

Quality Fruits Identification Using Image Processing by Lab View

Sona Antony S, Suganya S, Veena Sree S, Yuvaraj V

Department of ECE, Sri Eshwar College of engineering, Coimbatore, Tamilnadu, India

ABSTRACT

This project is developed for an automation purpose which is suitable for juice making industries. The main objective of this project is to identify the quality of the fruits based on its colour. For this, use image processing for processing the colour. By using image sensor, we monitor the fruits which are moving in a conveyor belt. The monitored information is sent to image processing section. By using Lab VIEW we process the images and as the result we get an extracted colour of the input product. If the fruits are in expected colour, then it process to the next section and if the fruits are not in expected colour, then an alert saying that the corresponding fruits is not suitable for the next process. For this project PIC microcontroller and Lab VIEW has been used.

Keywords: PIC Microcontroller, Image Processing, Lab View And DC Motor.

I. INTRODUCTION

The fruit industry and juice making industries plays a very important role in a country's growth. It is a part of the food processing industry. Fruits are the major source of energy, vitamins, minerals, and other nutrients. These energy must be a part of our diet. Fruits come in varying shapes, color and sizes. In current scenario it is very difficult to detect fruit color whether it is a good or bad because of poor process, but it is now easy to find quality fruit by using image processing technology. The first step in this project is image processing and finally, attaining the required output, which may satisfy the Requirements of the user. At present, many of the fruit quality detecting system have the disadvantage of low efficiency, low speed of grading, high cost and complexity. So it is noteworthy to develop high speed and low cost fruit size detecting system. The quality of the fruits are very significant for the consumer. In addition, the fruit require from suppliers to supply fruit goods with high standards of quality. In market, the quality of the fruit is also very important because the physiological disorder, damage cause delay the growing export market. The quality of the food product includes outer parameters like size, color strength, color homogeneity, shape, appearance

and quantity, inner parameters like sugar contents, acid contents or inner diseases and firmness. The most important factors, which influence, are taste/ flavor, freshness/ripeness, visual appeal and cleanliness.

II. METHODS AND MATERIAL

A. Literature Survey

As we know fruits has good vitamins and it is very essential in our daily life. Fruits, commonly consumed in daily diets, are a major source of anti-oxidants. There are a seasonal fruits and which their availability is limited during certain season[1]. Fruits find enormous uses in both fresh and processed forms. Processed forms include jam, paste and juice. Export of these processed products of fruits yield more income for the country. In order to get good quality of processed products the quality of fruits should be good. Identifying good and bad quality fruits in industries manually is the very tedious process as it consumes large amount of time and the labor cost will be high[2]. It also reports on the accuracy and performance of each method implemented in the papers taken into consideration. Morphological features, color features, intensity based features and other features are extracted

from the fruit images and these are subject to various types[3]. Image processing techniques on digital systems which are used on agriculture can be evaluated for different aims. For instance detection of wild herb, to estimate product, to determine ripness and quality are some of them. The most widely used one is detection of fruits and vegetables. This aims to determine the location of orange and green color fruits to separate them from leaves and branches in that area[4]. Therefore it is very important to identify the quality of fruits by the automatic way for the purpose of its usage necessary in industries. To overcome this problem, image processing method in industries has become a major issue in recent years. Using LAB VIEW software as a tool in image processing, we can find the quality of Fruits. Finally after collecting lot of trained data bases, we have proposed certain range. With these ranges we can identify the quality of Fruits, whether it is good or bad. And in this project we use the lab view software which friendly and efficient for the result.

PIC MICROCONTROLLER

PIC is a family of Harvard architecture microcontrollers made by Microchip technology, derived from the PIC1640. Originally developed by General Instruments Microelectronics Division. The name PIC initially referred to "Programmable Interface Controller". PICs are popular with both industrial developers and hobbyists alike due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, and serial programming (and re-programming with flash memory) capability.

Core Architecture

The PIC architecture is characterized by the following features:

- Separate code and data spaces (Harvard architecture) for devices other than PIC32, which has a Von Neumann architecture.
- A small number of fixed length instructions
- Most instructions are single cycle execution (2 clock cycles), with one delay cycle on branches and skips
- One accumulator(W0), the use of which (as source operand) is implied (i.e. is not encoded in the opcode)

- All RAM locations function as registers as both source and/or destination of math and other functions.
- A hardware stack for storing return addresses
- A fairly small amount of addressable data space (typically 256 bytes), extended through banking
- Data space mapped CPU, port, and peripheral registers
- The program counter is also mapped into the data space and writable (this is used to implement indirect jumps).
- There is no distinction between memory space and register space because the RAM serves the job of both memory and registers, and the RAM is usually just referred to as the register file or simply as the register.

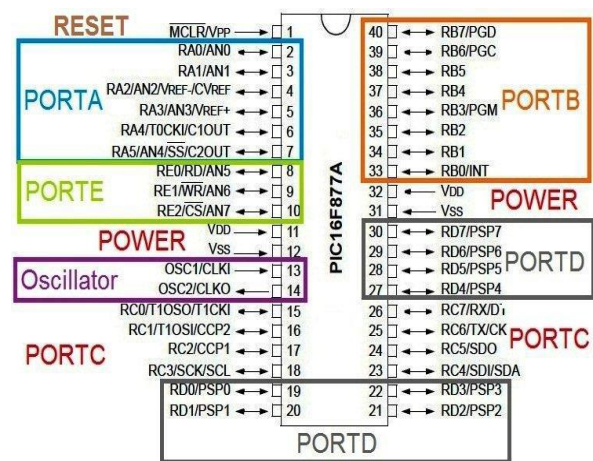


Figure 1. Pin Configuration of PIC 16F877A

Image Processing

In imaging science technology, image processing is the processing of images using any form of signal processing for which the input is an image that is the fruit image, a series of images, or a video, such as a picture or video frame; the input of the image will be processed and the output of image processing may be either an picture representation or a set of characteristics or parameters related to the image. Most of the image-processing methods involve treating the image as a 2-D signal and applying normal signal-processing techniques to it. Images are also processed as 3-D signals with the third-dimension being time. Image processing usually refers to digital image processing, but optical and analog image processing also are possible. The acquisition of images that is producing the input image in the first place is referred to as imaging. when related to image processing are

computer graphics and computer vision. In computer graphics, images are manually made from physical models of objects, environments, and lighting, instead of being acquired (via imaging devices such as cameras) from natural scenes. On the other hand, Computer vision is often considered as the high level image processing out of which a machine/computer/software intends to translate the physical image or a sequence of images. But this image processing is suitable for a particular environment condition, since the correct output may not occur due to such problems.

LAB View

Laboratory Virtual Instrument Engineering Workbench (Lab VIEW) is a system-design platform and development environment for a visual.

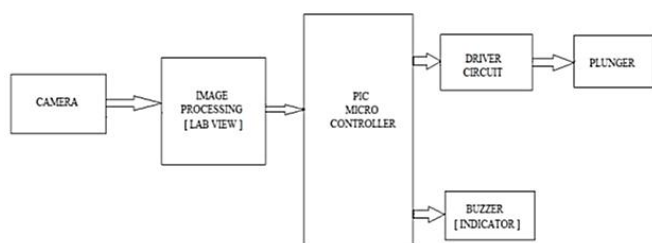


Figure 2. Block Diagram

III. RESULTS AND DISCUSSION

Description of Block Diagram

Programming language from National Instruments. The graphical language is named "G"; not to be confused with G-code. Originally released for the Apple Macintosh in 1986, Lab VIEW is commonly used for data acquisition, instrument control, and industrial automation on a variety of operating systems (OSs), including Microsoft Windows, various versions of Unix, Linux, and macOS. The latest version of Lab VIEW is 2016, released in August 2016.

DC Motor

DC motors are part of the electric motors using DC power as energy source. These devices transform electrical energy into mechanical energy. The basic principle of DC motors is same as electric motors in general, the magnetic interaction between the rotor and the stator that will generate spin.

Block Diagram

In order to sort the good quality of fruits, the fruits are made to pass through the conveyor and capturing its image by using a Web Camera. The obtained image is processed by program which is fed into the Lab VIEW software. Thus the fruits are sorted out and differentiated by using the color. The captured image is analyzed for the histogram data. Based on the given in the vision and mission data, the image is processed by the program done in LabVIEW software. If the fruit is in the desired color the program which is in the PIC microcontroller will allow the mango to pass through the conveyor and fall on the chamber A which is kept at the end of conveyor, else a signal will be passed and it will eject the defected fruits to chamber B which is present the side of the conveyor.

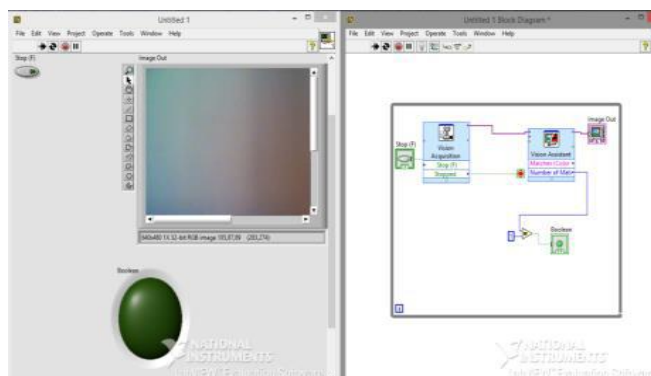
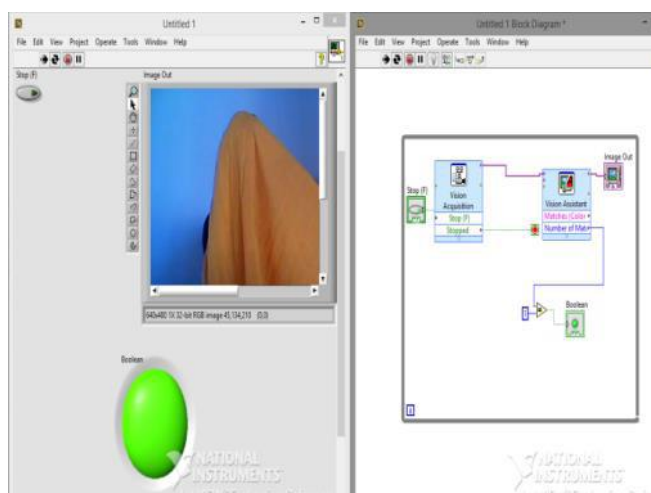


Figure 3. Sample Output in LABVIEW



IV. CONCLUSION

In this paper the quality identification of fruits whether it is good or bad is mainly based on quality in image processing using LAB VIEW is successfully done. The

use of image processing for identifying the good quality of fruit can be applied not only to any particular fruit but also can be applicable to identify the vegetables. Thus, this will enable the technology to be applied in many products to reduce the manpower and to make the process automatic.

V. REFERENCES

- [1]. IJRET : International Journal Of Research in Engineering and Technology "The Quality Identification of Fruits in Image Processing using MATLAB".
- [2]. IJIREICE-International Journal of Innovative Research in electrical, Instrumentation and control Engineering, vol 4, Issue 1, January 2016 "A fruit Detecting and Grading system Based on Image Processing-Review".
- [3]. International Journal of Advanced Research in Computer and Communication Engineering. Vol. 4, Issue 12, December 2015. "Fruit Identification and Classification Techniques, a review Using Neural Networks Approach".
- [4]. "Detection of orange and green colour fruits in outdoor conditions for Robotic Applications" vol 3, issue 10,june 2014.