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## OBJECT DETECTION AND DIMENSIONING USING OPENCV

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**Abstract:** In these days of the 4th industrial revolution, real-time object detection and dimensioning is an important aspect from an industrial point of view. These are requisite topics of computer vision problems. This study presents an augmented technique for detecting objects and computing their real-time measurements from an IoT video device such as a webcam. We have suggested an object measurement technique in real-time using AI and IoT technologies like OpenCV libraries and webcam respectively. OpenCV includes many libraries and algorithms that are used. And we are using Algorithms like canny edge detection algorithm[2] and mobile/ web camera capture video in this paper.

**The Project has four stages:**

- (1) capturing image
- (2) object measurement process
- (3) save output
- (4) displaying output.

**Keywords:** Object dimension measurement, OpenCV, computer vision, Webcam, NumPy

### I. Introduction

“ Real- Time Object Dimension ” is a program that can be used to descry real- time object's confines. There aren't numerous real- time object dimension models and this prototype can be used tremendously further. This is an essential content of computer vision problems. As stated, this design presents a fashion for calculating the measures in real- time from images. To explain it's working it principally uses a webcam and a white paper background to descry the object. After detecting the object, it displays its confines in specified measuring units at real time. In the perpetration of the proposed fashion, we designed a system that used OpenCV software library. Some advantages of using this methodology are that it's veritably useful in the artificial field, it simplifies mortal work, and numerous further which are noted below in the advantages and disadvantages section. To calculate the size of each object, the prerequisite is that we need to determine the reference object[3]. In this case, it is, plain white paper. After that, the confines of the objects inside the reference are measured or it'll be calculated and hence the size of the object is displayed.

Before we dive into figure a state- of- the- art model, let us first try to understand what object discovery is. Let's( hypothetically) make a rambler discovery system for a tone- driving auto. Suppose your auto captures an image like the one below. How would you describe this image?

The image basically depicts that our auto is near a square, and a sprinkle of people are crossing the road in front of our auto. As the business sign isn't easily visible, the auto's rambler discovery system should identify exactly where the people are walking so that we can steer clear of them.

So what can the auto's system do to insure this happens? What it can do is produce a bounding box around these people, so that the system can pinpoint where in the image the people are, and also consequently make a decision as to which path to take, in order to avoid any mishaps.

This document is template. We ask that authors follow some simple guidelines. In essence, we ask you to make your paper look exactly like this document. The easiest way to do this is simply to download the template, and replace(copy-paste) the content with your own material. Number the reference items consecutively in square brackets (e.g. [1]). However, the authors name can be used along with the reference number in the running text. The order of reference in the running text should match with the list of references at the end of the paper.

## **Introduction to OPENCV**

OPENCV( Open Source Computer Vision Library) is an open source computer vision and machine literacy software library. OpenCV was erected to give a common structure for computer vision operations and to accelerate the use of machine perception in the marketable products. Being a BSD certified product, OPENCV makes it easy for businesses to use and modify the law.

The library has further than 2500 optimized algorithms, which includes a comprehensive set of both classic and state of heart computer vision and machine literacy algorithms. These algorithms can be used to descry and fete faces, identify objects, classify mortal conduct in vids, track camera movements, track moving objects, excerpt 3D models of objects, produce 3D point shadows from stereo cameras, sew images together to produce a high resolution image of an entire scene, find analogous images from a n image database, remove red eyes from images taken using flash, follow eye movements, fete decor and establish labels to overlay it with stoked reality, etc. OpenCV has further than 47 thousand people of stoner community and estimated number of downloads exceeding 18 million. The library is used considerably in companies, exploration groups and by governmental bodied.

Object Discovery is maybe the main disquisition exploration in computer vision[3]. Object discovery is a fashion that distinguishes the semantic objects of a specific class in digital images and vids.

One of its real time operations is self driving vehicles or indeed an operation for outwardly hindered that identifies and advise the devitalized existent that some object is before them. Object discovery algorithms can be insulated into the conventional strategies which employed the system of sliding window where the window of unequivocal size travels through the whole image and the deep literacy ways that incorporates YOLO algorithm. In this, our point is to distinguish multitudinous objects from an image. The most well known object to identify in this operation are the creatures, bottle, and people. For chancing the objects in the image, we use ideas of object localization to find further than on e object in real time. There are different ways for object identification, they can be separated into two groups, original bone is the algorithms dependent on groups

## II. MEHODOLOGY

To work with Static Tokens in a business climate, Deployment of business IoT items for use by end-client is a difficult cycle. Blink offers apparatuses to work on this cycle for producers, engineers, and end-clients.

There are three methods for acquiring Auth Tokens for your gadgets:

Physically : Typically utilized at prototyping stages or in non-business application.

Dynamic Auth Tokens : can be utilized for WiFi gadgets as it were Static AuthToken

In This task we are Using Static Tokens and guide you through the means expected at all stages - from assembling to conveyance of your gadgets into the client's hands.

Static Tokens are intended for non-wifi gadgets (cell, Ethernet, and so on.).

These gadgets can associate with the Internet naturally and require no extra client input (for example WiFi qualifications) to get online .Use-cases can be more extensive than this, obviously. For instance, your gadgets can interface with a portable (cell) area of interest utilizing hardcoded WiFi qualifications. In such cases, Static Tokens are pertinent also. At the point when you make another Static Token utilizing the instruments we offer, two related things are made: AuthToken (Device Token) and QR Token. Static Token generally has a place with a particular Device Template and explicit Organization. Every gadget on Blink stage has an Auth Token (Auth Token), likewise frequently called as Device Token. This is a special identifier of the gadget and it's utilized to verify, approve, and interface gadgets to Blink Cloud. Auth Token is expressed in the firmware code and is glimmered to the gadget before it is conveyed to the end client. Auth Token is normally not presented to the end clients because of safety explanations behind (a similar explanation you shouldn't show it for general visibility anyplace).

## Steps of designing the proposed model:

Download the conditions OpenCV and Numpy in IDE PyCharm. Import Open Cv as cv2 and numpy as np.

Compose a Flag or a piece of code with the end goal that it lets the webcam on or off. ( "webcam = False").

Catch the video. Set boundaries Width, Height, and Parameters.

Code of the multitude of settings required.

```
webcam=True
path='1.jpeg'
cap=cv2.VideoCapture(0)
cap.set(10,160)
cap.set(3,1920)
cap.set(4,1080)
scale=3
wP=210*scale
hP=297*scale
```

Subsequently settings are finished. Composing the code to quantify the picture.

Composing a python record (utlis.py) to track down the shapes and apply processes, as code, to the picture contribution to figure out the genuine opportunity object estimation.

Make a shrewd picture of the information picture. Apply enlargement and disintegration includes with the goal that the most common way of making a vigilant picture is smooth. Composing code to find the imperative of the white paper which is a square shape[1]. Applying channel as a square shape as the foundation white paper is square shape concluding the counters and adding the length and region. Consequently indicating the location of the white paper. Applying numerical ideas and with the assistance of a watchful picture measure the item put on the white paper. Applying an arrowed line and put text to show the assessed estimation of the item.

### III. SOFTWARE DESCRIPTION

PyCharm is the most famous IDE utilized for Python prearranging language. This section will give you a prologue to PyCharm and makes sense of its elements.

PyCharm offers probably the best highlights to its clients and designers in the accompanying angles:

Code finish and review

Progressed investigating

Support for web programming and systems like Django and Flask

Elements of PyCharm

#### FEATURES OF PYCHARM:

Furthermore, a designer will find PyCharm agreeable to work with in view of the highlights referenced underneath

##### Code Completion

PyCharm empowers smoother code finish whether it is for implicit or for an outside bundle.

##### SQLAlchemy as Debugger

You can set a breakpoint, stop in the debugger and can see the SQL portrayal of the client articulation for SQL Language code.

##### <sup>2</sup> Git Visualization in Editor

While coding in Python, questions are typical for a designer. You can check the last commit effectively in PyCharm as it has the blue areas that can characterize the distinction between the last commit and the ongoing one.

#### IV. BLOCK DIAGRAM

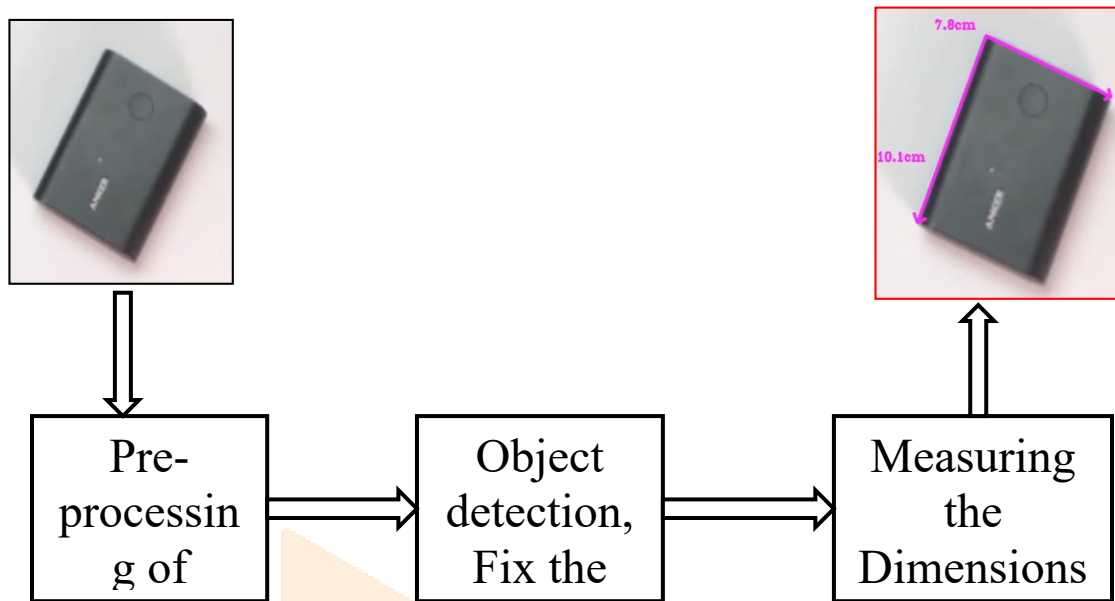


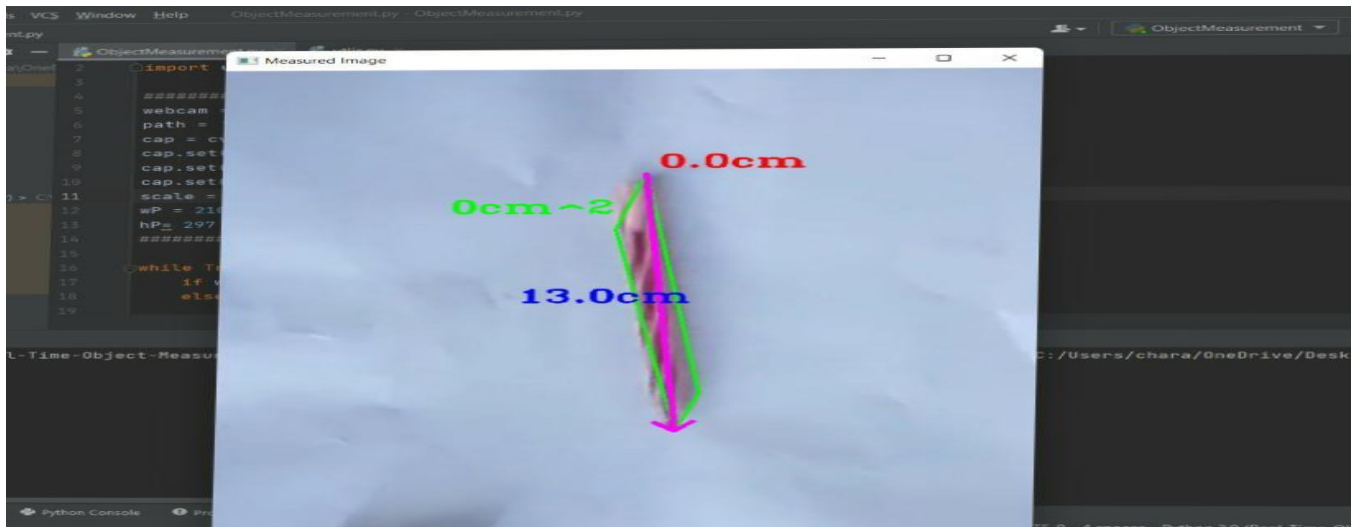
Fig: Block diagram

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associate with that image. Usually Image Processing system in-clades treating images as two dimensional signals while applying already set signal processing methods to them.

Image processing basically includes the following three steps:

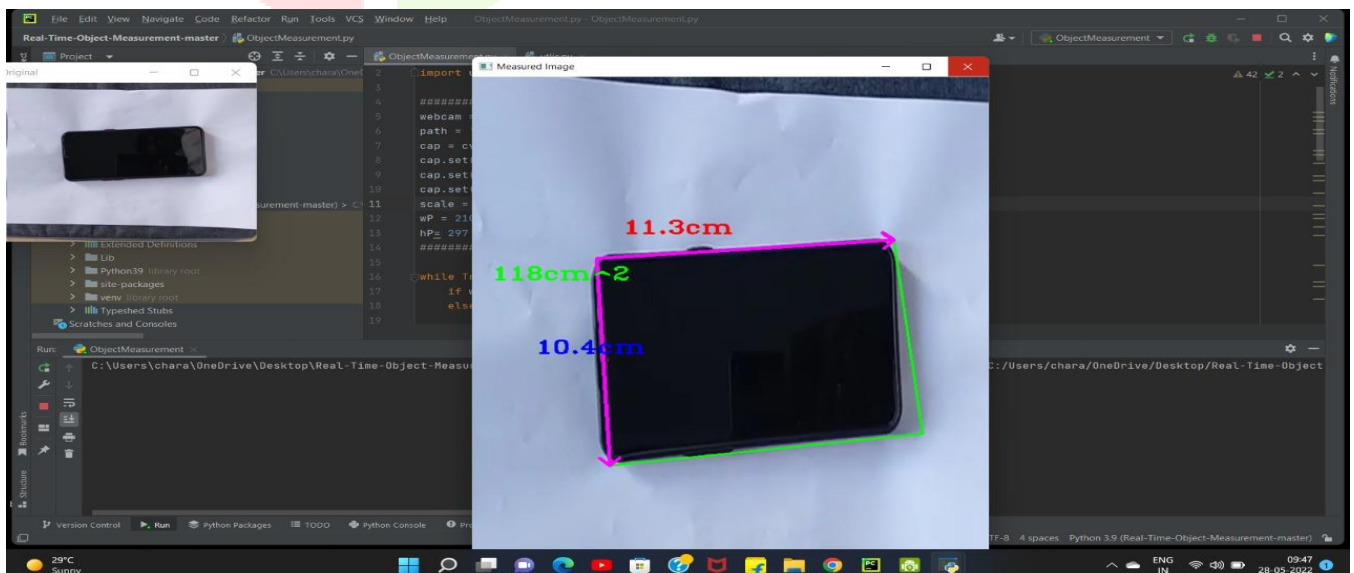
- Importing the image with optical scanner or by digital photography.
- Analyzing and manipulating the image which in-cludes data compression and image enhancement and spotting patterns that are not to human eyes like satellite photographs.
- Output is the last stage in which result can be altered image or report that is based on image analysis.

## V. RESULTS



**Image 5.1**

This image shows the dimensions of the taken input which is a pen and in a spherical shape. When the object is detected with the help of canny algorithm which helps in finding edges of an given object, measurements of the object will be displayed accordingly with given input. The results that is displayed in above image is in centimeters and area is in  $\text{cm}^2$ .



**Image 5.2**



The above image shows the dimensions of a taken image, in which the dimensions are in centimeter and area is displayed in  $\text{cm}^2$ . As we took the input as a mobile phone, the image dimensions will be more accurate than any other input because it is in black color, as we took reference as an A4 sheet, we should keep the input object on the A4 and should scan with mobile camera or web camera.

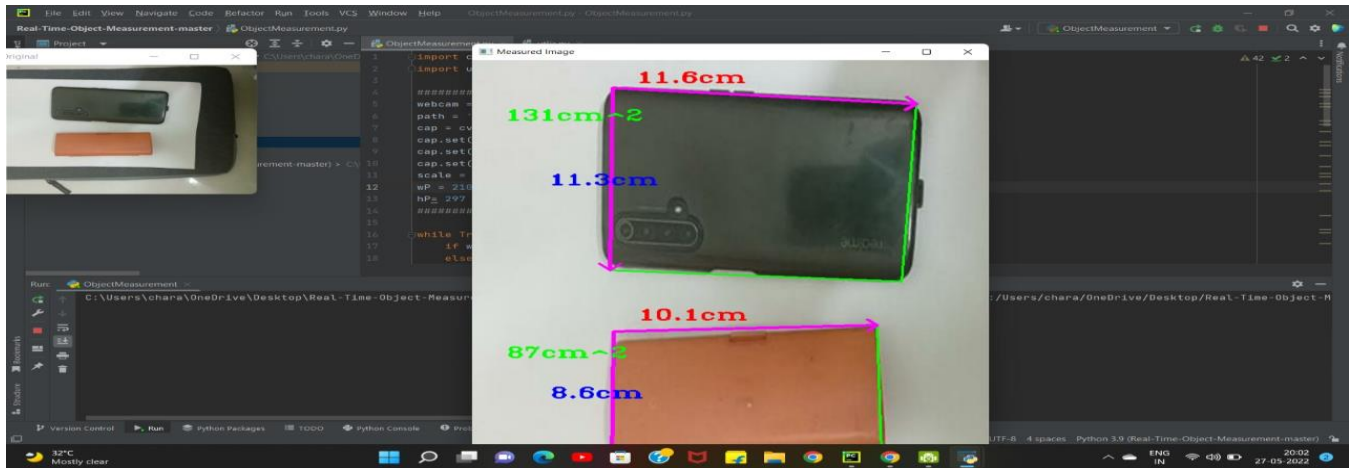


Image 5.3

As we took only one input in above images [5.1 & 5.2], now we took multiple inputs in a single frame to get the dimensions of them. As we can see that we took a wallet and a mobile phone in which it shows the dimensions of the object in centimeters. As we can take reference from [2], in which he described about detection of multiple objects in a single frame. Using canny edge detection[4] algorithm we are able to get dimensions for multiple objects.

## VI. CONCLUSION

Because of this framework, numerous enhancements can be made to the modern area[8]. The task effectively gauges the elements of the article progressively. Consequently the PC vision (webcam gadget and code) is utilized to gauge the aspects progressively. It catches the picture from the real-time video casing and afterward shows its aspects. A Canny edge locator is effectively used to identify the aspects[2]. This procedure works quick and enjoys many benefits and remarkable highlights that can be carried out in reality.

## VII. REFERENCES

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