FRUITS DETECTION USING DEEP LEARNING

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ABSTRACT

This Paper Presents the recent development in automatic vision based technology. Use of this technology is increasing in agriculture and fruit industry. This helps in speed up the process improve accuracy and efficiency and reduce time. Edge Based and color based detection methods are generally used to segment images of fruits obtained under natural lighting condition. Then image Processing is done to get required feature of fruits such as texture, color, and size. We compared the results of edge based and colored based segmentation results and found that color based segmentation outperforms the edge based segmentation in all aspects. The comparison results are shown in the segmented image results accordingly a new mango method is proposed to position the centroid of mangoes.

Keywords – Image acquisition, pre-processing, segmentation, feature extraction, feature training, feature matching.

INTRODUCTION

1. Deep learning is a method whose architecture is composed of an input architecture is composed of an input layer, hidden layer and an output layer. The quality of fruit detected it is essential part of research in fruit industries. The quality of fruit decides its value. Advanced photography and image processing using image segmentation and clustering in the fruit detection can be helpful in the fruit quality assessment the

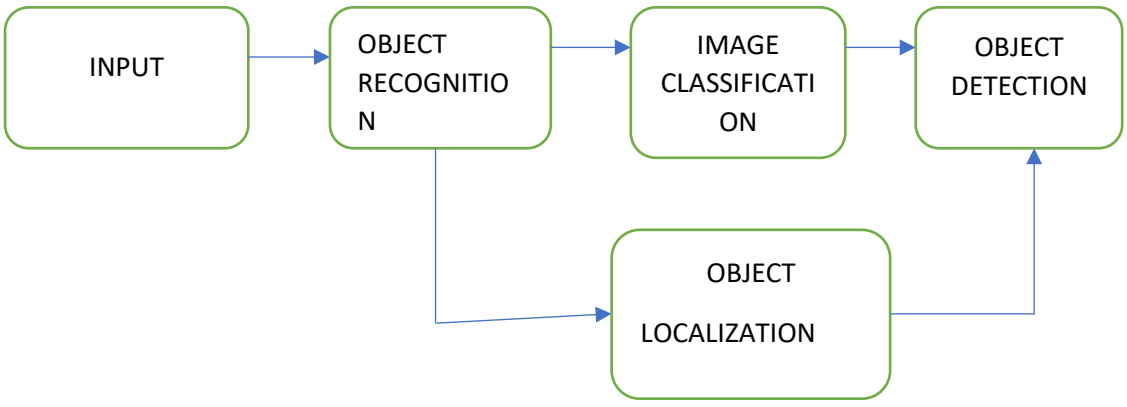
accuracy is increased than the existing K-means clustering algorithm considering the time complexity of the proposed system.

||. RELATED WORK

Although many researchers have tackled the problem of fruit detection. This is due to high variation in the appearances of the fruits in field settings. Including color, shape, size, texture and reflectance properties. Various works presented in the literature address the problem of fruit detection image segmentation. In all of the above mentioned works a pixel-level segmentation approach for object detection has been adapted, and most of these works have examined fruit detection predominatly for field essential. Recently deep neural networks have mode considerable progress in object classification and detection. This marks a great case for the use of multi-model fruit detection systems because varying types of sensors can be provide complementary information regarding different aspects of the fruits.

METHODOLOGY

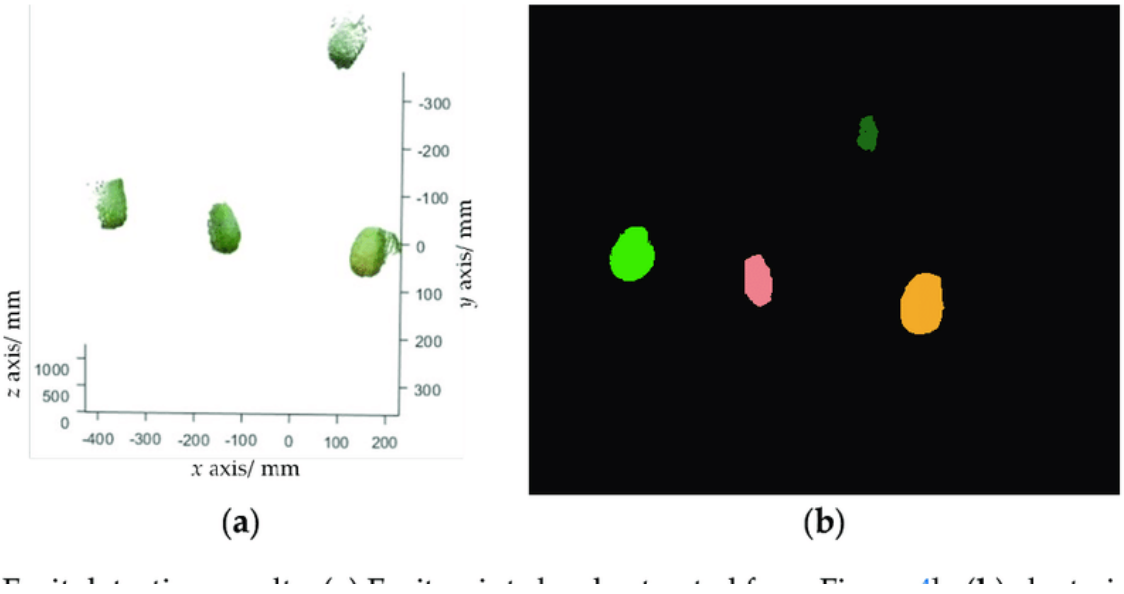
METHODOLOGY WORKFLOW:



Fruit segmentation is an essential step in order to distinguish the fruits from the background. In this section, we present the state of the fruit detection system Which performs pixel-wise segmentation, against which we compare.

A. Fruit Detection Using a Conditional Random Field

In prior work, we demonstrated that using a crf to model color and visual texture feature from Multispectral images led to the impressive performance for sweet paper segmentation. The color features are constructed by directly converting the RGB values to the HSV color space. NIR images are used to calculate texture features, as they were found to be more consistent than the color imagery.

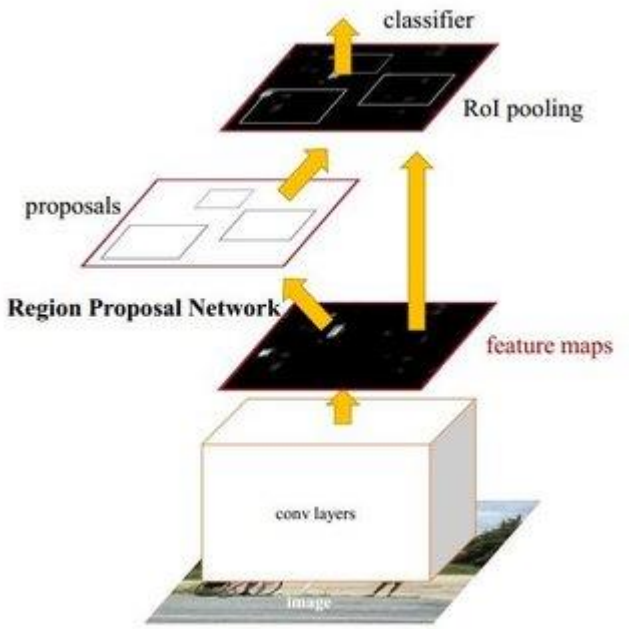


(a) (b)

B. FRUIT DETECTION USING FASTER R-CNN

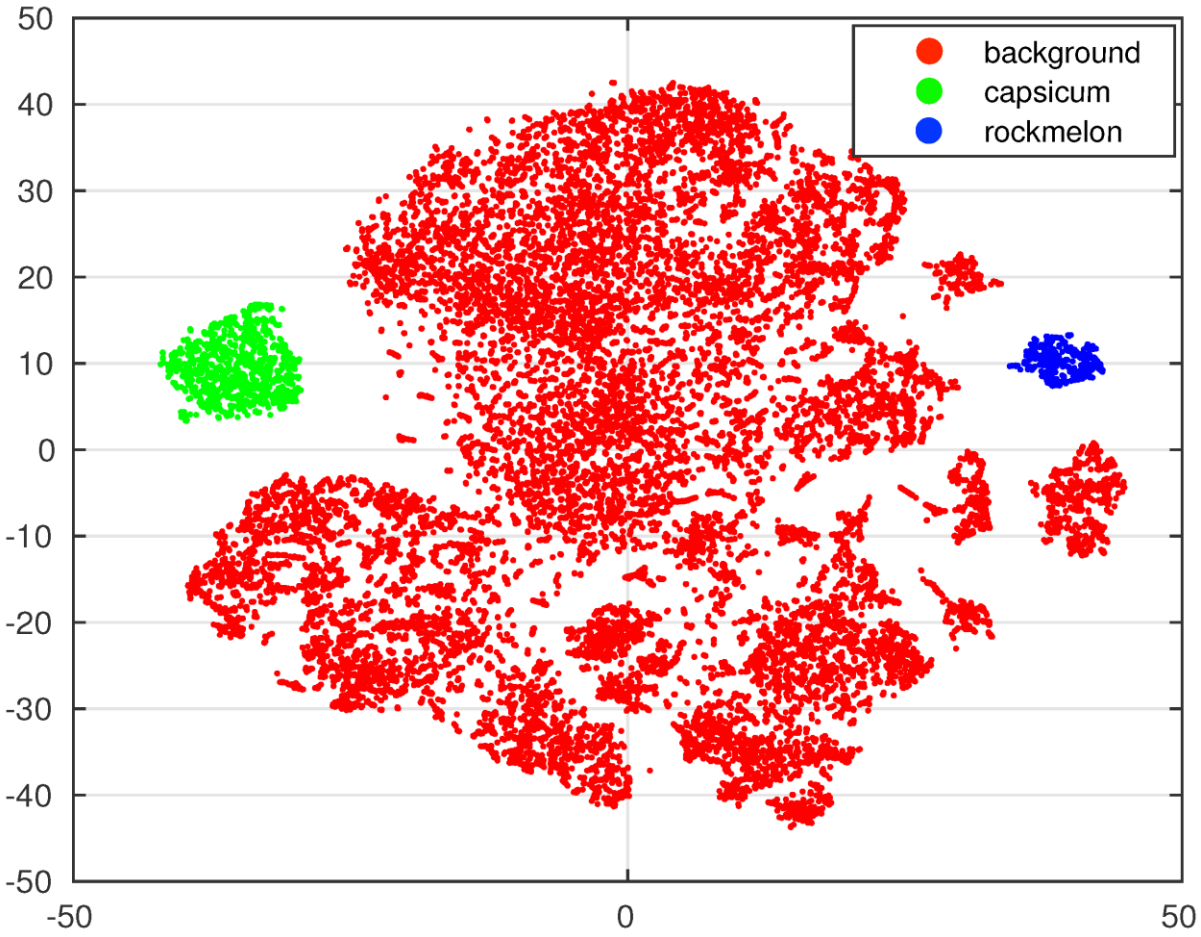
Despite the recent progress being made using deep convolutional neural networks on large-scale image

classification and detection, accurate object detection still remains a challenging problem in the computer vision and machine learning fields. The Faster R-CNN work of uses color images to perform general object detection.



C. DEEP FRUITS TRAINING AND ITS DEPLOYMENT

The data that we have are multi-model, color in nature and so we fine-tune the faster R-CNN for each modality independently. Fine-tuning consists of updating, or adapting, the model parameters using the new data. This implies that we are required to fine-tune again the network using our custom data.



D.MULTI-MODEL FUSION

In the section, we introduced the proposed fruit detection approach using the Faster R-CNN framework.

Here, we present the methods, late and early fusion, that we use combine the multi-model imagery that we have.

PERFORMANCE ANALYSIS

This section present performance evaluation of proposed fruit recognition system considering different image. The

experiment is conducted using Matlab. The traning image used for analysis is shown in fig. 1. The feature extraction process of input image of mango is shown in shown in Fig 2. The final feature extracted is shown in fig 3. In fig 4, the image is classified as mango and output its calorie as 60. No prior work has considered automatic classification fruit with amount of calorie it offers.

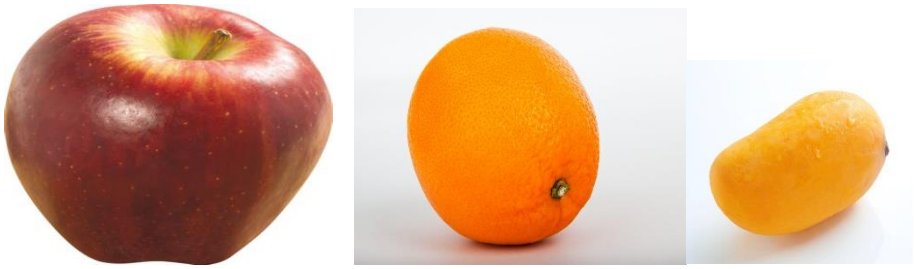


Fig. 1. Training image used for experiment analysis

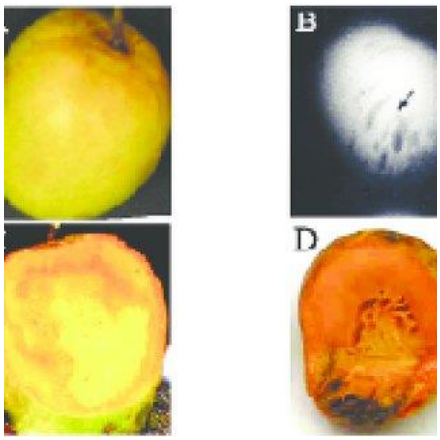


Fig 2, and Fig 3. Image feature extraction of mango

CONCLUSION

- We present approaches for a vision based fruit detection system that can perform up to a field farm dataset, maintaining

fast detection and a low burden for ground truth annotation. This is a competitive result compared to our previous pixel based detector of 0.80. future work involves the integration of the proposed algorithm with our custom-built harvesting robot and the collection of an enormous amount of groung truth annotation for a variety of fruits by utlising amazon mechanical turk or other out-sourcing supplies to achieve more accurate performance. The proposed project is able to recognize the fruit based on the features like shape, color, and texture.This increases the knowledge of common people about some rare and unknown fruits. The project is mainly concentrating on reducing human effort and making human life easier. Fruit recognition will be able to reduce the current ongoing problems. It reduces confusion among the particular fruit.Future work that can be added to this project may be the development of a web app. Here the user can use this application anytime anywhere.

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