

DETECTION OF STANDARD DIMENSION OF NUT AND BOLT AND THEIR SEGREGATION

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Abstract: Most of the Industries are growing faster these days and they need most accuracy results in every product they develop. Especially in the automotive mechanical industries which manufacture nuts and bolts. There is need to design a system that is recognises the nuts and bolts and it's dimensions. For these type of segregation and detection the most prominent technology that is " CONVOLUTION NEURAL NETWOK" algorithms are used by the most of the industries. When coming to CNN it is a type of artificial neural network used for image recognition , image processing and specifically designed to process pixel data.

INTRODUCTION

By Natural logical thinking humans can recognize the objects surrounded in their vision of comfort. But the challenging task is that they cannot specifically identify the particular type of object and it's dimensions and their segregation . when coming to our project we have used nut and blot to find the exact dimension and their segregation using ANN of CNN.

As we know their are lot and many more types of nut and blots and it's known that it is very crucial to find their exact dimension and particular type to identify by humans. So by using convolution algorithm we will train the system . In CNN we have 3 types of layers convolution layer, pooling layer , fully connected layer .

To capture the image use the camera . after uploading the image , image processing technique will apply on the image . after that the edge computing will apply on the image and further classification algorithm will apply . finally it will display the name of the nuts and bolts of the uploaded image .

The second feature is to identify the exact dimensions of the nuts and bolts. For this use the opencv technique and apply on the image.

EXISTING SYSTEM AND PROPOSED SYSTEM

EXISITING SYSTEM

In existing system , the system will separate nuts and bolts according to its types. Machines are made up of various parts to extract the image from an object to solve the same task. To solve the problem, a branch of engineering and technology is used called as computer vision.

These images are then stored in the memory of computer which are further used for process of recognition. the nuts and bolts are transfer on the conveyer belt after the production has been done. This paper is used for the application that separates the nuts and bolts and gives the output as the separated nuts and bolts.

PROPOSED SYSTEM

In proposed system , the first feature, the system will tell the name of particular type of the nuts and bolts. By using the camera will upload the image, after applying the image processing technique by using the edge computing will identify the name of the nuts and bolts.

The second feature, the system will display the exact dimensions of the nuts and bolts by using the OpenCV algorithm.

PROPOSED SYSTEM IMPLEMENTATION

First we will capture the image and upload into the app or website. To capture the image use the camera. After uploading the image, image processing techniques will be applied to the image. Then edge computing will be applied to the image, and finally a classification algorithm will be applied. Finally, it will display the name of the nuts and bolts of the uploaded image.

We use Keras libraries in the program of image processing technique and also we will import TensorFlow. TensorFlow is an end-to-end open source platform for machine learning. TensorFlow provides a collection of workflows to develop and train models using Python.

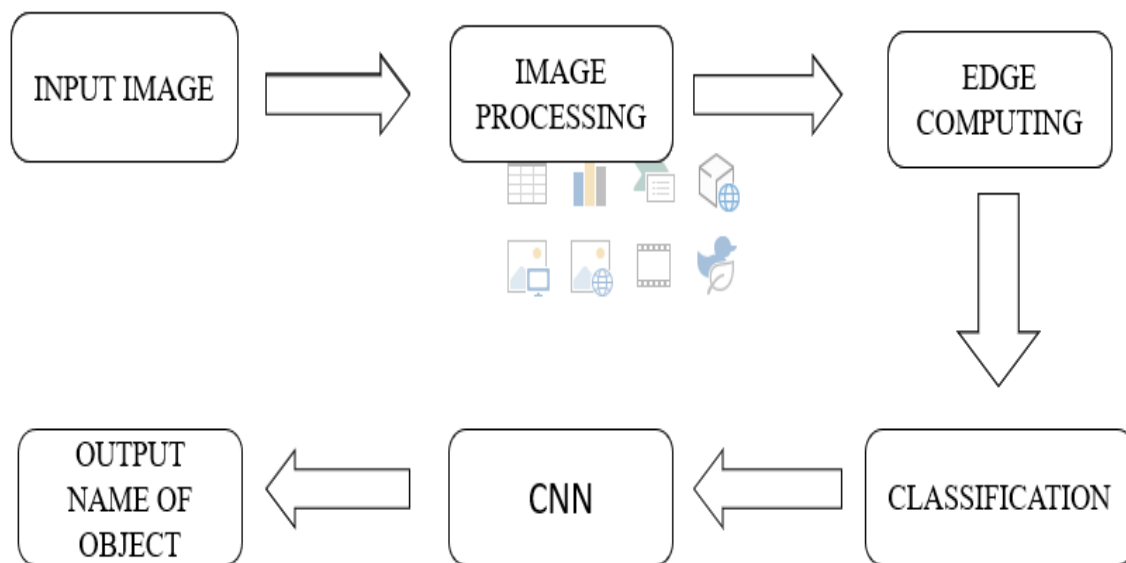


Figure . 1 Flow chat of working

Second feature, Measuring the size of nuts and bolt using OpenCV. The size of an object in an image, we first need to perform a “calibration” using a reference object. Our reference object should have two important properties:

- **Property 1:** We should know the dimensions of this object (in terms of width or height) in a measurable unit (such as millimeters, inches, etc.).
- **Property 2:** We should be able to easily find this reference object in an image, either based on the placement of the object (such as the reference object always being placed in the top-left corner of an image) or via appearances (like being a distinctive color or shape, unique and different from all other objects in the image). In either case, our reference object should be uniquely identifiable in some manner.

During implementation, we load our image and preprocess it. After loading our image from disk, convert it to grayscale, and then smooth it using a Gaussian filter. We then perform edge detection along with a dilation + erosion to close any gaps in between edges in the edge map. After that, it will calculate the size of the nuts and bolts.

After applying of all the algorithms it will display the dimensions of the nuts and bolts on the display.

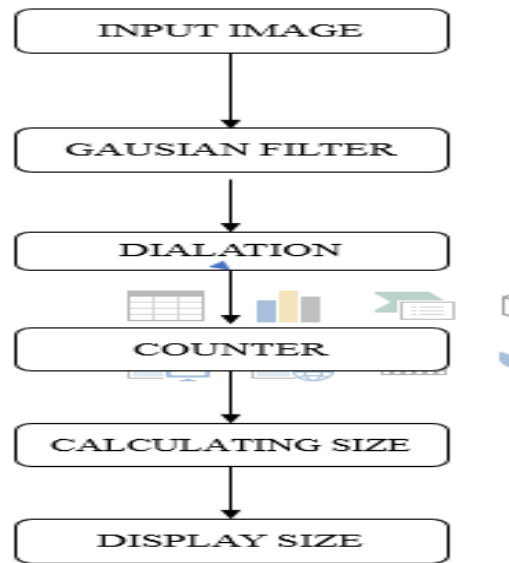


Figure. 2 flow chat of working

RESULT

Result of the first feature

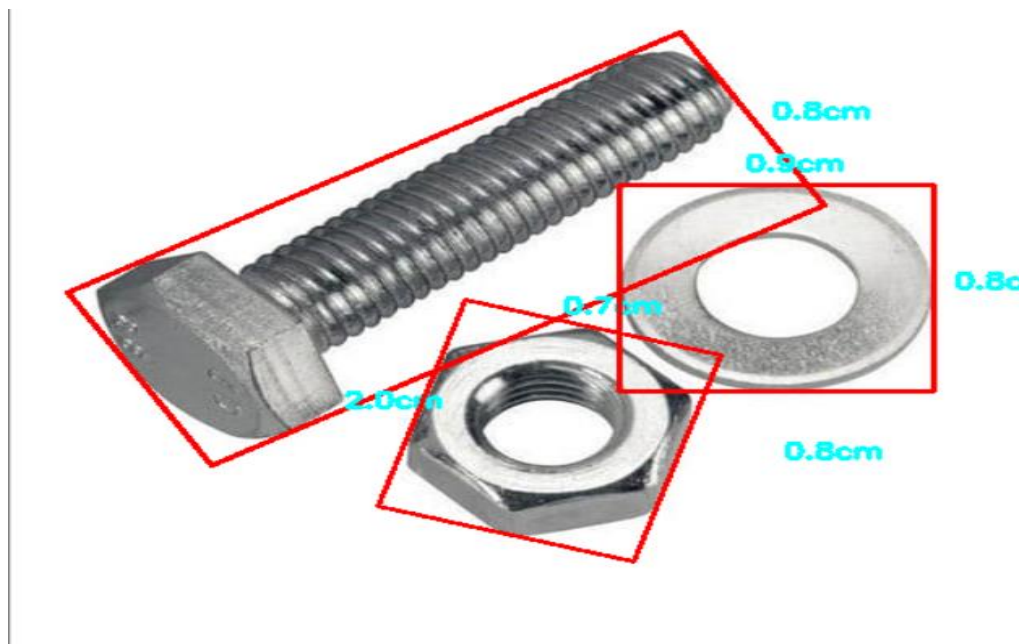
Input image :-



Output :-



Result of second feature



CONCLUSION

In this paper, the system has two features. The first feature is to display the name of the particular type of nuts and bolts, which is very easy for workers to identify the type of the nut and bolt during the implementation of hardware. Here, by using the CNN algorithm, the names of nuts and bolts are identified.

The second feature is that the system will display the exact dimension of the nut and bolt. Because of this feature, the work will be completed within time without any confusion regarding the size of nuts and bolts. It is very helpful for the workers, especially those who are working in the hardware industries.

The identified objects are distinguished by the size of the object area displayed and the co-ordinates. Here, by using the OpenCV, this system is implemented.

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