ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 3, March 2019

Fruit Quality Analysis by Image Processing

S.Ayyappan[1] , M.Sathish Kumar[2], J.Stepan Raj[3], P.Devaraj[4]

Assistant Professor, Department of Electrical and Electronics Engineering, Jai Shriram Engineering College, Tiruppur, Tamilnadu, India [1]

UG Scholar, Department of Electrical and Electronics Engineering, Jai Shriram Engineering College, Tiruppur, Tamilnadu, India [2,3,4]

ABSTRACT: Recent technological advances have paved the way for developing and offering advanced services for the stakeholders in the agricultural sector. A paradigm shift is underway from proprietary and monolithic tools to internet-based, open systems that will enable more effective collaboration between stakeholders. This new paradigm includes the technological support of application developers to create specialized services that will seamlessly interoperate, thus creating a sophisticated and customisable working environment for the end users. We present the implementation of an open architecture that instantiates such an approach, based on a set of domain independent software tools called **''**genericenablers**''** that have been developed in the context of the FI-WARE project. The implementation is used to validate a number of innovative concepts for the agricultural sector such as the notion of a services' marketplace and the system's adaptation to network failures. The results of the evaluation process validate the acceptance of such a system and the need of farmers to have access to sophisticated services at affordable prices. A summary of this evaluation process is also presented in this project.

KEYWORDS: Generic enablers, Internet –based.

I.INTRODUCTION

In order to improving fruits' quality and production efficiency, reduce labor intensity, it is necessary to research nondestructive detection technology. Fruit nondestructive detection is the process of detecting fruits' inside and outside quality without any damage, using some detecting technology to make evaluation according some standard rules. Nowadays, the quality of fruit shape, default, color and size and so on cannot evaluate on line by the traditional methods. With the development of image processing technology and computer software and hardware, it becomes more attractive to detect fruits' quality by using vision detecting technology. At present, most existing fruit quality detecting and grading system have the disadvantage of low efficiency, low speed of grading, high cost and complexity.

In first case we are going to sort circular shaped fruits according color and grading is done according to size. It is designed to combine three processes such as feature extraction, sorting according to color and grading according to size. Software development is highly important in this color classification system and for finding size of a fruit. The entire system is designed over MATLAB software to inspect the color and size of the fruit. Here grading can be categories into four ways Red small, Red big, Green small, Green big.

ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 3, March 2019

II.BLOCK DIAGRAM

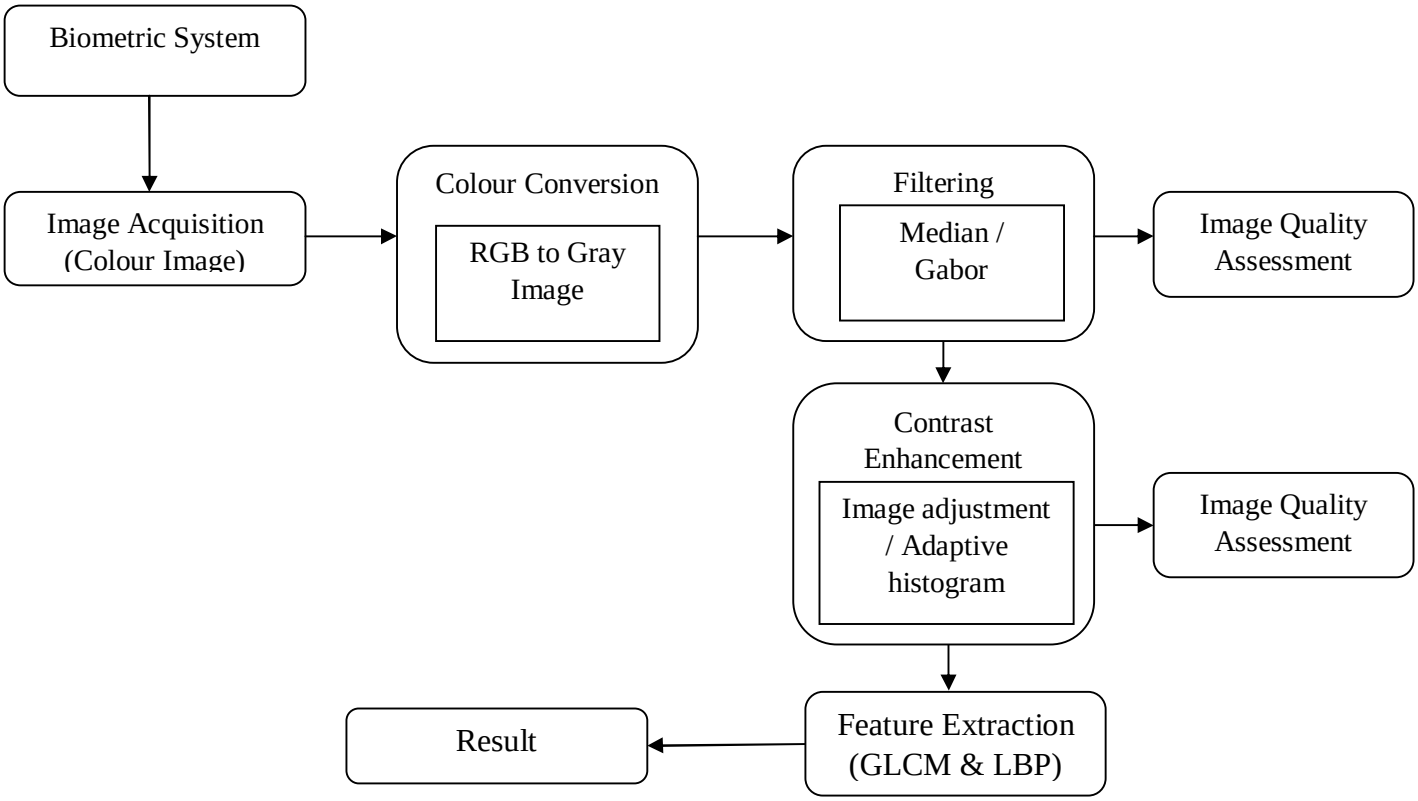
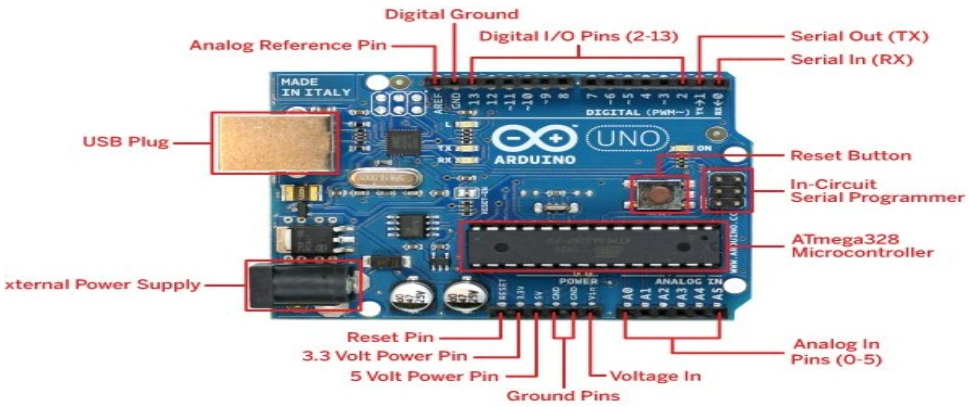


Figure 2.1 Block Diagram

Input from biometric and acquitted image (colour image). After getting input colour conversion takes place, in this process RGB (Red Green & Blue) is converted into Gray image. After colour conversion filtering image will be carried out using Median/Gabor Binary pattern (MGBA).The filtered image send for the contrast enhancement in that enhancement there will be a two process there are image adjustment/adaptive histogram then the image is set for the future extraction (GLCM & LBP). The resultant image is obtained.

III.ARDUINO



ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 3, March 2019

ARDUINO is actually a microcontroller based kit which can be either used directly by purchasing from the vendor or can be made at home using the components, owing to its open source hardware feature. It is basically used in communications and in controlling or operating many devices. The ARDUINO Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

IV.ESP2866

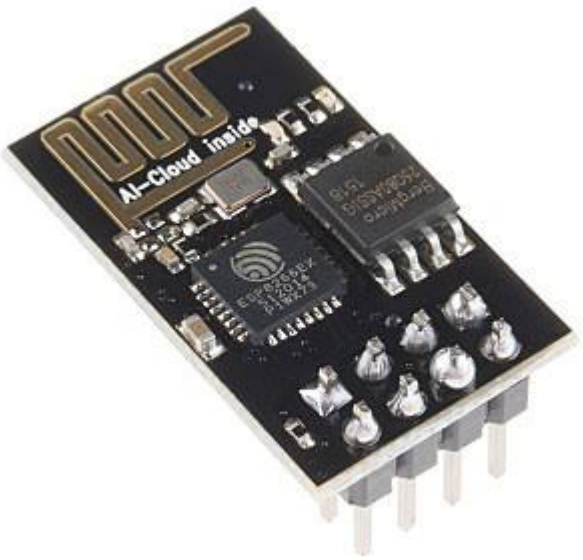


Figure 4.1 Wi-Fi module

The ESP8266 is a low cost Wi-Fi microchip with full TCP/IP Stack and microcontroller. It is a 32 bit microcontroller and it has 16 GPIO input pins. The successor to these microcontroller chips is the ESP32.

V.LCD

Figure 5.1 LCD Display

ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 3, March 2019

LCDis a flat panel display or other electrically modulated optical device that uses the light modulating properties of liquid crystals. If the green light emits in a LED1 the output of fruit is in good condition will be display in the LCD panel. Similarly,LED2 glows in yellow which means fruit is average will be displayed in LCD. When LED3 glows in red fruit is damaged.

VI. CONCLUSION

The proposed system is a demo version, so for a large scale production the number of cameras and length of conveyor system can be modified. This work presents new integrated techniques for sorting and grading of different food and fruits. Generally image capture is a big challenge as there is a chance of high uncertainty due to the external lighting conditions, so we are taking the advantage of gray scale image which are less effected to the external environment changes as well as beneficial for finding size of a food and fruit. Same way while collecting fruit from conveyor system by a main plate there is variation in the weight measurement of a food and fruit so further design can be modified so fruits can be collected stably. Speed and efficiency of a system can be further improved by using ARM9 or ARM11 processor for the same purpose.In future, we can work on image classification for local fruits and vegetables. We can also prepare algorithms and machines for fruits and vegetable grading. A system can be develop which will identify plant/leaf/flower and provide information regarding it. We can also work on some more features for grading and classification, which can identify types of disease and/or texture structure of fruits.

REFERENCES

[1].Agriculture in India: Information About Indian Agriculture & Its Importance. [online] https://www.ibef.org/industry/agriculture-india.aspx. Date: 18.06.2017.
[2] Gomes et al., “Applications of computer vision techniques in the agriculture and food industry: a review”, Eur. Food Res. Technol., 235 (6), 989–1000. 2012.
[3] Zhang et al., "Application of computer vision technology in agricultural field", Applied Mechanics and Materials, vol. 462. Trans Tech Publ, pp. 72–76, 2014.
[4] Vibhute et al., "Applications of image processing in agriculture: a survey", Int. J. Comput. Appl., 52 (2), 34– 40, 2012.
[5] Diego Sebastián Pérez et al., “Image classification for detection of winter grapevine buds in natural conditions using scale-invariant features transform, bag of features and support vector machines”, Computers and Electronics in Agriculture 135, 81–95, January 2017.
[6] A. Vyas et al, “Colour Feature Extraction Techniques of Fruits: A Survey”, International Journal of Computer Applications (0975 – 8887) Volume 83 – No 15, December 2013.
[7] S. Naik et al, “Shape, size and maturity features extraction with fuzzy classifier for non-destructive mango (Mangifera Indica L., cv. Kesar) grading”, TIAR(978-1-4799-7758-1), 5-11, July 2015.
[8] Rashmi Pandey et al.,” Image Processing and Machine Learning for Automated Fruit Grading System: A Technical Review”, International Journal of Computer Applications (0975 – 8887) Volume 81 – No 16, November 2013.
[9] Sapan Naik and Bankim Patel, “Usage of Image Processing and Machine Learning Techniques in Agriculture - Fruit Sorting”, CSI Communications, ISSN
[10] Yudong Zhang et al.,” Fruit classification by biogeography-based optimization and feedforward neural network”, Expert Systems, Volume 33, Issue 3, Pages 239–253, June 2016.