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A DETAILED REVIEW OF DESIGNING THE AGRIBOT

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Abstract - *The high-tech industry is growing, young graduates, new companies and new investors are representing. The cycle of paddy growth is obstructed by weeds in a developed area. The technology is increasingly expanding, encouraging not only the farmers ' production capacity but also robotic development and automation. Rather than using herbicides, the use of living things and physical measures such as heat or illumination inhibit the development of weeds through the cuts and adjustments of machines. Repetitive function, such as field seeding, kindergarten planting, fertilization and drainage, weeding and spraying, is very helpful for robotic systems combined with different control procedures. In this Survey, We discussed about the Optical measurement system for organic farming. One of the advanced technology is Smart irrigation System. Which would help to prevent the overflow of water. The Harvesting of fruits is done manually and is very labour intensive. One of the important technique to reduce the Man power and time Consumption is Fruit Picking robot.*

This paper is based on agricultural innovation. The introduction is described in section 1. In Section 2, the Literature Survey tells a brief history. The 3rd section describes the overall project summary. Section 4 illustrates the project's conclusion

Key Words: Fruit picking Robot, Hydraulic Arm, Micro-Robot, µVision4 software.

1.INTRODUCTION

An integrated gadget is a type of computer device designed to accomplish several tasks that are available, stored and managed in various mainly electronic frameworks. Embedded systems are a combination of hardware and software that usually refer to the device as hardware-embedded firmware. One of its most important features is the availability of o/p within the time constraints. Embedded systems make the work simpler and more relaxed. Thus, in simple and complicated systems we also often have interconnected frameworks. The precision and speed at which robots can increase yields and reduce waste from plants in the field are among the most common robotic applications in agriculture. Nevertheless, such systems are often hard to simplify. For starters, there are many barriers to a robotic system designed to pick sweet peppers. Vision systems need to assess the situation and sophistication of peppers under severe conditions like smoke, various candle strength, temperature fluctuations, and wind motions. Nevertheless, specialized vision systems are still required to pick a plant. A robot arm must conquer areas with as many obstacles to grab and position a pepper delicately. This method differs greatly from the selection and positioning of a metal piece on a sheet. During a dynamic environment, the agricultural robotic arm should be stable, and accurate enough not to hurt the peppers when picked. Farmers are becoming very popular in harvesting and picking machines, however, there are hundreds of other innovative ways in which farmers use robotic automation to improve their yields. The demand for food goes beyond the farmland available, and this void must be closed down by farmers. Farming robots help them do just that.

2. LITERATURE SURVEY

Agriculture is the art of growing crops and cultivating the soil. It includes several activities, specified planting crops, growing fruit trees and harvest of such kind merchandise. It's one reasonably courageous of our Indian economy. Within the past days, agricultural activities area unit is done by the persons UN agency area unit concerned in farming. However in trendy days, the young generation's area unit busy with their works. So we tend to area unit want automation in agriculture.

A) In knoll, [1] they proposed an optical measurement system for organic farming, the following research steps are listed in chronological order.

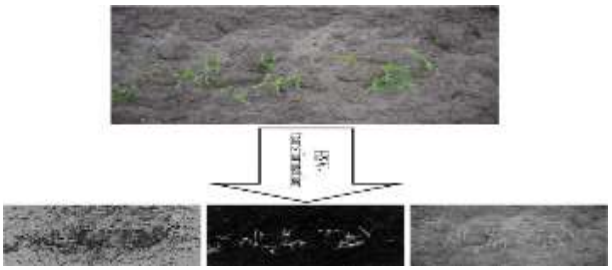

Fig -1 Transformation of a RGB image into the HSV color room.

At the beginning of their research, they investigated different plant stem emerging point search algorithms to successfully remove the weed. They presented the first research results of two RGB vegetation index determination methods. These two methods don't need expensive and sensitive bi-spectral cameras.

Here, a new and improved algorithm for segmentation of the vegetation from the background was

mathematically derived and verified by the Dice-Score. The segmentation algorithm requires only one RGB camera and achieves accuracies of over 96%.

B) In this paper [2] a sensible irrigation system has been accustomed to give irrigation supported soil wetness. Soil wetness testing aims to understand whether or not the soil is in dry condition or it's in wet condition. For this purpose, the ATMega328 microcontroller is used. It deals with an associate automatic plant irrigation system that mechanically senses the moisture content of the soil and judges whether or not irrigation is needed or not and the way a lot of water required {is required} for soil. This method uses the AtMega328 microcontroller. It's programmed to sense the moisture content if the soil over an amount of your time. When the moisture content is a smaller amount than the limit that is predefined, it will start to supply the required quantity of water until it reaches the limit. Thus once the soil is dry the pump can mechanically water the fields and once the soil is wet the pump can mechanically switch off, thereby eradicate the requirement of the workforce and conserve the time.

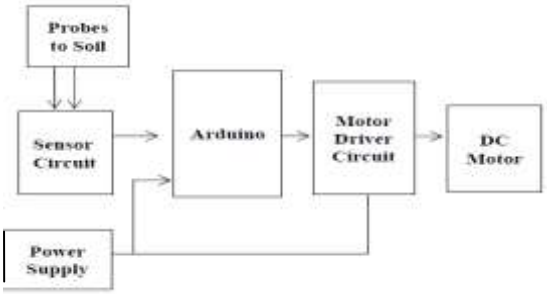

Fig-2 Block diagram of Automatic plant Irrigation System

Only within the dry condition, the pump can be operating, since the necessity of water is added for that soil for the proper growth of the crops and in wet soil, the pump won't work since the soil doesn't want any water thanks to the presence of water in it. Hence this project can conserve water throughout irrigation.

C) In this paper, Autonomous Ploughing and Seeding [3] strives to develop automation capable of performing arts operations like automatic tilling, seed dispensing, fruit choosing and chemical spraying. It also offers manual handling when necessary and controls the moisture tabs with the aid of moisture sensors. The main part here is that the AVR At mega microcontroller that supervises the whole method. at first, the automation tills the whole field and takings to tilling, at the same time dispensing seeds aspect by aspect. The device used for navigation is an unhearable device that unendingly sends the knowledge to the microcontroller. On the sector the automatic operates on machine-controlled mode, however outside the sector is strictly operated in manual mode. For manual management, the mechanism uses the Bluetooth pairing app as a management device and helps within the navigation of the automation outside the sector. So we tend to use a robotic transportable to overcome those limitations.

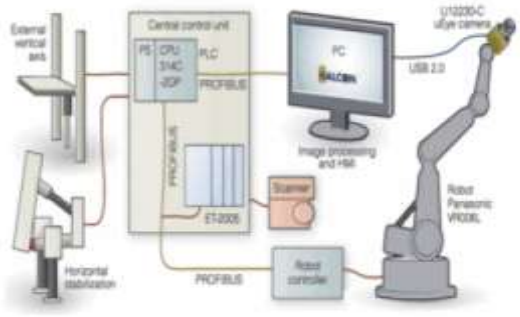

Fig-3 Fruit picking mechanism of the robot

Fig 3 describes how fruit selecting is done the use of a hydraulic arm and picture processing. Here we are in need to use a camera for capturing photographs and we also need a fruit gripper which is an arm tool to choose the fruit with in-depth care. The position of the digital camera is controllable because the camera is placed inside the gripper. The digital camera can point its optical axis at the fruit, reducing photograph distortion and disposing of calibration steps that take location repetitively in the course of apple picking.

D) Smart farming is a rising concept because IoT sensor's successful in providing statistical about their agriculture fields. Paper [4] Variations in weather conditions will affect the crop's great yield. For optimal growth and health, plants need to correct specific conditions. Watching the crop field condition is bad, so the sensor area device used. The infrasound temperature thermometer detector is used; it is optical control and side engine combined. In conjunction with the cameras, the humidity sensor-HDC1010 controls the relative humidity of the air between the farmland. The camera is attached to the CC3200 camera booster box via the MT9D111 camera detector, a PCB victimization tool.

Table -1 Power Modes

MCU POWER MODES	Networking sub systems		
	Disabled	LPDS	Active
Hibernate	Hibernate	N/A	N/A
LPDS	LPDS	LPDS	Active
Sleep	Active	Active	Active
Active	Active	Active	Active

CC3200 has energy modes based on the following three aspects. The power mode of the microcontroller subsystem is controlled with the aid of the MCU application. The power mode of NWP maintained automatically and chip-level strength mode is controlled with the aid of the mixture of MCU and NWP mode.

E) In Paper [5], Voice Control for smart Automation it explores the opportunity of the usage of existing voice popularity tools that allow you to upload the voice control interface to the prevailing smart home automation system. The desire of the voice popularity engine influences the architecture of the voice command interface and determines its performance. They talk about the feasible architectures of the voice-enabled smart domestic automation systems. Then, they talk about the algorithm like speech to text and text to speech engines and analyze the possibility of the usage of them inside our system.

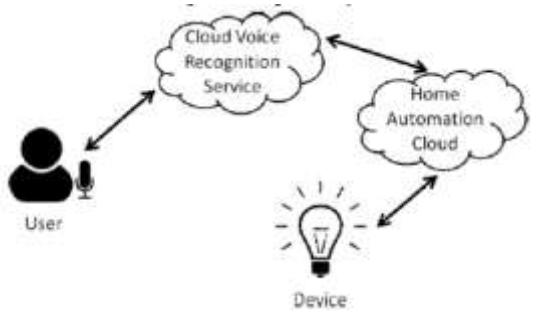

Fig-4 Voice controlled Protocol

The architecture of the voice-enabled HA system based on cloud voice recognition service and third party recording devices.

F) Arduino using autonomous agribot in paper [6] spells out the complete set up of the agribot which includes hardware and software. Ultrasonic Sensor and Digital Compass sensor is used with the help of the Wi-Fi interface operated on Android Applications.

G) In this paper [7] Weed detection, Agribot Automation can assist in achieving sustainable agriculture by large scale robotics and micro-robots to increase production while reducing increasing stresses on the ecosystem.

Guidance: The way vehicle precedes the defined path within the agricultural field.

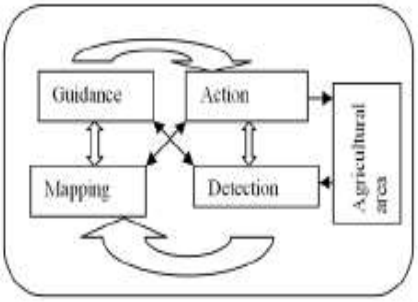

Fig -5 Relation between the Abilities of Service

Mapping: building a visual presentation of the agricultural area.

Detection: Finding out of a biological feature with means of a specific device (sensors) or method.

Action: Execution of the task with the help of end effectors for which the vehicle is designed for.

Most of the self-governing agriculture motors are used for agrochemical dispersal, irrigation; harvesting, weed detection, terrain levelling, etc. Are manned and aren't completely automated in functioning.

H) Smart Farming with Agribot Paper [8] goal is to create "robot farms" where all the works will be done by the machines. Agribot performs two operations digging hole that is ploughing in the field and then planting a seed at a regular interval and covers the ploughed area with soil. To seed, the stepper motor is used and to dig a hole spike wheel is used. When the robot starts performing at the same time it can detect obstacles in the path using IR sensors PSCO controller is used to controlling all the operations. To increase productivity and ease their work with its multitasking working features. By developing this it overcomes the difficulties in their fields in every season no matter what is the weather. With the different sub, modules can be used for redemption and agricultural purpose.

I) Agricultural Task of Automation Smart Farming using Sensor [9] goal is to smart the farming with sensing system and movable smart irrigator. The smart farm sensing system senses the moisture content with the aid of the Soil Moisture Sensor. It can control the system by having wireless communication with the GSM module through mobile phones. The recorded readings are transferred to the database server from which all the crop-growth details are analyzed and transferred to the irrigator system.

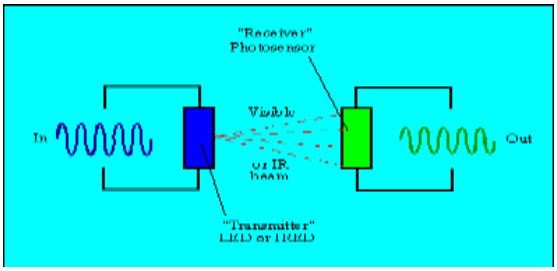

Fig-6 Opto coupler basic working model

In the irrigator system, the opto coupler acts as a sensor. When the signal is received at the GSM module, the microcontroller switches the opt coupler.

J) Farming Robotic Vehicles with DTMF in this Paper [10] set a goal of automation in seed sowing, pest control, obstacle avoidance, soil moisture detection and robust control by a cell phone, through this farming machine communicate from a very large distance

Fig-7 Simulation of Code in µVision4 software

In this we are controlling the rover through a wireless communication system using DTMF technology.

Table -2 Different Methodology and Purpose Of Agribot

Reference	Methodology	Purpose
[29]	Digital Image Processing	To view the Automatic process
[7]	AT MEGA 328 Microcontroller	To check the condition of soil
[11]	AVR AT MEGA Microcontroller	For the purpose of Autonomous ploughing &Seeding
[18]	Arduino & Cloud Server	For the purpose of Voice Controlled Smart Automation Agribot
[15]	IOT Sensors &Microcontroller	To check the weather Condition
[8]	MIT App, Ultrasonic Sensor & Solar Panel	For the purpose of obstacle detection as well as use the solar battery
[13]	Stepper Motor And PSCO Controller	Agribot Farming
[6]	GSM Module	For the purpose of Movable irrigator System
[14]	DTMF Algorithm	Soil Moisture Detection and Robust Control by Phone

3. Summary

We also addressed in this chapter the value of agriculture, its conventional methods, and patterns about efficient output and consumer requirements. As we all recognize, in every field production must be equivalent to the demand and supply ends, and definitely can not be achieved without technical penetration into the industry. We have further reduced our exploitation through their data rates and the most valuable fields of accessible technology and networks in the field of wireless communication. We have also developed the concept of SMART and its significance for overcoming the need for human involvement or selection in the future in the continuity of wireless technologies. In the context of human behaviour, development, climate change, the economy and proper regulation we have disused the problems and some of the approaches we have suggested. With this perspective, which is not that easy to deploy, because the customer does not embrace it readily because of their pre-benefit expense, the socio-economic challenges often provide a compelling debate. In the end, we did not only miss the benefits but also tabulated them. The chapter ends with a brief discourse on areas in which change is important.

4. CONCLUSIONS

Weeding Robot was designed and tested for the proposed Android App. This provides an interface between man and machine. This machine has been designed to quickly eliminate the herb. The rover of the neck operates regularly. There are two phases to this initiative. Another consists of a rover that drives the crop along the appropriate lines. The weapon is the plant control machine. The voice order was analyzed. Robotics develops even faster in developing countries because all operations must be streamlined to make this technology a productive machine in agriculture. The main problem was that the weeds cannot be differentiated from main crops by autonomously weaving robotics so we suggested that the robot be educated and controlled to prevent malfunctioning.

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