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COLOR BASED VEGETABLES AND FRUIT CUTTER AND SORTER USING ARDUINO

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ABSTRACT
In the document, the ESP8266 WIFI module is used to provide control signals to the machine. The received control signal is transmitted to the arduino. Arduino is used in conjunction with the universal asynchronous receiver transmitter. Seven motors with three motor controllers are used for the movement of the unit. There are two L293D high-power motor drivers. One of the engine impellers is used to manage the motion of the wheels in all directions. Second motor driver is used to control up and down movement of the arm, and also controls the cutting action. When the sensor detects color, it triggers the cutting action. Once the vegetables leave the factory, they are placed directly on the tray and the vegetables are transferred to the corresponding compartment of the container according to their color.

I. INTRODUCTION
Agriculture is the pillar of India. "The discovery of agriculture is the first step towards civilized life." One of the famous Arthur Keith quotes. The above line highlights that agriculture becomes a very important part in the development of each country. From beginning, agriculture was a method of earning income by producing food for humans. Today, a large amount of land is being developed for the production of various crops. India is a great agricultural country. Agriculture is the main occupation of India. India's economic situation is highly dependent on agriculture. The agricultural process involves various actions that need handling of large materials. Some examples in traditional are plowing, where farmers use heavy-duty plough.

Nearly 70% of India's population lives on agriculture. There are several activities that need to be improved to achieve effective agriculture. Some of them are plowing, sowing, watering, weeding, fertilizing and harvesting. When watering their crops, farmers use the ancient method of transporting water through heavy pipes. All these processes are time-consuming and laborious. All of these processes require more manual skills and worker power. Therefore, it is necessary to adopt new technologies and skills to increase agricultural production. At the same time, the population of India is growing day by day. Therefore, it is necessary to improve the agricultural profession to fully meet the demand. In present days farms are anticipated to produce higher yields and quality at bottom most price in a justifiable way that has reduced dependent on labor. The application of digital agriculture and precise management of specific locations are few possible answers, which depends on sensor technology, and also in addition to continuous field data collection that can only be achieved through the appropriate use of agricultural robots. Agricultural scientists, farmers, and growers also face the consequences of growing more yield on less land in a justifiable manner to reach the demand of the population. The blend of digital tools, sensors and control technologies has advanced the design and development of agricultural robots, exhibiting the important advantages of present-time agriculture.

A. PROJECT OBJECTIVES
Module is built to perform three main functions, such as detecting the color of ripe fruits or planted vegetables, finishing, and determining the corresponding compartment in which the container will be placed. Design a machine that is effortless and is a compatible user interface to perform the required operations. Reduce malfunction, minimal labor input, and manual maintenance costs. An easy-to-use mobile app that controls the machine to run the way you want it.

B. LITERATURE VIEWS
The purpose of the document is to design an agricultural robot, which is beneficial to people in carry out operations such as digging, planting, spraying pesticides, mowing and plowing, and detecting obstacles.

The goal of this work is to design, develop, and manufacture Agribot, a multifunctional robot that can perform all agricultural operations, including plowing, planting seeds in the plowed area, and using a leveler to keep the field flat. , Irrigate crops, fertilize and control agricultural robots through cameras.

The project objective is to automatize the system that not only minimize labor costs, but also minimize the operation time for excavation and seeding. Solar energy is used to charge batteries, which are used as power sources for DC parallel motors, Arduino and other components.

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II. PROBLEM STATEMENT

Currently, people are migrating to urban areas, so the lack of labor for agricultural activities is a major problem. Because labor requires more time to perform specific activities. This may not be accurate to the expected level. To overcome these problems, the agricultural robot is designed to automatically perform multiple activities without human intervention, so it can complete precise tasks in less time than humans.

III. PROPOSED STATEMENT

The robot can plow fruits and vegetables with the help of color sensors and robot plows, and the sorter is also very easy. It takes less time, and there is no error handling of the product.

Working: Improve the harvesting process of fruits and vegetables according to the form of products. In the process of collection and placement, the robot moves and corrects the position of matured fruits and vegetables. The work process begins according to the instructions provided, backward, to the right, is left and stopped. The engine driving device 2 is used for the movement of the arm and the cutting operation. The motor driving device 3 is used to place aged fruits and vegetables in a specific partition. . The color sensors are used to detect if fruits and vegetables are fresh or mature depending on the color. The cutting action is initiated and the blade is connected to the end and arm. Depending on the color, the tray has two partitions. When the vegetables and fruits are shipped from the plant with the help of the bladder, it is placed directly on the respective compartments with the support of the tray.

BLOCK DIAGRAM

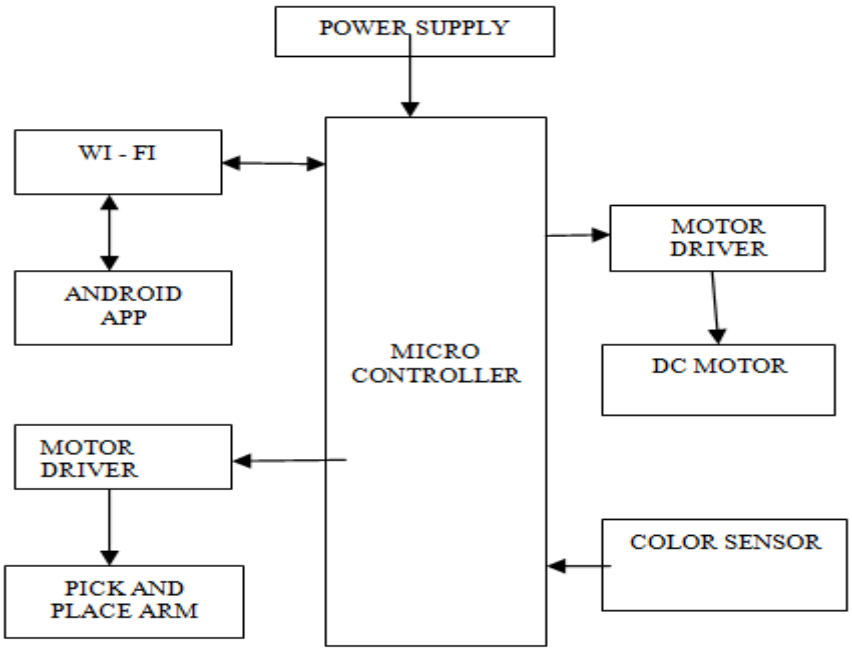

Fig : Architecture of system

Hardware Requirements:

- Arduino
- Power supply
- WiFi module
- Motor drivers
- DC Motors
- Color sensor

Software Components:

- Terminal
- Arduino IDE
- Embedded C

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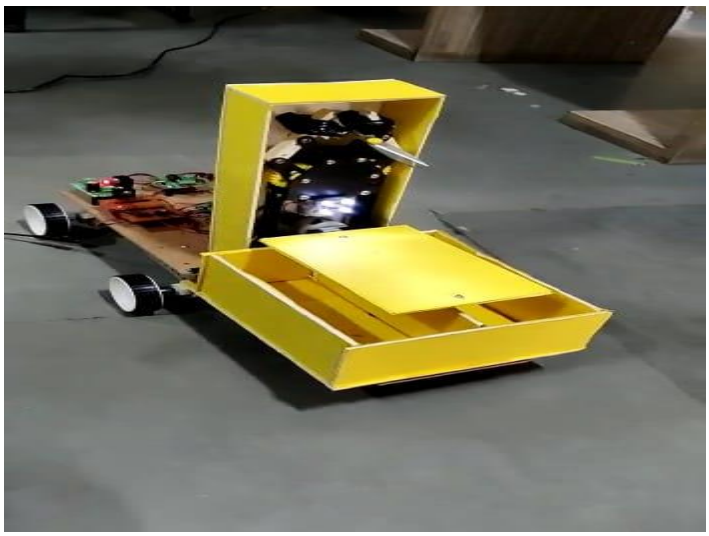
IV. FUTURE SCOPE

Agricultural field robots play an important role. In the future, on a fully automated farm, robots can perform tasks such as fertilization, pests and monitoring of diseases, collection and cultivation. By increasing the correct size and the size of the robot, we can easily choose the fruits, we can reduce human power. This allows you to monitor without operating when monitoring robot .The power of saved persons can be used for other purposes in the agricultural field.

V. RESULT

Do some activities, such as recognizing the vegetables based on their color, then picking up the vegetables with the help of the blades provided on the robot arm, and placing the vegetables and fruits in the corresponding compartments of the tray. The features of the Android platform are of great help to farmers. Depending on the color, there are two compartments on the tray. Once the vegetables or fruits are removed from the plants with the help of the knives, they are placed directly on the corresponding compartments with supports for trays. Smart Farm Bot provides farmers with a elastic UI to effectively administrate the machine. It decreases the need for worker, which is beneficial for farmers, because finding workers is a burden. Compared to performing the same activity manually, the time required to perform the function is greatly reduced.



ADVANTAGES:

- They are small in size.
- Save time and waste resources.
- Useful in continuous agriculture for farmers who cannot provide large-scale machines, paying labor to work on other land as labor.

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APPLICATIONS:

- Can be used to manage farmland.
- Can be used for domestic purposes.
- Can be used to stimulate interest in learning about agriculture between generations and communities.

VI. CONCLUSION

In this project, efforts are made to design smart agricultural robots. Do some activities, such as recognizing the vegetables based on their color, then picking up the vegetables with the help of the blades provided on the robot arm, and placing the vegetables and fruits in the corresponding compartments of the tray. Compared with traditional agricultural robots, it uses color sensors to detect the color of fruits or vegetables. Smart Farm Bot uses the functions of the Android platform to significantly help farmers. In this project, the ESP8266 module is used to provide control signals to the Arduino UNO. Seven motors and three motor controllers are used here. Among the three motor controllers, two are the L293D high-power motor controller for wheel motion control and the other is the low-power L293D motor controller for pallet control. In addition, it also contains a rechargeable battery. color sensor, the cutting action is initiated. Blades are connected to the extreme end of the arm. There are two compartments provided in the tray depending on color. Once the vegetable or fruit is dispatched from the plant with the help of the blades, is placed directly on the respective compartment with support of tray. Smart Farm Bot provides a elastic UI to farmer to manage the machine successfully. It decreases the requirement of labour which is a add on advantage to the farmers. The duration required to complete the functionalities decreases comparatively with carrying out the same activities manually. The Smart Farm Bot can perform in any type of climatic condition as well as can work nonstop. It is a profitable investment that decreases the overall farming cost. Smart Farm Bot acts as a hub to automize smart farming.

REFERENCES

1. Akshay Y. Kachor, Ketaki Ghodinde 2019 , “Design of microcontroller based agribot for fertigation and plantation” Proceedings of the International Conference on Intelligent Computing and Control Systems (ICICCS 2019) IEEE Xplore Part Number: CFP19K34ART; ISBN: 978-1-5386-8113-8.
2. Ankit Singh, Abhishek Gupta, Akash Bhosale, Sumeet Poddar 2015, “Agribot: An Agriculture Robot” International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 1, January.
3. B S Balaji, Shivakumara M C, Sunil Y S, Yamuna A S, Shruthi M “Smart Phone Operated Multipurpose Agricultural Robot” in IJERT pp478-481.
4. Farha Rafath, Syeda Zaara Ahmed, Juveria 2020 , “Obstacle Detecting Multifunctional AGRIBOT Driven by Solar Power” Proceedings of the Fourth International Conference on Trends in Electronics and Informatics (ICOEI 2020) IEEE Xplore Part Number: CFP20J32-ART; ISBN: 978-1-7281-5518-0.
5. Gulam Amer, S.M.M.Mudassir, M.A Malik 2015, “Design and Operation of Wi-Fi Agribot Integrated System” International Conference on Industrial Instrumentation and Control (ICIC) College of Engineering Pune, India. May 2830, 2015.
6. H. Pota, R. Eaton, J. Katapriya and S. D. Pathirana, 2007, “Agricultural robotics: streamlined approach to realization autonomous farming,” in IEEE conference on industrial and information systems, pp. 85-90.
7. J. Raja and W. Stanley Karunakaran, “Automatic ploughing and Seeding Robot” in IOSR Journal e-ISSN pp 68-73.
8. N.S. Naik, V.V. Shete and S.R. Danve, 2016, “Precision agriculture robot for seeding function,” in IEEE International conference on inventive computation technologies (ICICT), pp. 1-3.
9. S. Umarkar and A. Karwankar, 2016, “Automated Seed Sowing Agribot using Arduino," in IEEE Conference on Communication and Signal Processing, April pp.1379-1383.
10. Santhosh Kumar S, Anusha M, Mohammed Junaid 2018, “IoT Based Agriculture Using AGRIBOT” 3rd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT-2018), MAY 18th & 19th 2018.

11. Shreyash Kulkarni, Rahul Kumbhar, Krunal Mistry, Shravan Nithurkar 2019 , "Multipurpose Agribot" IOSR Journal of Engineering (IOSRJEN) ISSN (e): 22503021, ISSN (p): 22788719 Vol. 09, Issue 4 (April. 2019), ||S (III) || PP 32-37.
12. Siddharth Gupta, Rushikesh Devsani, Shraddha Katkar, Rutuja Ingale 2020. "IoT Based Multipurpose Agribot with Field Monitoring System" 2020 International Conference on Industry 4.0 Technology (I4Tech) Vishwakarma Institute of Technology, Pune, India. Feb 13-15,
13. Suraj Chavan, Anilkumar Dongare, Pooja Arabale, Usha suryanwanshi, Sheetal Nirve 2017, "Agriculture Based Robot (AGRIBOT)" Vol-3 Issue-1 IJARIIE-ISSN(O)23954396.
14. Y Nikhil Kumar, Ch Haswanth, M Hima Kiran 2019 , "Automated Seed Sowing Agribot Proceedings of the International Conference on Intelligent Computing and Control Systems (ICICCS 2019) IEEE Xplore Part Number: CFP19K34-ART; ISBN: 9781-7281-0419-5.