

SUGARCANE BILLET CLASSIFIER

Miss.ASMITA A. MANE Miss.NILKANTI S. DALVI
Miss.ASHWINI B.VADGAVE Mr.NIKHIL J.GAWALI

Guided by: Prof. **Prof. Mr. N.B. KAPASE**
Dept. Electronics Engineering
D.K.T.E Society's Textile & Engineering Institute

1.ABSTRACT

One of the widely taken crops is sugarcane. Sugarcane is very important raw material for the production of Sugar, ethanol, and biogases. In most of countries harvesting machines are used. Recently plantation of Sugarcane is done by using billets. But it has disadvantage also because when forming billets by Harvesting machine it gets damaged and causes billet quality degradation and spreading of diseases.

Here we developed a prototype model to classify the good and damaged billets separately. This model runs on Python program which segregate healthy (good) and damaged billets with the help of Image processing technique after taking pictures of these billets using USB camera. So, the good billets goes for next planting method and remaining billets i.e.damaged billets used for sugar recovery and other by product.

Keywords :Billets , Computer vision for automation, Microcontroller ,Image Processing.

2.INTRODUCTION

Sugarcane is an important cash crop grown commercially for raw sugar, bagasse, and ethanol production around the world. The level of mechanization in production around the world is majorly variable. Especially in the developing world, sugarcane cultivation is dependent on highly manual labor.

New sugarcane growth propagates from a bud, referred to as an eye, located at rings along the length of the cane. Growers have options for seed cane either they use whole sugarcane stalks, which are harvested manually or mechanically by cutting the cane or the second option is to use large chopper harvesters that blades cut each stalk into shorter segments called billets. Compared to whole stalk planting, with billet planting their damage to the seed cane. This billet damage is problematic because cuts, cracks, etc. which creates disease. In sugarcane fields, weeds reduce the germination and crop growth at the initial stage which results in about 27% to 35% of yield loss.



Fig:11-Sugarcane crop field

Now a day's sugarcane is planted in mechanized methods using billets, which are shorter segments of cane harvested and cut by a harvester. The mechanized harvesting process can damage billets, which produces disease, and overall reduction of billet quality. Compared to whole stalk planting with manual methods, qualitative observations suggest that growers approximately

double the planting density when using billets, compared to whole stalks. This paper presents the analysis of sugarcane billet quality using Computer vision.

Our goal is increase the efficiency of mechanical sugarcane planting using robotics –

1) From the planting pipeline identify and remove damaged billets for sugar recovery at the mill.

2) The remaining high-quality seed billets deliver to the soil.

The purpose of this segregation procedure was to create different classes of cane damage with distinct visual features and to then correlates types of damage with new growth after planting.

3.SYSTEM BLOCK DIAGRAM

This chapter explains the full block diagram of the project and also blocks diagram of the subsystems, hardware components and working and brief explanation of each component.

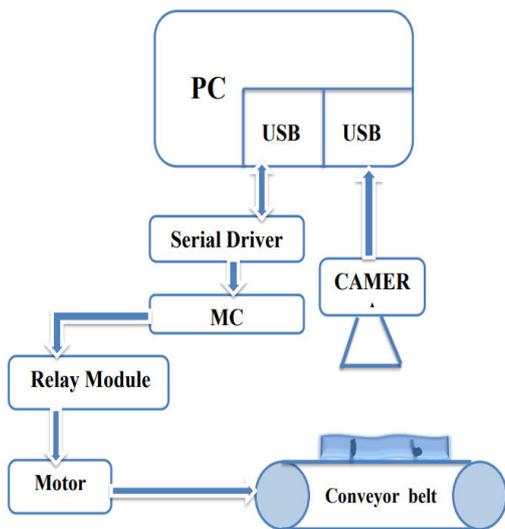


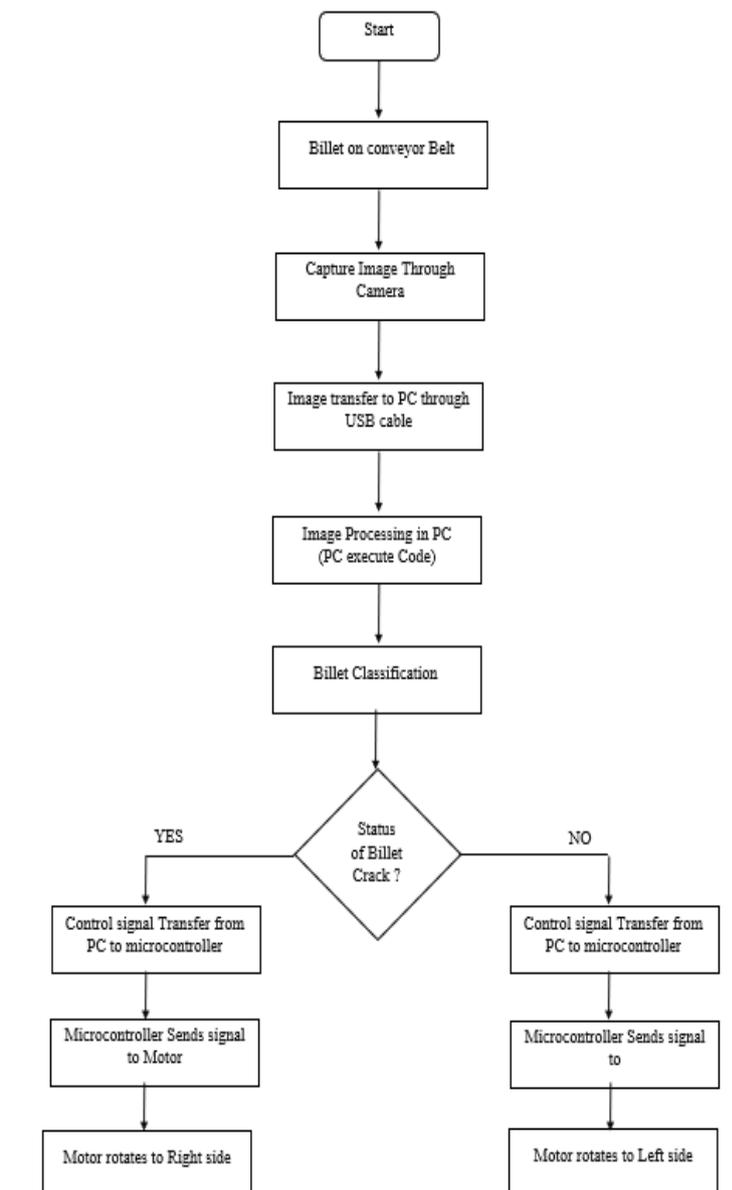
Fig3:Block Diagram of system

Description of Block Diagram:

USB camera capture the image and Image which are stored on it sends to the CPU/PC through USB cable, there feature extraction of billets done by software (OpenCV). After that Software process on image accordingly depends on result CPU send signal to the Microcontroller through

USB & then to relay driver. Microcontroller which used for control sliding motion of conveyor belt So, in image processing method all decision making is done between the CPU and Microcontroller.

4.FLOW CHART



5.RESULTS AND DISCUSSION

Test 1



Fig:5.1.1(test image)-a. Captured image



Fig:5.1.2(test image)-b.HSV image



Fig:5.1.3(test image)-c.Final masking image

Test 2



Fig:5.2.1(test image)-a. Captured image

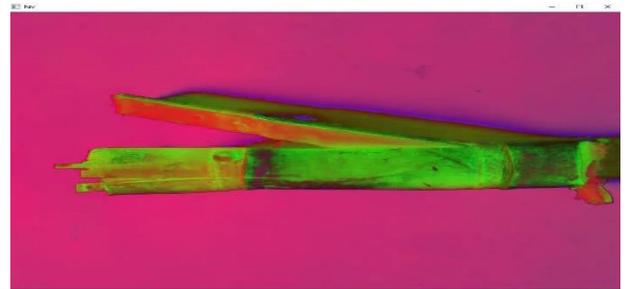


Fig:5.2.2(test image)-b.HSV image



Fig:5.2.3(test image)-c. Final masking image

Discussion:

The RGB shading model is known by an added substance shading model. In RGB color model, to produce broad array of colors red, green, blue light are mixed together. The model name formed from initials of these three colors i.e. red, green, blue. Pictures taken are stored in electronic devices are in RGB color model on the basis of human perception of colors. We process that pictures in RGB to HSV model.

The shortened forms of HSV model is Hue, Saturation, Value. The HSV model is one type of color Palette. In HSV model different colors are mix together. Hue represents various colors i.e. it varies from red, yellow, green, blue and magenta and again it comes back to red. Saturation represents color shades means it shows white components in colors. This implies colors change from unsaturated to fully saturate without any white component. Value indicates brightness of different colors.

Now we apply masking procedure with the help of band pass filter. The values between HSV [62,182,235] and HSV [-18,102,155] are considered as white paints. Total count of white paints is taken. Applying the condition that, if count of white paint is greater than or equal to 2500 (≥ 2500) then “Damaged” label will shown.

If count of white paint is less than 2500 (<2500) then “Good” label will shown.

6.CONCLUSION

Time required for testing is minimum. Increases the efficiency of sugarcaneplanting. Segregation of healthy and damaged billets effectively. Important key features of sugarcane like rings, buds or any damage(crack) on sugarcane billets are recognized with the help of image processing technique. Image processing technique is very effective and non-intrusive tool which is applied to analyze agricultural parameters accurately.

In this paper sample cane billets were categorized according to type of harvester-induced damage.Our work is to remove damaged billets by computer vision and increase the efficiency of sugarcane yield.

7.FUTURE SCOPE

The setup can be modified for testing more billets at a time which will reduce the overall testing time. Another opportunity is that, after few years, image processing will become domain in agricultural field. In weed detection, fruit/food grading system segmentation and classification can also b achieved by Image processing techniques. Because of image processing farmers can use exact herbicides as pe their field so it will become helpful to save the environment and also cost.

8.MODEL



9.REFRENCE

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