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Automated Sugarcane Buds Cutting Method via Image Processing

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ABSTRACT: The majority of the people in the India use Liquefied Petroleum Gas (LPG) as a fuel for cooking, but in India the technology applied in the field (security) is very less. LPG is a flammable gas, which has the potential to create a Hazard, therefore it is important that the properties and safe handling of LPG are understand and applied in the domestic/industrial situations. If cap is absent then leakage problem is created. Most of accidents formed because of defected cap. We overcome this problem by using image processing technique.Sugarcane planting with traditional methods is costly, time-consuming and necessary compression of buds in the field is not achieved easily because of stalk planting in sugarcane. In tradition planting method, great human force and high volume of sugarcane stalk in hectare is required. To solve this problem and mechanizing of sugarcane planting, we suggest the application of machine vision system and image processing methods to identify nodes from sugarcane and to plant it.

KEYWORDS:IMAGE PROCESSING, IMAGE RECOGNITION, CUTTING MECHANISM.

I. INTRODUCTION

Agriculture is one of the most significant sectors of the Indian Economy. Agriculture is the only means of living for almost two thirds of the workers in India. India is world's second largest producer of sugarcane. Sugarcane is the most remunerative crop and has a very high economic biomass to total biomass ratio in Indian economy.

In different types of planting methods, Spaced Trans-Planting with single eye bud, is most widely used planting method for sugarcane. To increase the average sugarcane yield per hectare with minimum cost it is necessary to adapt advanced technologies. Recent advances in Precision Farming using image processing tool have resulted in significant improvement in the areas of agriculture by increasing crop production, with good quality and low operating cost. Digital Image Processing deals with manipulation and analysis of images by using computer algorithm, so as to improve pictorial information for better understanding and analysis.

Now a day's sugarcane planting machines are used to reduce the human force and time. However, these machines do not have control on cutting location. Sometimes, cut may appear on the bud as well, which results into no germinate on of the bud and we lose the seed. To overcome these problems image processing algorithm is developed and implemented for identification of node location on sugarcane stalk. In today's world, Sugarcane automation has got importance in agricultural field so we proposed automatic sugarcane node cutting .

II. WORKING

Problem statement of methodology:

Instead of traditional method we can use automatic buds cutting machine. The traditional sugarcane planting machines do not have any such facility. This project deals with solutions to overcome these problems and talks about use of image processing method for node identification.

Objective:

- To identify the sugarcane node by using image processing method.

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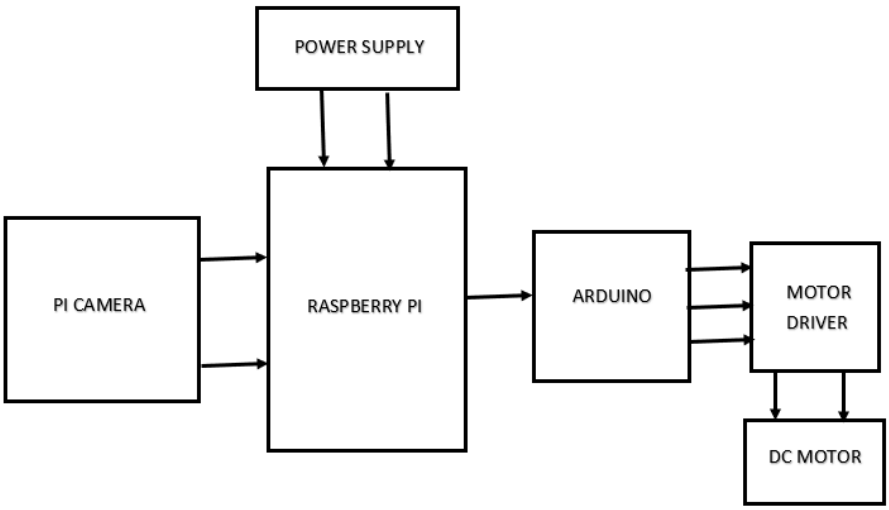
- To reduce human efforts required for sugarcane planting by developing automated sugarcane node cutting machine.
- To develop machine which have proper control on cutting location, so cut can not appear on node and cut maximum nodes at minimum time.

Working:

The research work for this domain was studied and new methods were developed to achieve desired goal. Which will reduce wastage an increase productivity as it will reduce strain on hands of workers and more on safety on operator.

- Sugarcane which placed on conveyor is moved over conveyor by rotating the conveyor system.
- The sugarcane is sensed by camera which is attached at the end of conveyor.
- Camera captures its image and this image is transferred to PC. In PC image is read and converted it into pixel.
- Using image processing code total number of pixels on the edge of image is counted and the same is initimated to raspberry pi and microcontroller.
- The microcontroller give a signal to cutter. Then cutter mechanism is activated.
- The blade will cut the sugarcane in predetermined length.



III.SYSTEM SPECIFICATIONS

In above figure show that basic block diagram of the Iot based UV rays classroom sanitization device, mainly five components are used. By which this device works.

PI CAMERA:

- Fully Compatible with Both the Model A and Model B Raspberry Pi.
- 5MP Omnivision 5647 Camera Module.
- Still Picture Resolution: 2592 x 1944.
- Video: Supports 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90 Recording.
- 15-pin MIPI Camera Serial Interface - Plugs Directly into the Raspberry Pi Board.
- Size: 20 x 25 x 9mm.
- Weight 3g.
- Fully Compatible with many Raspberry Pi cases.

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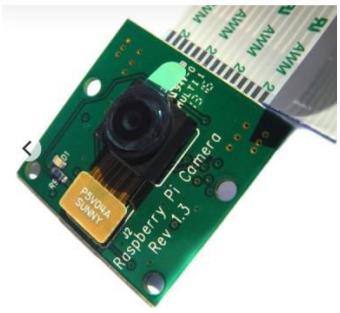

RASPBERRY PI:

- CPU: Quad-core 64-bit ARM Cortex A53 clocked at 1.2 GHz
- GPU: 400MHz VideoCore IV multimedia
- Memory: 1GB LPDDR2-900 SDRAM (i.e. 900MHz)
- USB ports: 4
- Video outputs: HDMI, composite video (PAL and NTSC) via 3.5 mm jack
- Network: 10/100Mbps Ethernet and 802.11n Wireless LAN
- Peripherals: 17 GPIO plus specific functions, and HAT ID bus
- Bluetooth: 4.1
- Power source: 5 V via MicroUSB or GPIO header
- Size: 85.60mm × 56.5mm
- Weight: 45g (1.6 oz)

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DC MOTOR :

- RPM: 300.
- Operating Voltage: 12V DC
- Gearbox: Attached Plastic (spur)Gearbox
- Shaft diameter: 6mm with internal hole
- Torque: 2 kg-cm
- No-load current = 60 mA(Max)

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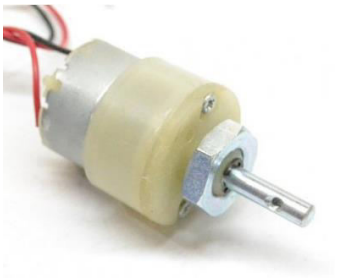
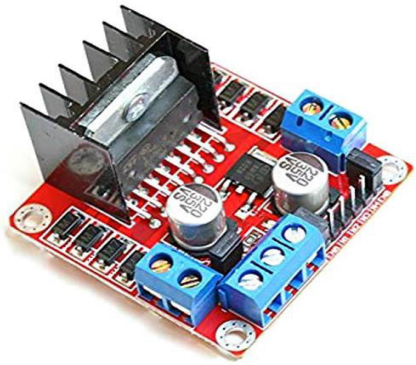
- Load current = 300 mA(Max).



MOTOR DRIVER :

- Driver Model: L298N 2A
- Driver Chip: Double H Bridge L298N
- Motor Supply Voltage (Maximum): 46V
- Motor Supply Current (Maximum): 2A
- Logic Voltage: 5V
- Driver Voltage: 5-35V
- Driver Current:2A
- Logical Current:0-36mA
- Maximum Power (W): 25W
- Current Sense for each motor
- Heatsink for better performance
- Power-On LED indicator



IV. RESULT AND DISCUSSION

Fig shows the working prototype model

Fig. Prototype Model

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V. CONCLUSION

The automated sugarcane node cutting machine is simulated as per proposed diagram. The conveyor and cutter mechanism simulation of project work effectively with the help of image processing the automated sugarcane identification and cutting machine cut the automatically so the newly developed machine will be more effective for sugarcane plating

VI.FUTURE SCOPE

The system can fully Automatic and also utilize maximum of the technology and to do everything smartly and efficiently in order to reduce both energy and time consumption. It has vast scope in various industries because it saves time & Manpower. This machine cut the node automatically so the newly developed machine is more effective for sugarcane node cutting in future.

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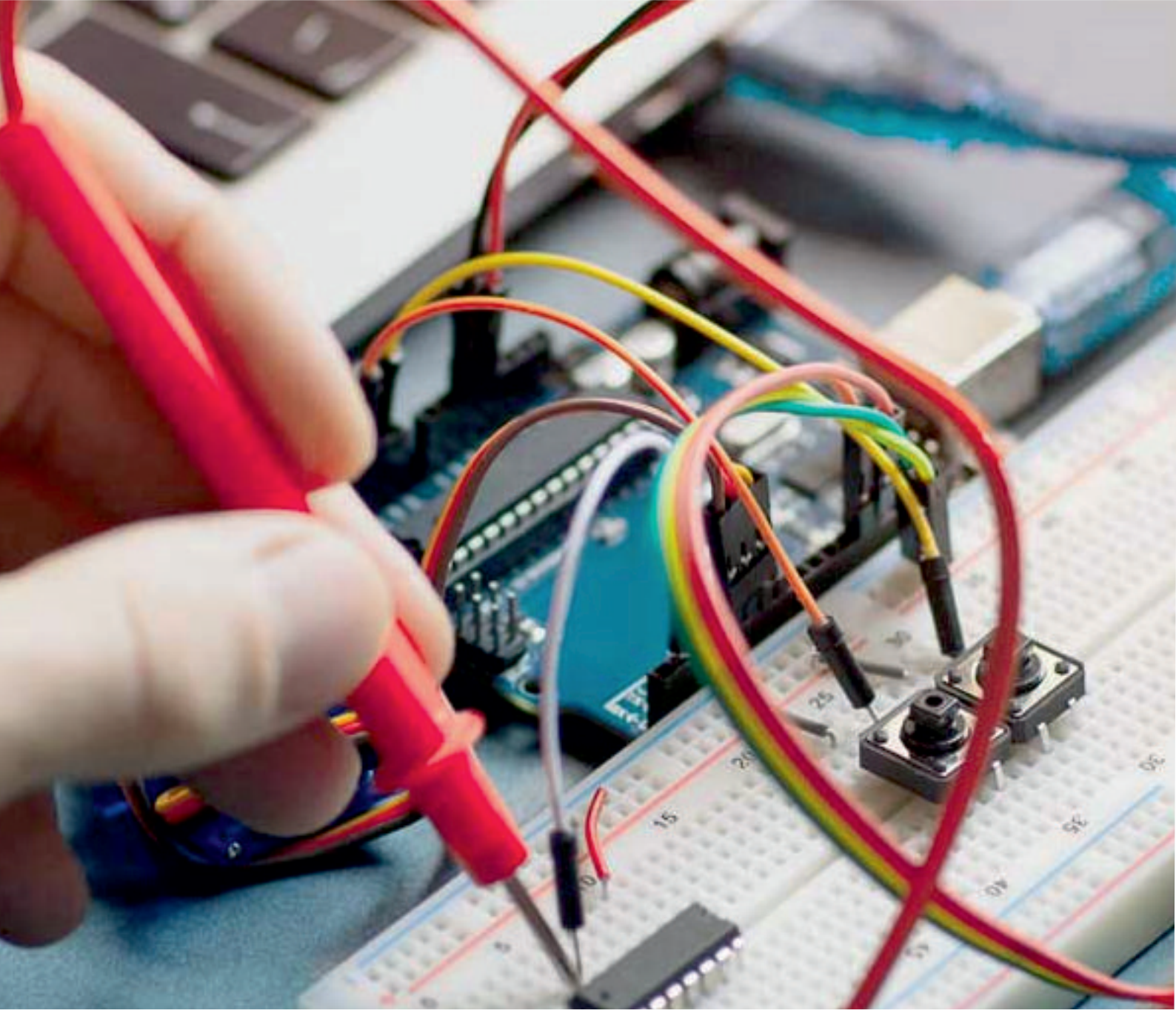

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