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Supermarket Billing System Using Webcam

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Abstract: ***We generally go to supermarkets to purchase the essential needs such as groceries which are required for our day to day life we see that the billing in supermarket is done by scanning the barcode which is present on the product, due to this the billing process consumes lot of time and even the customer has to wait longer time in the line at the counter when there are some issues in scanning the barcode. So in order to solve the issues the billing system using webcam has introduced where it is implemented with some added functionality to traditional supermarket billing. This system is faster bill generation for customers. With the of webcam the system captures the images of the product and gives the information of the product such as name and price of the product and calculates the bill quickly. By this system we can reduce the time and increase the accuracy.***
Keywords: Barcode, opencv, webcam.

I. INTRODUCTION

In this modern era, the people have income time to spend and less time to spend. So they generally opt for supermarkets for groceries. Supermarket is the place where the consumers come to purchase their daily using products and pay for that.So there is need to calculate how many products are sold and to generate the bill for the customers. We can see that the barcodes are widely used in many grocery supermarkets for billing. These barcodes are placed on each and every product that is available in the supermarket. After picking up the required items the customer goes to the check -out counters ,they scan the barcode on the products to calculate the bill for the customers. Every product has to be scanned separately consuming huge time and consumes lots of time of the customers. Particularly in huge stores whenever many customers comes for looking in exceedingly a day and thousands of products have to be compelled to be scanned. This makes the task difficult for the human workers and even the long queues of shoppers are seen at the stores. In several cases, the barcode is either broken or even there is also downside in reading barcode, because of lighting effects ,low resolution etc. A barcode based billing is also expensive as it requires laser light for barcoding of all the products. Supermarket billing system using webcam deals with the automation of supermarket. This will help user to work in a highly effective and in a friendly environment. The billing consumes considerably less time and energy of the customers. This system is implemented by considering the predefined images of the products that comes to the supermarket and are stored in the local system. Opencv and other python libraries for the identification of images are used in this system. The webcam will capture the images of the products when the customer comes for billing. After capturing the images of products, it will find the objects which are predefined then it compares with the stored images, the software part will calculate the bill. The supermarket billing system using webcam is built to help supermarkets calculate and dispalys bills and serve the customers in a faster and efficient manner. So the customer need not to wait for longer time in the queue for the billing process. Supermarket billing system using webcam is developed with the objective of making the system reliable, easier, fast and more informative.

II. RELATED WORK

Object detection and tracking are the two main tasks in multi camera surveillance. A new object detection algorithm using mean shift (MS) is introduced. The detected objects are then tracked by a new object are then tracked by a new object tracking algorithm using a Bayesian kalman filter with simplified Gaussian mixture(BKF-SGM).A new BKF-SGM is improved with MS algorithm a more robust tracking performance is obtained. The experimental results shows that the proposed object detection algorithm yields improved results over conventional object detection methods and the proposed tracking algorithm can successfully handle complex tasks with good performance. Image processing techniques minimizes the manual tasks of recognizing .In this ,an image processing system for automatic segmentation and prediction is proposed on the basis of color and shape features are being performed .Opencv python software is used to perform the required image processing operation. Object detection and recognition is the primary and foundation for intelligent service to understand the surrounding environment and make decisions. Here ,aiming at the accuracy and real-time performance of object detection and recognition of service in complex scenes, an end to end object detection and recognition algorithm based on deep learning is proposed . The deep convolution neural network is adopted to enhance the feature representation capability of the model by enhancing the convolution module function.

When the local features and global features are fully fused ,the natural multi scale detection recognition is realized on multiple receptive fields. The results shows that the algorithm has both good accuracy and real-time performance.

III. METHODOLOGY

Capturing the images of the products and training the system to identify the product and display the details of the product when they are brought for billing. The system is trained by using various python libraries. The system components of supermarket billing system using webcam are as follows

1) *Collecting the Images of Products:* Images of the products are stored in local system. Images of a single product is taken by varying the scale and orientation. Product details are added such as name of the product,price and discount.
2) *Train the Model:* Train the model with the help of opencv library for product identification when the product is placed in front of the webcam for billing and displaying the details of the products.
3) *Bill Generation:* Add or remove the products into/from the basket and generate the total bill.

IV. RESULTS

The process goes as follows first the webcam is opened to capture the images of the products. The images of the product are stored in the local system by varying the orientation of the products. Details of the product such as name and price of the product are also added. The model is trained by clicking the train model button with the collected images of the product for Detecting the products when it is placed in front of webcam for billing. Now show the product that are trained and purchased by the customer in front of the webcam .Click add/remove from the basket button. Then the system identifies the products and displays the name and price of the products in the text area Displays the total amount for the customers. If the customer wants to remove the product from the basket. Then the product is shown again to the webcam. Click add/remove product from basket button. Then it successfully removes the product from the basket. Displays the total bill for the customers.

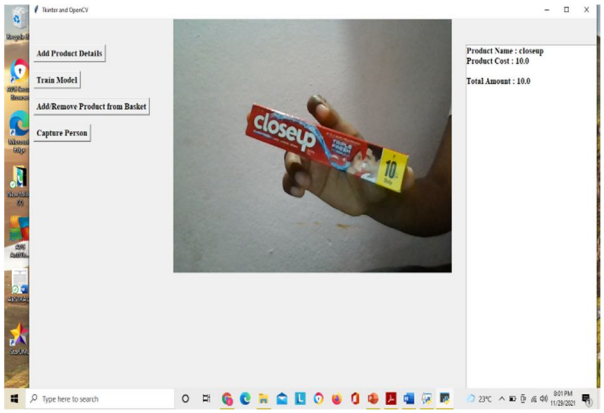

Fig 1:showing the product to the webcam and displaying the bill

V. CONCLUSION

The supermarket billing system using webcam aim is to make a system that is useful to the retail shop by reducing time consumption in bill counter. No need for specialized hardware for installing the system the classroom. It can be assembled using a camera and computer. This system is advantageous over barcode billing system .This method is accurate enough and reliable. In this project with the tremendous use of TensorFlow, the object detection is done. And every method has its own advantage and disadvantage. But in this we tried to overcome the existing system problems. When compared to the other system the proposed system has more advantages and secure as we make change only in the billing process. Using this system both costumers and management will get a better shopping experience. The experiment results can be shown that the system can achieve high precision counting and high recognition accuracy.

A. Conflict Of Intrest

The authors declare that they have no conflict of intrest to report regarding the present study.

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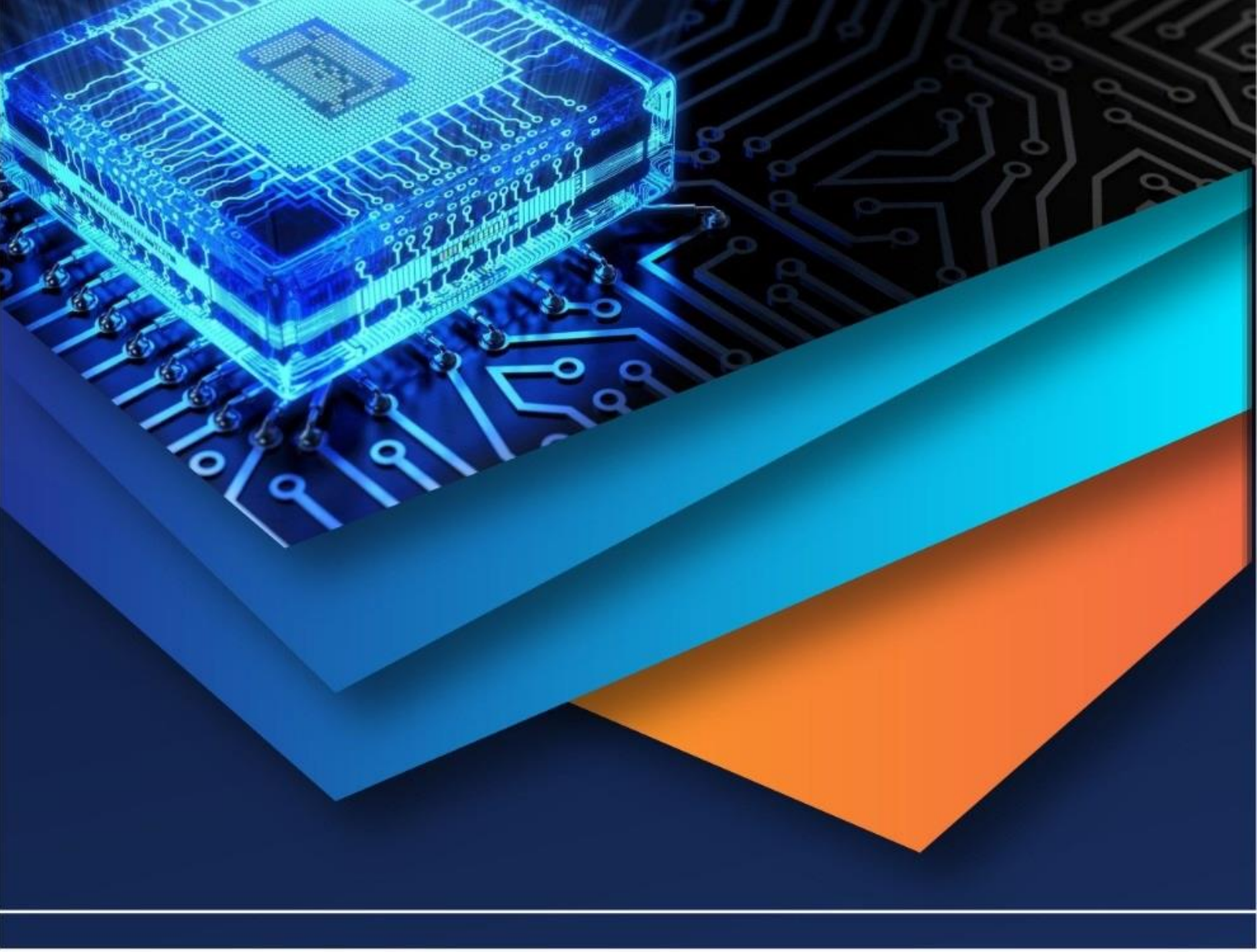

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