

## Recognition and Detection of Fruits Diseases Using Machine Learning Techniques

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**Abstract** —Image Processing is basically processing of images using certain mathematical operation by using any form of signal processing method. The input of image processing can be images, videos, series of image etc. The output of image will be either image of some characteristics related to images. Mostly the image in image processing are treated as two dimensional image but it can also be treated as three dimensional image. In this paper we are trying to identify diseases in fruits using captured images. It will basically reduce the human effort. Efficient and accurate recognition of fruits and vegetables from the images is one of the major challenges for computers. In this paper, we introduce a framework for the fruit and vegetable recognition problem which takes the images of fruits and vegetables as input and returns types of fruits and its diseases as output. It is hard for human to identify the fruit disease just by seeing. For probing we don't need to dichotomise the fruits. In this first we will capture the image of a diseased fruit and we will train the machine that this type of image is diseased fruit. After this if we capture image and show to our machine it will identify the disease of fruit. It will also tell which disease it is having and counter measures to keep a check on such diseases.

**Keywords**- Image Processing; Segmentation; Feature Extraction; Classification; Machine learning; Clustering; Pattern recognition; Texture analysis;

### I. INTRODUCTION

India has a moment rank in the generation of natural product. Agribusiness is a noteworthy division of Indian economy since it contributes 17 percent of the aggregate Gross Domestic Product (GDP) of India and gives the work to more than 60 percent populace. Reliably gigantic measures of natural products are conveyed and procured all through world. To convey extraordinary nature of items it is vital to find diseases in organic products. The conventional philosophy for ailments identification and distinguishing proof of organic product relies on upon the uncovered eye recognition by the masters yet in some making countries, directing authorities are exorbitant and dull as a result of the far away territories of their accessibility. Programmed distinguishing proof of organic product infections is pivotal to thusly recognise the signs of ailments as appropriate on time as they appear in creating normal item. Location of infection is still a testing undertaking in light of normal changeability of skin shading in various sorts of apples. To implement Image Processing Using MATLAB with Algorithms which combines Gray Level Co Occurrence Matrix and Extended KNN in order to create an Effective Colour, Shape and Texture Identification of Fruit Diseases

### II. LITERATURE REVIEW

- Shiv Ram Dubey, Pushkar Dixit, Nishant Singh, Jay Prakash Gupta have following finding, Infected Fruit Part Detection using K-Means Clustering. We have taken apple as a case study and evaluated the proposed approach using defected apples. The experimental results clarify the effectiveness of proposed approach to improve the defect segmentation quality in aspects of precision and computational time.
- Dubey, Jalal, 2012a; Dubey, Jalal, 2013; Dubey, 2013; Dubey et al., 2013), a framework for fruits and vegetables recognition and classification is proposed. They have considered images of 15 different types of fruit and vegetable collected from a supermarket. Their approach first segment the image to extract the region of interest and then calculate image features from that segmented region which is further used in training and classification by a multi-class support vector machine.
- Anderson Rochaa, Daniel C. Hauagge, Jacques Wainer, Siome Goldenstein Automatic fruit and vegetable classification from images. This paper busted the myth of using arbitrary number of classes and properties like recognition, identification, categorising, and sequencing, which makes the problem complex, and it suggested a unified approach to combine the above properties. This approach simplified the processing and

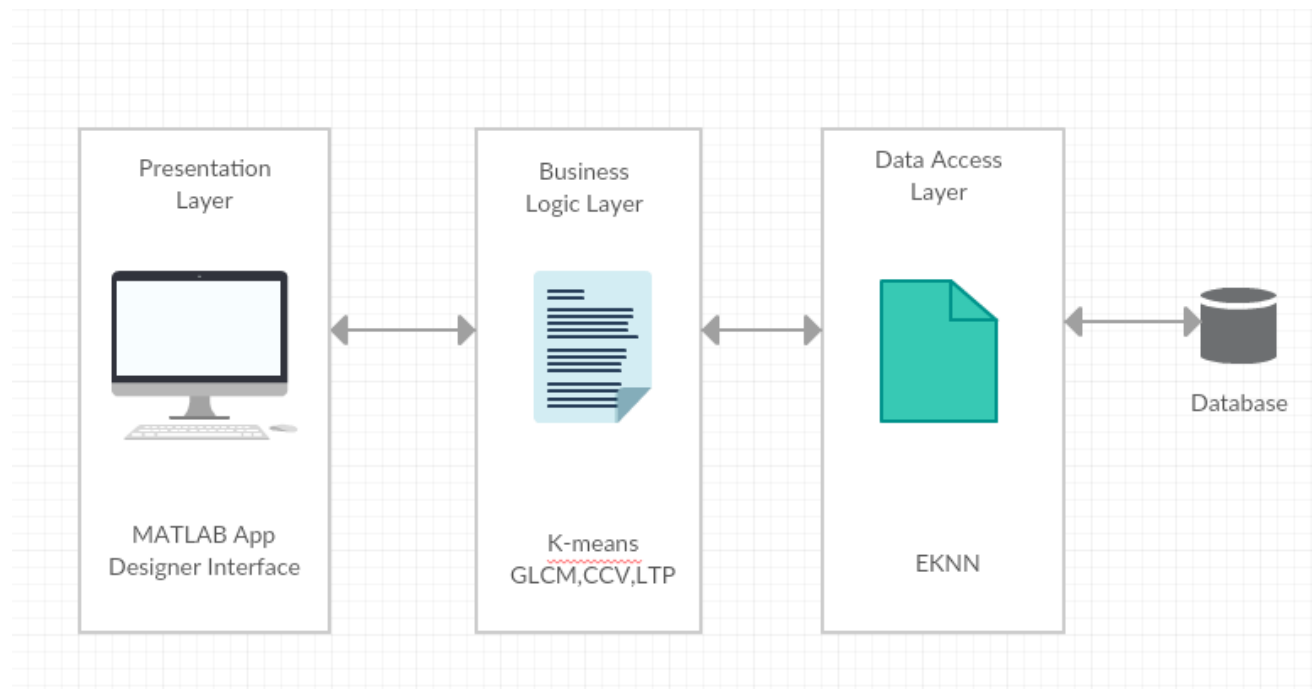
reduced the error and takes less data training.

- Anand Singh Jalal and Shiv Ram Dubey Automatic Fruit Disease Classification Using Images The image processing-based proposed approach is composed of the following main steps: in the first step K-Means clustering technique is used for the defect segmentation, in the second step some color and texture features are extracted from the segmented defective part, and finally diseases are classified into one of the classes by using a multi-class Support Vector Machine.
- Brosnan, T., Sun, D. -W. (2002). Inspection and grading of agricultural and food products by computer vision systems - a review. Computers and Electronics in Agriculture, 36(2-3), 193-213. Industrial revolution resulted in faster production but with manual inspections it created a bottleneck in the assembly line for any industry. With this paper they suggested fast, accurate and quality based determination of fruit products using a non-destructive technique to accomplish this requirements. This technique can also be used for analysis of wheat, cheese, pizza, bread etc. It can also be used for examining grain quality and characteristics. This ensured high quality and safety standards in cost efficient manner.

### III. PROPOSED SYSTEM

We propose a simple, efficient and effective approach for fruits disease classification. Using the learned data for improving for the system. This application can be used : To identify fruits by farmers, grocery buyers etc. Used in agriculture and food industry. We can achieve the following goals. 1. Correctness: Fruits can correctly classified. 2. Availability: Availability of Disease Identification for the masses 3. Reduced Human Effort: It helps in reducing human efforts for disease classification in fruits. 4. Cost Effective: The application is quite cost effective.

### IV. SYSTEM ARCHITECTURE



### V. CONCLUSION

This paper introduces and evaluates an approach to detect fruits diseases using images. The described format operates in following three steps. The steps are segmentation, feature extraction, classification.

Segmentation is done using different K means implementation. We extracted some state-of-art colour, texture and shape features from the image and fused them together. The fusion of colour, shapes and texture information makes the resultant feature more discriminative than colour and texture feature individually.

Feature Extraction is done using GLCM,CCV,LTP and their combinations. Classification is done using Extended KNN. This paper uses an Extended KNN for the training and classification.

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