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MACHINE VISION TECHNIQUE BASED SMART FRUIT GRADING SYSTEM

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Abstract- *There is an increased demand for quality fruit and vegetables to process juice, wine and syrup in today's competitive market. Traditional fruits and vegetables processing and editing of good and new quality is time it consumes and requires highly skilled workers. Computer view and Electronic learning methods are the best solutions to the problem mentioned above. The current paper uses a novel how to divide the distance of pomegranate and mango texture fruits and color features gradient. In this program the photos taken by Raspberry pi V2. Camera image is provided by the system and analyzes fruits. The statistical results show that the proposed method applies to the distance division as well identification of fruit features with different texture and color gradients at an acceptable level.*

Keywords: Raspberry pi, Open CV, Machine Learning, Python

1. INTRODUCTION

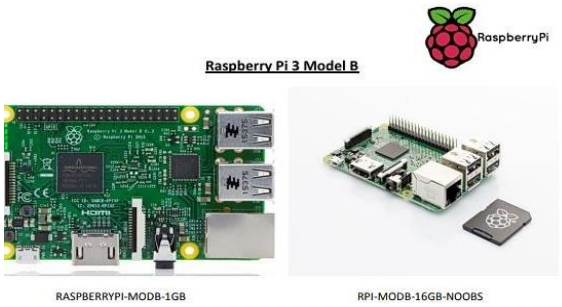
Is a famous fruit, because of its taste and nutritional value. Mango trees are cultivated various interesting regions. Sorting fruit based on process is also tedious it consumes more time, proves to be more expensive and causes inaccuracies. Any acquisition program has a set of rules that work well and therefore the system gets the right quality of fruits based on feature detection regulations. This paper is concerned about to improve the quality of products and products of fruit-based foods as soon as fruit quality is maintained. From the point of view of handicrafts, the process of fruiting depending on its color it turns out that it is not very satisfying which is why the process of building the system. With growing technology and automation, the use of hardware and software turns out to be helpful it is sufficient to improve the placement and quality inspection of the fruit. Project process curtains involved in taking a photo of the fruit under test for its quality here analyze gradation through software management using image processing techniques as well discarding defective fruit. The difficulty of some low-cost systems that work well is overcome by this the normal way. This method incorporates an important way of holding fruit and helps in the file process speed. Critical emphasis involves registering a high quality checking and the quantity of fruit with less time and processing of fruit production is greater scale.

2. METHODOLOGY

In this project, we have collected a number of details of fruit images that are good and bad images. This fruit information Information helps to get more accurate results. RGB image is converted to HSV color space. After that the lower and upper grades are defined. After that the distances of the binary image are explained. Then turn the mask of one channel back to 3 channels. 3. By removing the colored object to get red, here we use the HSV color script to find the lower / upper limits. The HSV color space provides details about the image that is, whether or not it is present in this program. The tomato color image was used for analysis. If the pixel value is below the selected limit value then it is considered to be part of the wrong skin example bad quality fruit. Any pixel value larger than the selected limit value is part of pure skin i.e. good quality fruit. Then calculate the number of white pixels that will be equal to the number of pixels associated with damaged skin

3. HARDWARE COMPONENTS

RASPBERRY PI



The raspberry pi is a series of small single-computer computers developed in united kingdom by the Raspberry pi foundation to promote basic computer science teaching in schools and developing countries within the various Raspberry pi series. This project used the Raspberry pi 3 modal.

Specification:

• Broadcom BCM283764 bit ARMV 7 Quad core processor is powered by a single-board computer operating at 1.2GHZ.

• 1 GB RAM.

• BCM43143 wi-fi mounted.

• Low Bluetooth (BLE) power on board.

• 40 pin extended GPIO.

• 4 * USB 2 ports.

• 4 pole stereo output and integrated video port.

• Full HDMI size.

• CSI camera port for connecting Raspberry pi touch screen display.

• MICRO SD port for loading your operating system and data storage.

• Enhanced Micro USB power source (now supports up to 2.4 AMPS).

• It is expected that the same thing will be similar to pi 3 modal B, but the LEDS will change position.

HDMI VGA cable

HDMI VGA Cable

This flexible VGA cable to HDMI is one way to compose. It only converts from VGA (output analog signal such as pc / Laptop) to HDMI (digital signal input such as monitor, projector).

MEMORY CARD (16GB)

Memory Card

A 16GB memory card can hold approximately 4,400 photos. This is based on the jpg file format, at 12MP. Gopro standard photo editing.

CAMERA (Zebronics web cam)

Zebronics-camera

The Zeb-crystal pro is a USB-enabled web camera that comes with a 3p lens that produces clear videos and photographs.

4. SOTWARE REQUIREMENTS

IMAGE USE IMAGE: OPEN CV

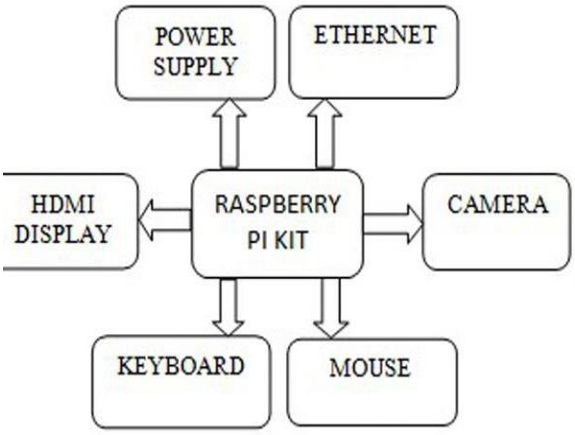
Open CV was originally written in c but currently has a c ++ interface and also has a complete python interface in the library. An open Source computer, associated with a free software package intended or computer viewing is

used in this project due to its flexibility and the fact that it has a c ++ interface. Open CV is very useful for large operating system (OS), which makes it useful when you use another com.

LANGUAGE: PYTHON

Python is a high-performance programming language that is widely used in applications. python, translated language. It supports several program scripts and syntax that allow you to use programs in multiple languages such as c ++ (or) Java. The language provides a structure designed to allow for clear plans on each scale. Python is simple and easy to recognize, python code is way simpler than different languages.

BLOCK DIAGRAM



CONCLUSION

External fruit structures such as color, size, texture, texture and distortion are the most important aspects of fruit classification and fruit classification. Nowadays thanks to improved machine views and the availability of low-quality hardware and software, the handiwork of fruit classification and grading has been replaced by automated machine vision systems. Another reason for non-destructive automation is its ability to produce results that are more accurate, faster, more purposeful and more efficient than manual labor. This paper reviews the basic process of flow of fruit separation by organization. In future, for the great volume of production the number of web cameras and length of conveyor system can be changed to our needs. This paper presents new integrated techniques for sorting and grading of different fruits. Generally image capture is a big challenge as there is a chance of high uncertainty due to the external lighting conditions, so the advantages of gray scale image is taken into account, which are less effected to the external environment changes as well as beneficial for finding the size of a fruit.

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