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Real Time Object Measurement System

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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 anobject 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 in this project. The technique has four stages: (1) capturing image object measurement process (3) save output (4) displaying output.

***Key Words*:** Object dimension measurement, OpenCV computer vision, Webcam, NumPy

1.INTRODUCTION

"Real-Time Object Measurement" is a program that can be used to detect real-time object's dimensions. There are not many real-time object measurement models and this prototype can be used enormously further. This is an essential topic of computer vision problems. As stated, this project presents a technique for computing the measurements in real-time from images. To explain it's working it basically uses a webcam and a white paper background to detect the object. After detecting the object, it displays its dimensions in specified measuring units at real time. In the implementation of the proposed technique, we designed a system that used OpenCV software library.

Some advantages of using this methodology are that it is very useful in the industrial field, it simplifies human work, and many more 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. In this case, it is, plain white paper. After that, the dimensions of the objects inside the reference are measured or it will be calculated and hence the size of the object is displayed.

I. ADVANTAGES AND DISADVANTAGES

Advantages:

- It reduces man error and increases proficiency.
- It can be used easily.
- Less error is directly proportional to more profit.
- Not expensive that is it is low cost only a webcam isrequired
- Saving output.

Disadvantages:

- Saving output.
  The output given does not get backed up in any record hence there is a need for a backing system.

II. FEATURES OF PROJECT

- It is a more convenient way to take measurements.
- Easy implementation
  Has a better future scope
- It has accuracy.
- Fewer chances of human error.
- It will save money on instruments that we normallyuse to take measurements.
- It is easy to use and will save time and effort.

III. PLATFORM OR

TECHNOLOGY USED:

PyCharm

- It is an IDE (integrated development environment)specifically used for the python language.
- PyCharm is easy to use. It supports OpenCV and allits libraries once dependencies are installed.
- Supports all frameworks.

OpenCV

- It is an open-source library used in computer vision,machine learning, image processing.
- There are various applications and functionality ofOpenCV which makes it versatile.

NumPy

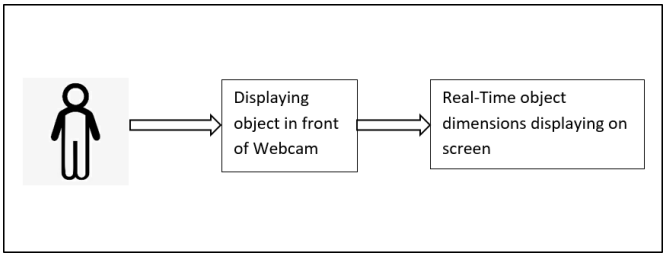
- It is a python library. It is basically used to do mathematical operations and it is easy to work with arrays.

- It is easy to use and gives excellent results. It can perform great mathematical operations.

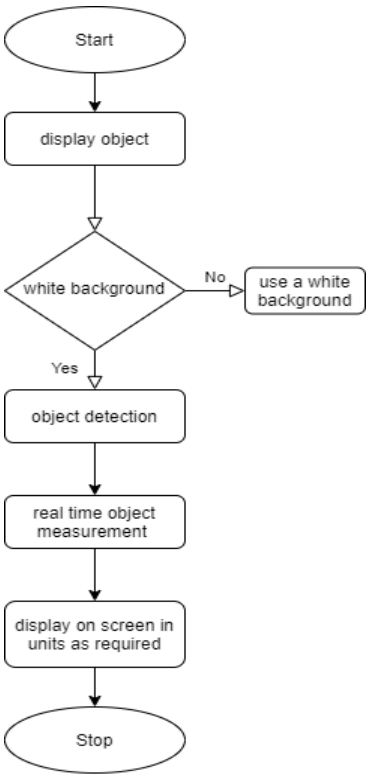
IOT Device-Webcam

A device with various applications. Webcam with a mid-level pixel reading ability is perfect. Device driver software needs to be installed and should work well for the program to be executed

BLOCK DIGRAM AND FLOWCHART:



The block diagram represents the basic working of the projector system.



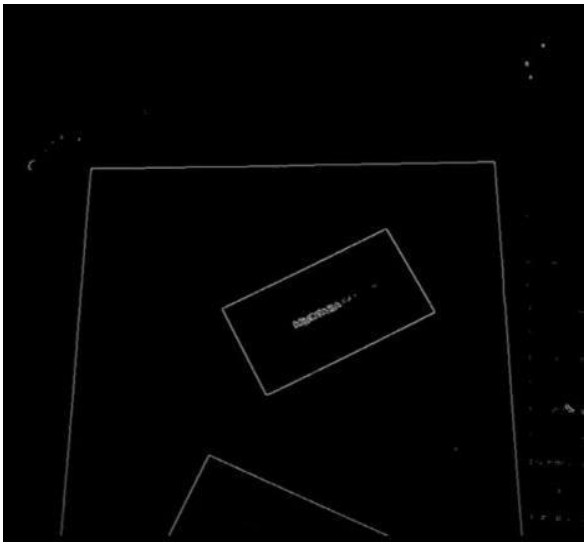
- canimage of the input image. Apply dilation and erosion features so that the process of creating a canny image is smooth.
- Writing code to find the constraint of the white paper which is a rectangle.
- Applying filter as a rectangle as the background whitepaper is rectangle. Finalizing the countors and appending the length and area. Hence specifying the detection of the white paper.
- Applying mathematical concepts and with the help ofa canny image measure the object placed on the whitepaper.
- Applying an arrowed line and put text to display the estimated measurement of the object.

Steps of designing the proposed model:

Download the dependencies OpenCV and Numpy in IDE PyCharm. Import Open Cv as cv2 and numpy asnp.Write a Flag or a piece of code such that it lets the webcam on or off. (“webcam = False”). Capture the video. Set parameters Width, Height, and Parameters.

- Code of all the 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*sc
  ale
  hP=297*sca
  le
- Hence settings are done. Writing the code to measure the image.
- Writing a python file (utlis.py) to find the contours and apply processes, as code, to the image input to find the real-time object measurement.

Canny image after applying dilation & erosion operation



EXPERIMENTAL RESULTS AND ANALYSIS

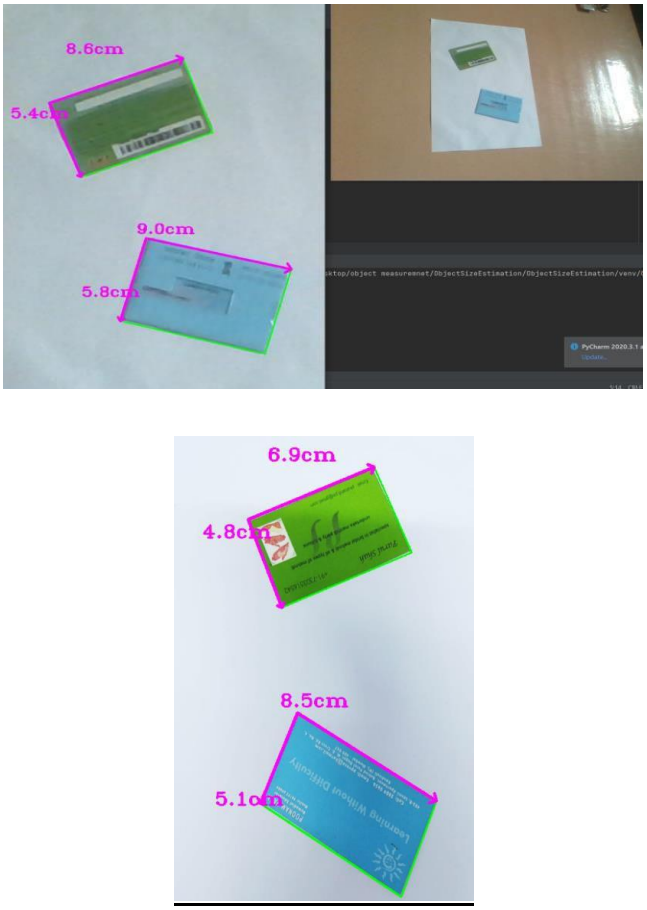


Fig. 04 Experimental Screenshot

In Fig. 04 the screenshot is taken while performing it live and the screen appears to be as such. The dimensions of the objects are recognized and are shown in units cm. the right side is the live video frame of the object

BEFORE MEASURING

As displayed in Fig. 05 the system captures the image as such and then performs object measurement.

CONCLUSION AND FUTURE SCOPE:

IV. Conclusion:

As a result of this system, many improvements can be made tothe industrial sector. The project successfully measures the dimensions of the object in real-time. Hence the computer vision (webcam device and code) is used to measure the dimensions in real-time. It captures the image from the real- time video frame and then displays its dimensions. A Canny edge detector is successfully used to detect the dimensions. This technique works fast and has many advantages and salient features that can be implemented in the real world.

Future Scope:

Machines are used in every part of human life. Machines workaccording to us but in today's world, we work according to machines. The rush to soar high is immense. Hence, machines are important and so are the parts of them. If the parts do not fit well a machine cannot work properly. The dimensions ofthe objects sure make a great impact. This AI IOT basedproject will help in measuring the dimensions in real-time. It isconvenient and easy to use. It also gives accuracy and

assurance of the manufactured product. As it is a one-timeinvestment it surely has a great future scope.

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