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VOICE CONTROLLED HUMANOID ROBOTIC CAR FOR SMART AGRICULTURE USING ARDUINO AND ANDROID SMART WATCH

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Abstract: Agribusiness is most critical fields in our everyday life. Be that as it may, individuals travelling from provincial to urban region are most basic issue in today's agri. So to give more profit in this it incorporate shrewd agribusiness in view of observing through android watch which is wore by farmer with the goal that the individual can screen the products and ranch arrive through watch. It includes monitoring of dampness of yields deformities of harvest, temperature of products, appropriate water system and environmental factors consistently. Different hubs are settled on various regions in the land. Controlling these sensors through robot with interfacing through android watch, Wi-Fi,arduino board. This task is made as an undertaking and given to the farmer's welfare.

Keywords: Sensors, Android Watch, Arduino board, Raspberry-pi, Voice Command, Robot operation, Wi-Fi network.

1. Introduction

As the world is going under the keen framework and different new technologies. It is important to incline these features into horticulture too. Most system is completely sent at different hubs and with the accumulation of remote sensor network and conventions. Numerous examines are done mostly in horticulture just these days. So it is important to incorporate keen framework in agriculture. The required information that is collected based on the farming are completely smart controlled framework with the assistance of android watch detecting through voice controlled processing by automated auto. In dislike to lessen all these problems in expanding the yield of the crops it is useful to actualize these systems in horticulture. Despite the fact that it is executed in research level just it isn't even now given to the ranchers as a venture yield to get benefitted from the asset. This is fully based on the interconnection amongst the farmers and with different communication methods. It is change from the wired gadget to the remote gadget.

In this paper we display a robotic car, with easy to understand design, Bluetooth sensor, and different advanced sensors, (for example, light sensor, moisture sensor, moistness sensor, temperature sensor, weight sensor, contamination sensor, damage of harvest sensor) .It is completely controlled by voice recognition charge worked by the farmer from wherever the individual works apart from the ranch arrive. The principle advantage of this framework is the farmland is completely checked by the farmer through watch from where the person work or far separated from the land. The individual can detect the full perspective of the land by getting different warnings of the crops detecting through watch. Subsequently this paper absolutely bargains with the improvement in farming from normal horticulture to keen agriculture through new innovations by including android watch through Bluetooth with interfacing them in arguing board with the help of voice charges.

2. Experimental Setup

We have planned an automated car consist of mechanical outline with electronically controlled wheels which can be worked through voice acknowledgment by farmer through android watch which is connect with the mechanical auto with the help of interfacing in arduino board consisting of different sensors, for example, light sensor, moisture sensor, mugginess sensor, temperature sensor, weight sensor, pollution sensor, harm of product sensor. The movement of the robot is forward direction too the regressive direction and both sideward. The gadget is fully designed when the harvest is influenced the notification is sent to the rancher through watch with the assistance of Bluetooth technology. With the goal that the agriculturist can work the robot through voice by saying the direction which is encoded as numbers.

3. Hardware Design Of The control System In Smart vehicle

The equipment engineering of the savvy vehicle's control framework is based onμC/OS-II. Figure 1 demonstrates the principle parts of this framework. Keen auto control system incorporates the accompanying modules:

3.1 Control module

The control system of miniaturized scale controller utilizes NXP's LPC2138.It is in charge of voice summon signal, voice playback of encoded signals, LCD display, joystick control flag, the remote control signals, ultrasonic flags in case of debilitated obtaining and DC motor PWM speed control signals, ultrasonic signals begin to send, keeping in mind the end goal to accomplish the functional modules worldwide coordination and control.

3.2 LCD module

The control system uses SMG240128 LCD module as shown in human-PC interface. The driver uses advanced ZLG/GUI package. ZLG/GUI are created by Zhou, which is a graphical UI bundle. Color graphical interface is shown on LCM, which is utilized C dialect that is simple to transplant. Highlights incorporate essential geometry rendering, window manager, icons, menus, dropdown menu, English text show, the shading transformation. Friendly interface can make the equipment and software investigating more compact, simpler to control.

3.3 Voice recognition and playback module:

Speech recognition and identification training phase is divided into phases training phase of the task is to establish the basic unit of recognition acoustic model. Identification stage is to analyze the use of speech analysis speech feature parameters, according to certain criteria and measure compared with the system model, the recognition results obtained by the judge. The voice recognition module in the system is limited mainly to the five voice commands(forward, stop, backward, turn left, turn right order) to identify the judge, and the command signal is encoded by the I/O Porto send to the main chip, the master chip signal processing for the command, call the appropriate subroutine to make the appropriate action to respond. Voice playback chip integrates voice signal amplification, filtering, sampling A/Conversion module.

3.4 Joystick control module

It is mainly consisted by the multi-pivot controller, joystick, hand brake switch, move button, handle, and wires. It's driving the car moves, for example, forward, in reverse, turn left, transform right and stop into corresponding electrical flag through the ARM I/O port information. ARM gets control order, calling the appropriate function. The PWM controls the flag, in order to accomplish the auto's engine drive control.

3.5. DC motor driver module

It uses ARM chip PWM beat width modulator to drive DC motor, by changing the duty cycle of the PWM banner to the DC motor speed controller. Through the H-bridge circuit to the motor exchanging control ,the specific DC motor control drive circuit is shown in Figure 2.DC motor drive circuit uses a FET driver optically withdrew, so that the DC motor will work with the ARM embedded structure control supply to isolate the work to improve the ARM control system constancy and soundness.

3.6. Engine speed location module

Engine shaft speed criticism circuit detection framework utilizes incremental optical encoder to distinguish the genuine speed of DCmotor. Optical encoder flags are generally VCC, GND, A, B and Z, where only the associated control and A flag, as the DC engine shaft position and velocity feedback flag. Heartbeat encoder feedback signal is traversed select coupler OC on the encoder yield signals with internal pull-up resistor (Figure 3 R1). Through there channel after the flag sent to the Armand to the outer interfere with discovery isgood, to accomplish the speed feedback.INT0,it is watched that, in the INT0, the interrupt benefit routine of the DC motor speed.
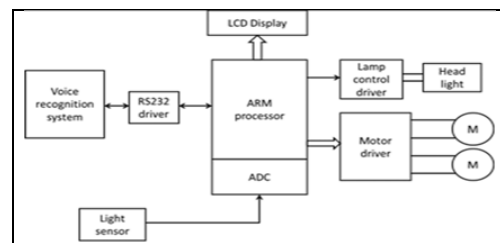

Fig 1: Engine Speed Location module
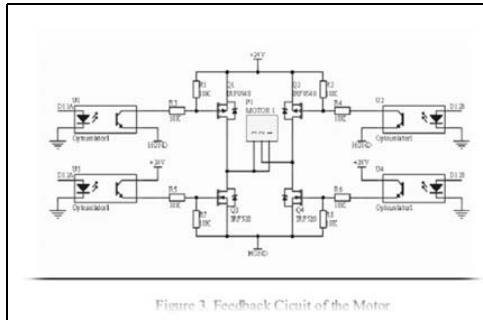
4. Block Diagram For Roboticcar

Fig 2 Feedback Circuit of Motor

5. Software Design Of the control System In Smart vehicle Hardware Used

1. Arduino board
2. Voice recognition system
3. LCD display
4. Light sensor
5. moisture sensor
6. humidity sensor
7. temperature sensor
8. pressure sensor
9. pollution sensor
10. damage of crop sensor
11. Head light
12. Motor

5.1 Arduino Board

EasyVR is the second generation version of the effective VRbot Module. Its a multi-reason discourse recognition module intended to effortlessly include versatile, robust and practical speech recognition abilities to for all intents and purposes any application. The EasyVR module can be used with any host with a UART interface powered at 3.3V – 5V, for example, PIC and Arduino sheets. Some application examples incorporate home robotization, such as voice controlled light switches, locks orbed, or including "hearing" to the most popular robots available.

5.2 Lcd Display

The LCD utilizes the HD44780 series LCD driver from Hitachi, or equivalent controller. The LCD is associated with a female 14-stick connector for simple interface with the BS2p24/40 Demo Board and the Professional Development Board.

5.3 Image Of Lcd 2x16

Notifying the farmer. Three pins are usedin this sensor. Input, output , ground.
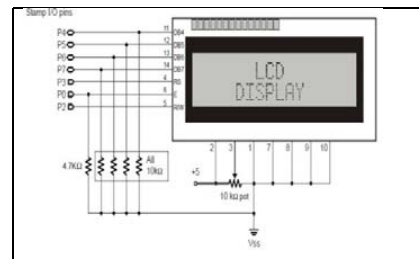

Fig 3 Image of LCD Display

5.4 Voice Regonition Controls

Zero – „ 0 „   Stops the vehicle
One – „ 1 „   Runs in forward direction
Two – „ 2 „ Runs in reverse direction
Three –„ 3 "   Turns left
Four – „ 4 „   Turns right
Five – „ 5 „   Applies break
Six – „ 6 „   Head light glows
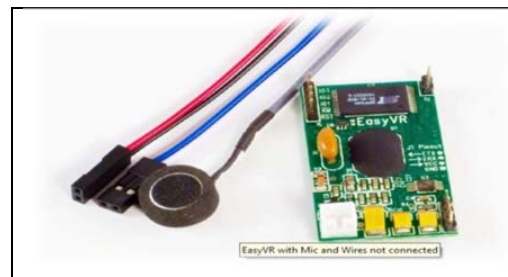Seven –„ 7 „   Head light turns off

Fig 4 Voice Recognition Controls

5.5 Soil Moisture Sensor

It is used to check whether the moisture of the soil is according to the normal level of the actual crop or not. It is helpful for robot car to sense the moisture of the soil.

6. Conclusion

Comparing to the other technologies in agriculture, this system will help the farmer to do the work from whatever place they are. So that they can easily access the robot

and do the operations. This paper designs a wireless system using arduino, sensor node as combination of sensors. So that the data will be analyzed transmitted and processed according to the voice command of the farmer which can be easily configured Torun out the application. Since it is little high in cost but the outcome will more helpful for the environment. One best advantage in this system is low power consumption. Easy to handle, Flexible tower and take to any places. But the distance of processing is smaller in this system. That's the second disadvantage in this system.

7. Future Work

Future work will be designing this system with low cost so that in rural area also agriculture will be easier. And making the system to work on long distance so that the famer can access the system at far distance also. Such a system is more useful in many environmental monitoring and processing.

References

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