

IOT Controlled Flower Plucking Vehicle With Multipurpose Robotic Arm

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Abstract- In many situations, autonomous robots can provide effective solutions to gruelling tasks. In this case, it is desirable to create an autonomous robot that can identify flower and cut them if the flower meets certain cutting level. Dealing with a special flower is a very menial task, this is an excellent application for a robot of this type. In this case, to keep costs and design complexity low, the robot is designed around the platform and uses several different sensors including camera to collect information about the flower environment to allow the robot to react accordingly.

Keywords- Microcontroller, Raspberry Pi, Internet of things, Android, Robotic arm.

I. INTRODUCTION

Over the past twenty years, as robotics has become a scientific discipline, research and development have concentrated on stationary robotic manipulators, primarily because of their industrial applications. In many situations, autonomous robots can provide effective solutions to gruelling tasks. In this case, to keep costs and design complexity low, the robot is designed around the platform and uses several different sensors including camera to collect information about the flower environment to allow the robot to react accordingly. The robotics is the study which consists of electrical engineering and mechanical engineering. The robotic arm used here is to pick and place an object. It can be used as a whole robot or it can also use as a part of the big robot. The arm of robot moves forward and backward directions. Also another joint moves left and right directions of the robotic arm. This system is very beneficial for places where there is a need to cut and pick an flower move to some other place safely. If the special flower is being picked by a human, there is a risk of damage to the flower look which is avoided by this system. The system provides a robotic arm that is controlled by IOT. This system includes a vehicle so that the robotic vehicle can be moved to cut and pick the flower with the help of robotic arm. The system uses microcontroller that is interfaced to the IOT module. This IOT module receives commands that are sent by the joysticks in app. As soon as the user touches the joystick, the commands are sent to the IOT

module, which makes the arm move in the specified up or down direction or grip open or close. Thus this Remote Controlled flower cut and Place Robotic Arm Vehicle project can be used to safely get from the plant, cut it and place it safely anywhere you want.

II. LITERATURE SURVEY

1] IOT Based Wheeled Robotic Arm

Author: Professor P.K.Mani , Abhilash V

Published in: 2018

This paper proposes a system in which the robot used wheeled robot. it is very energy efficient, the wheels can move very freely and quickly through the smooth and hard surfaces. For the legged robots it took time and need more commands to get forward, backward or any direction movements. he command to the robotic arm is given through the Internet of Things using a mobile phone to transmit the data or give the command to the robot. In the mobile phone a android Blynk application to control the robotic arm. In the robotic arm use Wi-Fi connection for the internet connectivity. The Wi-Fi can be connected to the microcontroller which we use in the robotic arm. With the Internet of Things we can control the wheels of the robot as well as the arm of the robot.

2] Design and Implementation of Robot Assisted Surgery based on Internet of Things (IoT)

Author: Mohamad Khairi Ishak, Ng Mun Kit

Published in: 2017

This paper presents a controllable robotic arm via the use of the Internet of Things (IoT), a smart phone will be used to control the robotic arm. An accelerometer and a gyroscope are used to capture the gestures and postures of the smart phone. The signals of the accelerometer and the gyroscope will be captured by an Android application and sent to a Raspberry Pi to control the robotic arm. By integrating the

Internet of Things (IoT), a worldwide controllable robotic arm is achieved. The Android application is developed by using Android Studio. Python script is employed in the Raspberry Pi to develop a program that will be able to control the robotic arm and to receive the commands from the smart phone. A system with a kinematic model will be used in the Raspberry Pi to control the robotic arm. Besides, a video streaming from computer is implemented to monitor the robotic arm.

3] War Field Spying Robot With Night Vision Camera

Authors: Aaruni Jha, Apoorva Singh ,Ravinder Turna ,Sakshi Chauhan

Published in: May 2015

This paper RF based spying robot attached to wireless camera that can reduce human victim. This robot sends signal to the base station using wireless camera. Android phone is used to control the movement of the robot. The robot sends the signal to RF receiver mounted on the robot via RF transmitter at the base station, with this feature robot can transmit real time videos with night vision capabilities and can't be identified by the enemies. It uses 8051 microcontroller which controls the motor and wireless camera as well as receiver and transmitter unit. The aim of the paper is to view things accurately that are happening in the surrounding area, to all this control is needed where controls RF signals are used. By using this signal encoding is done and signal is sent to the transmitter which gives input to drive the motor it is used as short distance spy robot.

4] Design and Implementation of e-Surveillance Robot for Video Monitoring and Living Body Detection

Authors:Dr Shantanu K .Dixit ,Mr .S.B Dhayagonde

Published in: April 2014

This paper purposes the system application could detect living bodies with the help of PIR sensor and to control the robot with the help of internet. The camera mounted robot is able to move horizontally and vertically around its vertical axis. Camera movement is controlled through the webpage by the user and providing with enhanced view of the surroundings. PIC 16F877 is used for controlling dc motors which is used for collecting data from PIR sensor for detecting living being. This technology gives helping hand to our security forces for detecting intruders. Also, used in finding the injured persons during disasters such as earthquakes,

collapsing of buildings, in mining fields and can be used as a spy robot

Motivation

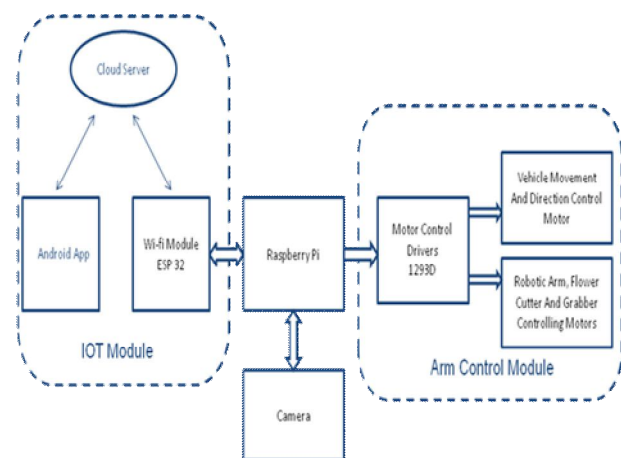
In some cases, the delicate flowers it has to be precisely cut ,if humans cut there is a chance of flower getting wasted more due to this the lose in unbearable, its motivated to develop robot . The purpose is to avoid energy crisis and reduces the human efforts, maintenance cost and time is being lost during a job which is naturally redundant.

Problem Statement

Problem in difficulties in many flowers example rose thorns keep hurting mostly their hands, their clothes get thorn and they have to keep their posture in bending position facing the ground for harvesting of flowers which leads them to severe pain in their backbone ,leg and feet. Number of labours requirements and also wastage flowers.

III. METHODOLOGY

The proposed system consists of two block one is controlling unit which is fully IOT based android app, another block is robotic block. In the controlling section robotic block is controlled using different commands using android app. The android app consists of joystick for controlling the robotic arm, flower cutting, flower grabbing. The movements of the robotic vehicle is controlled using steering in the android app. The robot section included with camera to get the visual data of the scenario, which helps to control the movements of the vehicle and helps to identify and collect the flower.



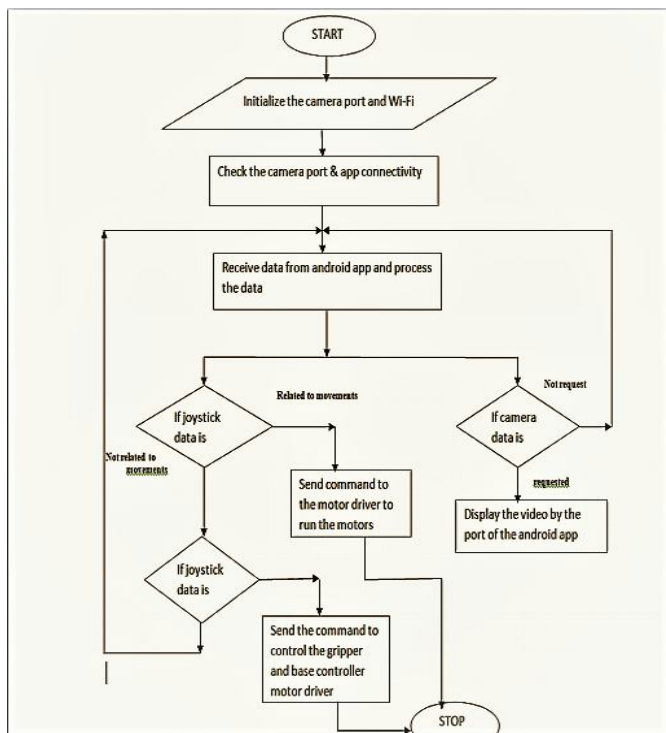
Block Diagram Of IOT Controlled Flowers Plucking Robot

The flower can be detected from the camera then the visual data is transmitted to the app, where the user can control the robotic arm with cutter and grabber to collect the

flower and store in the good position. The cloud server is the median between the controlling block and robotic block. It helps to collect the data from the robotic part and the sends the data to controlling part. The robotic movements are controlled by the microcontroller according to the data received by the cloud server using WI-FI module. The microcontroller acts according to the received data and controls the motors of the different sections of the robot with the help of motor control drivers.

The design flow of the purposed system is show below. The hardware configuration of this project is using a Raspberry as the main controller for the robotic arm. Raspberry Pi is a microcomputer with built-in Wi-Fi. Wi-Fi in Raspberry Pi allows devices to communicate in a wireless fashion through the Internet.

For video streaming, Raspberry Pi also comes with a camera serial interface (CSI) which allows us to connect to a Pi camera. At the same time, an Android app is used to control the robotic arm. A Raspberry Pi camera V1 is used to interface with the Raspberry Pi. An Android application called blynk is used because it is easy to acquire and build-in joystick which can be used for controlling the robotic arm and the movement of the robotic vehicle. By the app it can capture the gestures and postures of the smart phone. The signals by the joystick will help to capture the gesture and movements by an Android application and sent to a Raspberry Pi to control the robotic arm.



Design flow

Motor Driver

Motor Drivers are the IC used to control the Motors used in a component. The Motor Driver used here is the L293D. The motor driver is used to control the rotation motion of the DC motor. It is fixed to the DC motor in the robotic arm. We use four DC motors in the robot.

Wifi module

Node mcu ESP-32E WiFi module is developed by Ai-thinker Team. core processor ESP8266 in smaller sizes of the module encapsulates Tensilica L106 integrates industry-leading ultra low power 32-bit MCU micro, with the 16-bit short mode, Clock speed support 80 MHz, 160 MHz, supports the RTOS, integrated Wi-Fi MAC/BB/RF/PA/LNA, on-board antenna. The module supports standard IEEE802.11 b/g/n agreement, complete TCP/IP protocol stack. Users can use the add modules to an existing device networking, or building a separate network controller.

RASPBERRY PI 3

It is a development board in PI series. It can be considered as a single board computer that works on LINUX operating system. The board not only has tons of features it also has terrific processing speed making it suitable for advanced applications. PI board is specifically designed for hobbyist and engineers who are interested in LINUX systems and IOT, that can be used for many tasks that your computer does, like games, word processing, spreadsheets and also to play HD video.

BLYNK

The BLYNK application is a mobile phone application which is used to connect the Arduino with the mobile phone. Using the BLYNK application we can command to the robotic arm to make the robot to work. The things we needed to control the robotic arm by BLYNK is by the internet connection to both the mobile and the Robotic arm. In this application we can arrange the control panel and access and control the controls as we wish.

IV. CONCLUSION

In this paper we are planning to design the iot based flower cutter and grabber with multi usage robotic arm. The whole system is supported by the internet protocols which helps to operate the robot across the globe.

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