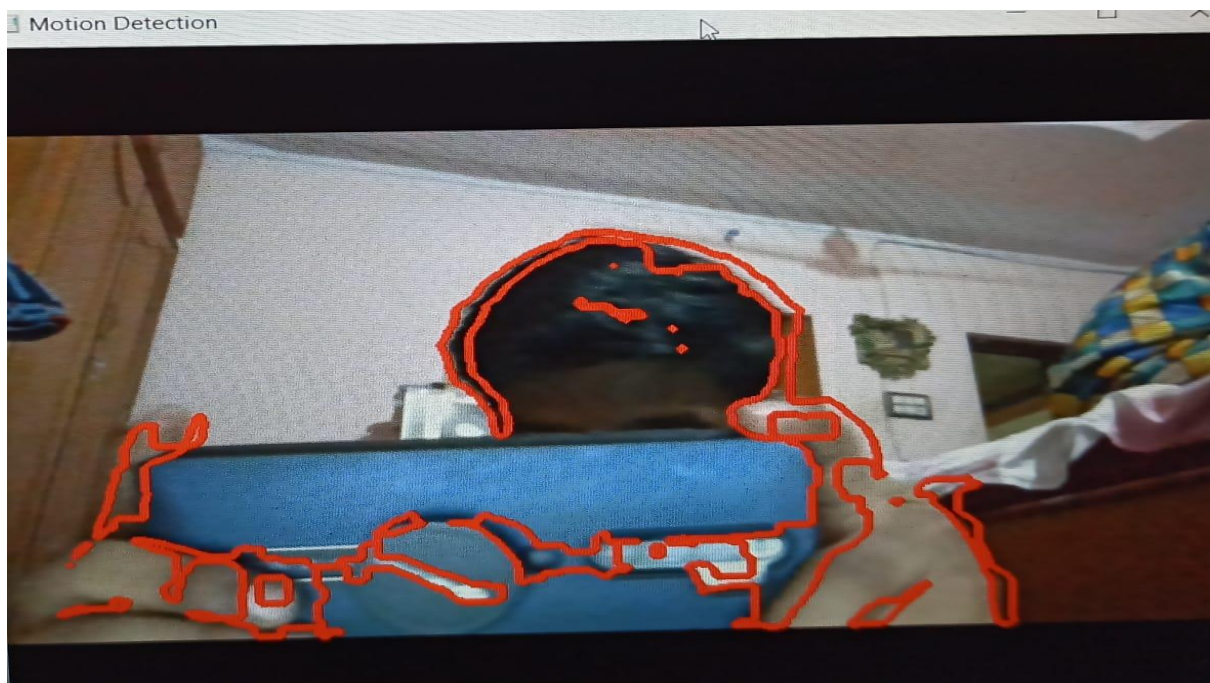# Green color tracking window:

Blue color tracking window:

Mainframe window:

Motion detection window:

IMPORTANT LIBRARIES USED:

cv2,time, datetime, imutils, numpy

TEAM RESPONSIBILITIES:

Main frame and blue color windows: Rv Rohith

Motion detection and green color windows: G Rohit

REFERENCES:

1.Scholarly articles :

https://scholar.google.co.in/scholar?q=object+motion+detection&hl=en&as_sdt=0&as_vis=1&oi=scholart

2. Youtube videos for the clarification of topics like threshold, dilate, eroded, HSV files.

https://www.youtube.com/watch?v=rbqA5UFXQoI&feature=youtu.be

3. Google websites:

https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_img proc/py_morphological_ops/py_morphological_ops.html