Automatic Object Detection and Dimensional Measurement of Object Using Image Processing

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Abstract:- In this days, automatic object detection and dimensions measurement is an important issue from so many small scale industries. It automatically measured size of object with their high accuracy by structure of light is based on system of camera.Using the different types of algorithms as well as morphological operation and the combination of hardware and software. This is the vital topic of computer vision problems this study present an enhanced technique for detecting object dimension of the object. Quality of the product is becoming necessary and demands high precision with accuracy for each atom. The approach includes six steps namely (1) Training Image, (2) Image segmentation, (3) feature explanation, (4) Testing of Image and the last is (5) Classification. The grey scale image are firstly aligned in the preprocessing step. In the implementation of the purposed technique, we designed a system that used MATLAB software, CCD/Web Camera. It nearly achieved 98% success in determination to size of object.

Keywords:- Object detection, dimensions measurement.

I. INTRODUCTION

In this days, automatic object detection and dimensions measurement is an important issue from so many small scale industries. Because quality of the product is becoming necessary and demands high precision with accuracy for each item. The small scale industry cannot invest the use amount of latest technology. They follow only traditional technique traditional instrument and they have limited capital for expansion. This traditional/old technique are time consuming.

Manufacturing industry look and the some challenges as they have to deliver product at consistently high quality standards, navigate end-to-end supply chains and manage strict to market deadline driven by demanding customers are highly sensitive to time, cost, and quality. Study puts efforts in effectiveness and accuracy for better quality through Automatic image analysis is one of the basic approaches in the field of industrial application, among other for inspection, measurements or object detection. Nowdays, object detection and dimension measurement of object is major issue for many small scale industry. That's why we trying to overcome this challenge faced a small scale industry. And we develop a project is "Automatic Object Detection and Dimensional Measurement Using Image Processing".

II. LITERATURE REVIEW

- Nashwan Adman Othman, Mehmet Umut Salur, Mehnet Karakose, Aydin all are form computer engineer They are belongs to Elazig and sanliurfa in Turkey country. They design a project on embedded real-time object detection and measure the size of object. They use latest technology for detecting the object and measure the size in real time for this purpose they use video of object. For object measurement technique by using video they use various algorithm like OpenCV libraries include canny edge, detection, dilation, and erosion. And making a video and implementation of technique they design a system with the help of OpenCV, software library, Raspberry pi 3 and Raspberry camera.

- Cuong Vo-Le, Pham Van Muoi, Nguyen Hong Son, Nguyen Van San, Vu, Khac Duong and Nguyen ThiHuyen they all are from electronics and telecommunication department of Hanoi University Vietnam. Title of their project is Automatic Method for Measurement Object Size Using 3D camera Main purpose of their project is measure size of object with high accuracy using stereo camera system. This project is divided into four steplike preprocessing, object detection, key points extraction and depth interpolation before size calculation. Then, the project is detected by depth threshold and key points are extracted by Shi-Tomasi corner detector combined with our proposed key points extraction algorithm.

III. OBJECTIVE

A. To detect the object:
Project quality in industry depends on quality of project. The system can be used and applied to an industrial quality control of the system. Our proposes system is helpful to detect the object by using different image processing techniques, so we first detect the object and apply various image processing techniques.

B. Study various defects:
The detection of products defect is essential in quality for manufacturing industry.

The main task is to detect surface irregularity means check whether surface is smooth or rough also identities the cracks on surface of project. In many industries manual inspection of large metal surface is still in use even though is the precision of this method is restricted. Then the quality requirement of the object have increased the particular with respect to homogeneous flatness. It is used to detect the surface and internal defects of projects. It is refers to detect

of the spot, pit, scratch, color difference and defects on the product surface.

C. Identify problems faced by manufacturing industry:

To report third party and provide in time delivery having good quality of the product. We identify different quality relevant problems such as meet the standard dimensions requirements as per product quality. Hence working is continuous and provide effective strategies.

D. Reduce rejection of a product:

The rejection level can be reduced by implementing the step by step approach in a manufacturing processing providing good quality products which meet the standard requirement of venture. This will result in reduction of rejection and rework.

IV. METHODOLOGY

The proposed of model estimation the object detection of individual objects from 2D images. This system is build using object detection and dimensional measurement of object detection. Initially, the methodology was developed using only a single view of the object, however all the necessary dimensions of the object cannot be computed using only one view. So, the proposed model employs the use of two views (any combination of front, top or side view) depending upon the application. To avoid distorted dimensions and obtain improved accuracy, image required object are captured at a 90^0 viewing angle with respect to the camera. At the present, the model is built for the following object: Bricks, cube, paper.

The model consists of following tasks: object recognition, dimension calculation.
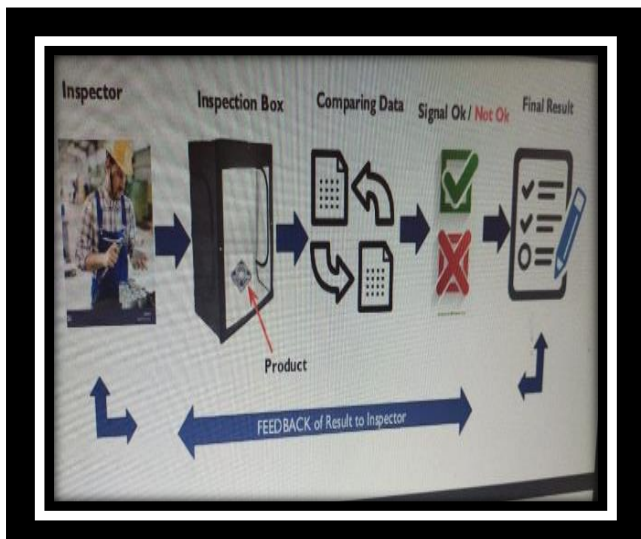
The process of this method automatically measuring the object size based on image processing. The approach includes six steps namely inspector, inspection box, comparing data, signal object ok / not ok, result and last step transmit feedback of the result to the Inspector.

- **Inspector**: It is a first step of methodology. A inspector monitors the quality aspects of incoming product.

- That ready to be shipped. He will be decide the product is going to be tested. The newspaper (length, breath, width, diameter, surface).
- **Inspection Box**:Then inspection box collect the info all tested data of the product is transmit to the next block.
- **Comparing data:** Compare the tested data of the object with standard data tested data of the object which is already stored in data base. After compression this compared data transmit to the signal box.
- **Signal** : The function of signal box is if tested data of the product is match with standard data of the product with zero tolerance then tested product is OK otherwise if tested data of the product dose not match with standard data of the
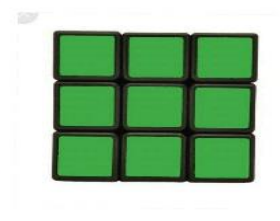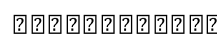

product with -1 to1 tolerance then tested product is not ok.
- **Result**: Then last step is final result of that product is transmit to Inspector .

Fig. A Cube

Fig. B Brick

V. FLOW CHART
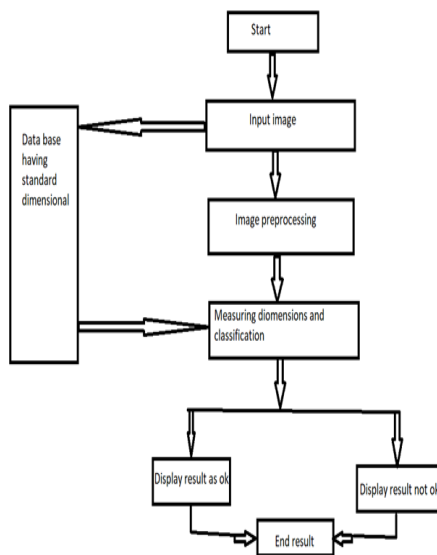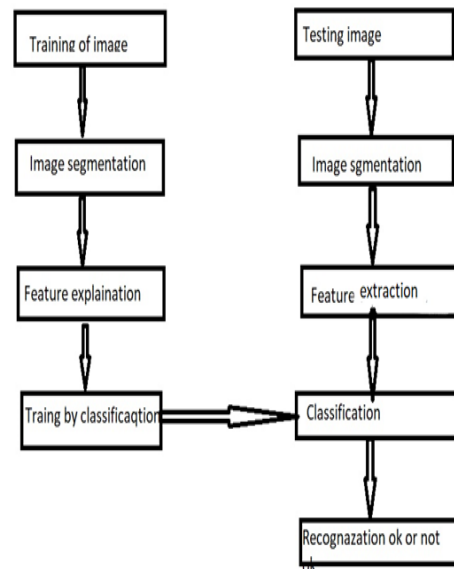

Fig. 1: Flow Chart

- **Training image**- A bunch of image for which the required outcome is know for which the required outcome is known. You input them to a program that analysers their features through a classification routine that determines the appropriate data to use on the features in order to best achieve the required result.
- **Image segmentation**- It is a method in which a digital image is broken down into various subgroups. **-** image segmentation is a commonly used technique in digital image processing Image segmentation is the process by which a digital image is Partitional into various subgroups (of pixel) called image objects, which can reduce the complexity of the image, and thus analysing the image become simpler.
- **Feature explanation**- In computer vision and image processing, a feature is a piece of information about the content of an image.In computer vision and image processing, a feature is a piece of information about thecontent of an image; typically about whether a certain region of the image has certain properties. Features may be specific structures in the image such as points, edges or objects.
- **Testing of image**- Compare the two different images.A standard test image is a digital image file used across different institutions to test image processing and image processing and image compression algorithms. By using the same standard test images, different labs are able to compare results, both visually and quantitatively.
- **Feature extraction**- Feature extraction is a part of the dimensionality reduction process.
- **Classification**- Image classification is a complex procedure which relies on different components. Digital image classification uses the spectral information represented by the digital numbers in one or more spectral bands, and attempts to classify each individual pixel based on this spectral termed spectral pattern recognitions. Two general methods of classification are 'supervised' and 'unsupervised'.

Fig. 2: Block Diagram

VI. CONCLUSION

Now days object detection and dimension measurement of object is major issue for many small scale industry.

So, that trying to overcome this challenges faced a small scale industry.

So, we are developing the Automatic Object Detection and Dimensional Measurement using image processing. Manually operated instrument for dimension inspection which is caliber and time consuming which affect to overall industrial manufacturing process. Hence it is prepared of developing "*Automatic Object Detection and Dimensional Measurement Using Image Processing*" which will be more precise for batter quality produces.

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