

Rose Harvesting Robot

Nithin H V¹, Arpitha L², Chaithra K C³, Deepa Hondad⁴, Bharath kumar H S⁵

¹Assistant Professor, Dept of Electronics & Communication Engineering

^{2, 3, 4, 5}Dept of Electronics & Communication Engineering

^{1, 2, 3, 4, 5}PES Institute of Technology and Management Shivamogga-577204

Abstract- This project investigates the accuracy and effectiveness of harvesting the rose flower using Open CV through C++ and Raspberry Pi. In order to avoid the difficulties of handling the flowers that arise during rose harvest and also to reduce the monetary cost of the entire system, a rose flower harvesting system using Raspberry Pi is introduced. It is used to create an environment which will automatically detect and identify the rose flower in the flower garden using the image processing algorithms running on Open CV. We use the Raspberry pi module which is an Embedded So C architecture (with ARM + Video core GPU) based Single Board Computer. The ARM architecture is for holding the entire operating system which is a variant of Linux made especially for ARM processor and a Video Core GPU to work with Open CV, a library for Video & Image Processing in real time. This library also connects the device drivers for camera and GPIO for triggering. The open computer vision (Open CV) is a machine vision technology that will give the feasibility to process images and videos using real time cameras. A glowing LED and rotating servo motor connected to the Raspberry Pi indicate the detection and identification of a rose flower based on specified parameters. The field is fitted with humidity sensors placed at various spots that continuously monitor the environment for humidity levels. It checks these levels with the set point for humidity and alerts the farmer. The alerting mechanism is GSM module that sends a text message to the farmer informing him about the breach in set point. The farmer then responsive or ignore the alert. The water sprinklers, if on, bring down the humidity level thus providing an ideal growing environment to crop. The major concept of the paper fruit picking and pesticide spraying is described under the process domain. Farmers today spend a lot of money on machines that help them decrease labor and increase yield of crops but the profit and efficiency are very less. Hence automation is the ideal solution to overcome all the shortcomings by creating machines that perform one operations and automating it to increase yield on a large scale.

I. LITERATURE REVIEW

Amritansh srivasatava , these worked on DTMF Based Intelligent Farming Robotic Vehicle. The main

objective of machine can also be used to reach the places where farmers make harder efforts for farming such as hill areas, mountains etc. where land is not plane. This is how we can use this robot in different fields as well as for research purpose by further manipulation in programming it can be modified accordingly.

R.suresh, this extensive work on automatic feeding device in rotary cultivator blade shaft welding equipment. It can achieve automation of grab, feeding and placement of all blade and assures holders that the blade holder feeding device and other devices in welding equipment work coordinate automatically it can replace a universal robot to realize welding automation of the shaft weldment. Moreover the biggest advantage of it is easy to operate and lowcost.

Amrita sneha, in this research paper agricultural robot for automatic ploughing and seeding. The concept of fruit picking and pesticide spraying is described under the process domain. Farmers today spend a lot of money on machines that help them decrease labor and increase yield of crops but the profit and efficiency are very less. Hence automation is the ideal solution to overcome all the shortcomings by creating machines that perform one operations and automating it to increase yield on a large scale.

Simon balckmore, in this paper robotic agriculture the future of agricultural mechanisation. Developed agriculture needs to find new ways to improve efficiency. One approach is to utilise available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision

Farming has shown benefits of this approach but we can now move towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way.

Sajjad yaghoubi , autonomous robots for agricultural tasks and farm assignment and future trends in agro robots. This article is the logical proliferation of automation technology into bio systems such as agriculture, forestry,

green house, horticulture etc. Presently a number of researches are being done to increase their applications. Some of the scientist contributions are mobile robot, flying robot, forester robot, Demeter which are exclusively used for agriculture. A brief discussion is being done about the types of robots which increase the accuracy and precision of the agriculture with a camera which is mounted the servo motor in order to rotate in different directions through which we are detecting the objects, so whenever the object is detected using image processing we are comparing the features of the object with rose flower features, if the object is a rose flower then using the motor the robot will cut the flower, also we have connected a buzzer which will indicate the end of the process with a beep sound.

We are also conducting ploughing process in order to grow the plants in fertilized soil as we are using DC motor for this purpose, and also we are using an ultrasonic sensor to calculate the distance and an IR sensor for the obstacle detection.

Python is a programming language which can be easily available. This programming language used in many areas of programming platform. There are thousands of programmers who use this python programming language. Python is easy to understand as compared to other programming languages. Python is a high level programming language. Python has been designed such that it focuses on code readability and a syntax that allows programmers to express concepts. It provides constructs that enable clear programming on both small and large scales.

The easiest introduction to Python is through Thonny, a Python3 development environment. Open Thonny from the Desktop or applications menu:

Thonny gives you a REPL (Read-Evaluate- Print-Loop), which is a prompt you can enter Python commands into. Because it's a REPL, you even get the output of command printed to the screen without using. In the

Methodology—Initialize the buzzer and lcd display Read digital sensor values Motion control Node identification Gripper function

Design— This raspberry pi is connected Thonny application, this is called the Shell window.

Technology – These robotic processes are easily built and are controlled through single board computer, say; Raspberry Pi that captures the live video through a standard USB webcam and will identify the roses in the field.

After identifying the rose through the image processing algorithms which are programmed, it will circle the rose which means the rose has been detected and an LED will glow and servo motors start rotating.

Parts Used— RASPBERRY PI:

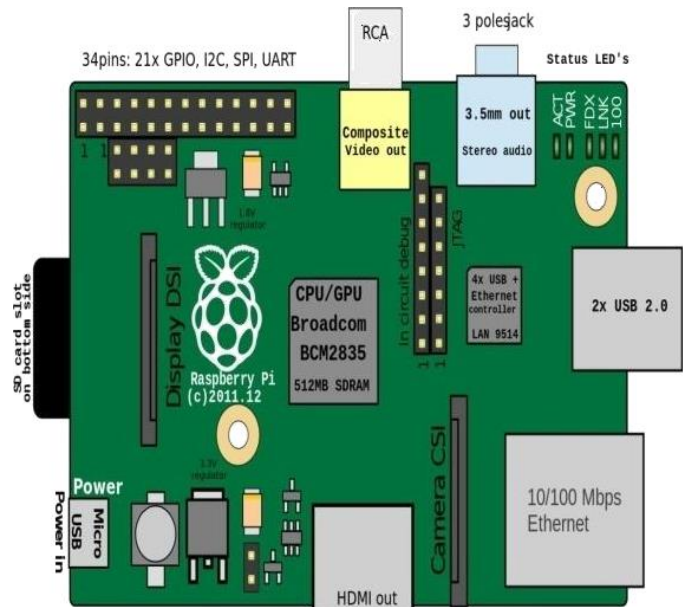


Fig1:Raspberry pi

It is a low cost, **credit-card sized computer** which is used for implementing small projects. A monitor or TV has to be connected with it externally to visualize its operating system and operate it. We can use a key board and a mouse to provide input to it. An external memory has to be used to load its operating system. We can program it with several languages like C++, Python etc



Fig2:camera

creates a video clip camera introduced inside the automobile we can get the picture of the driver. Despite the fact that the camera creates a video clip, we have to apply the

developed algorithm on each edge of the video stream. This paper is only focused on the applying the proposed mechanism only on single frame. The used camera is a low cost web camera with a frame rate of 30 fps in VGA mode. Logitech Camera is used for this process is shown in figure2.

DC MOTOR:



Fig3:dc motor

The face detection method used in OpenCvis developed in 2001 by Paul Viola and Michael Jones, very well referred to as the Viola-Jones method. Though this method can be used for several objects but most specifically here it is used for face and eye detection in real-time.

CAMERA:

Utilizing a web camera introduced inside the automobile we can get the picture of the driver. Despite the fact that the camera

A DC motor is any motor within a class of electrical machines whereby direct current electrical power is converted into mechanical power. Most often, this type of motor relies on forces that magnetic fields produce. Regardless of the type, DC motors have some kind of internal mechanism, which is electronic or electromechanical. In both cases, the direction of current flow in part of the motor is changed periodically

The speed of a DC motor is controlled using a variable supply voltage or by changing the strength of the current within its field windings. While smaller DC motors are commonly used in the making of appliances, tools, toys, and automobile mechanisms, such as electric car seats, larger DC motors are used in hoists, elevators, and electric vehicles. A 12v DC motor is small and inexpensive, yet powerful enough to be used for many applications. Because choosing the right DC motor for a specific application can be challenging, it is important to work with the right company. A prime example is MET Motors, which has been creating high-quality permanent magnet DC motors for more than 45years.

MOTORDRIVER:



Fig4:motor driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DCmotor with a single L293D IC. Dual H- bridge Motor Driver integrated circuit(IC).

It works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, Hence H-bridge IC are ideal for driving a DC motor. In a single L293D chip there are two h-Bridge circuit inside the IC which can rotate two dc motor independently. Due its size it is very much used in robotic application for controlling DC motors. Given below is the pin diagram of a L293D motorcontroller.

SERVO MOTOR :



Fig5:servo motor

First let us consider the circuit connection of servo as shown below. Here the Red wire is connected to +5V regulated power which can deliver current up to 1Amp, Brown

wire is grounded and Orange wire is connected to PWM (Pulse Width modulation) output of a microcontroller. In the circuit if microcontroller and servo has different power sources then the microcontroller ground needed to be connected to servo ground.

BUZZER:



Fig6:Buzzer

A **buzzer** is a small yet efficient component to add sound features to our project/system. It is very small and compact 2-pin structure hence can be easily used on breadboard, Perf Board and even on PCBs which makes this a widely used component in most electronic applications. There are two types are buzzers that are commonly available. The one shown here is a simple buzzer which when powered will make a Continuous Beeeeeeppp. sound, the other type is called a readymade buzzer which will look bulkier than this and will produce a Beep. Beep. Beep. Sound due to the internal oscillating circuit present inside it. But, the one shown here is most widely used because it can be customized with help of other circuits to fit easily in our application.

This buzzer can be used by simply powering it using a DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6V DC supply. The buzzer is normally associated with a switching circuit to turn ON or turn OFF the buzzer at required time and require interval.

II. RESULTS

The goal of the agricultural is additional than simply the appliance of robotics technologies to agriculture.

III. CONCLUSION

Thus an effective system for Rose Flower harvesting prototype has been done with a Single board computer say Raspberry Pi, which is of SoC based ARM architecture with GPU system (Graphics Processing Unit). So instead of using bigger kind of giant robotic system, it is also possible with miniature type Embedded based Robotic Systems which is

governed by Linux Operating Systems. By reducing the Kernel size and avoiding unwanted libraries or Package installations, a high Speed System can be developed easily with time and money. Servo runs with different angle given in code, we can change the setting of angle of rotation of servos.

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PERSONAL PROFILE



Assistant Professor. Nithin.H.V.
Electronics & Communication
Engineering from PESITM SMG.

EmailID:

hvnithin@pestrust.edu.inAsst.Prof.
Nithin.H.V.

Project guide

His area of Research interest
include Wireless Sensor Networks,
Computer Networks etc.,



Name : Arpitha L
USN:4PM16EC010

EmailID:arpithajlokeshappi@gmail.
com Contact Phone No:9731827700



Name: Chaithra KC
USN:4PM16EC015

EmailID:chaithrakc@gmail.com
Contact Phone No:8971510447



Name: Deepa Hondad
USN:4PM16EC018

EmailID:deepahondad15@gmai.co
m Contact Phone No:8105085670



Name: Bharathkumar HS
USN:4PM17EC403

EmailID:bharathhalepete@gmail.co
m Contact:PhoneNo:9535384966