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Multifunctional Agri Robot Operated Through Smart Phone

Ravi Kumar K N [a], *Swaroop N S* [b]

[a,b]*Assistant Professor, G Madegowda Institute of Technology, Bharathinagara, K M Doddi, Mandya and 571422, Karnataka, India*

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A B S T R A C T

Based primarily on material produced in recent years, this report presents an overview of the global evolution and current state of precision-agriculture technologies. Natural resource variability, variability management, management zone, the impact of precision agriculture technologies on farm profitability and the environment in engineering innovations, information management, the global trend of precision agriculture technology adoption and application, and the technologies' potential to modernize agriculture globally are some of the topics covered. A synopsis of farm vehicle guidance technology research is provided. The future development of agricultural vehicles will be enhanced by the use of new, widely accepted robotic technology. The logical extension of automation technology into biosystems like horticulture, forestry, green houses, and agriculture is known as agricultural robotics. .their uses. Among the contributions made by scientists are the mobile, flying, forester, and Demeter robots, which are only utilized in agriculture. The kinds of robots that improve agricultural precision and accuracy are being briefly discussed.

Keywords: Agricultural vehicle, AgriRobot, Smartphone

1. Introduction

Traditional seed-planting techniques in India often involve the use of tractor-driven drilling or animal-drawn funnel pipes. Nowadays, speed, energy economy, sensors for precise guiding, and enabling technologies like GPS and wireless connection are the main focus of the development of autonomous field robots. The earlier method is labor-intensive and takes a lot of time and energy. In contrast, operators of such power units in tractor-based drilling are subjected to high levels of vibration and noise, which are harmful to their health and productivity. Technology was not as advanced in the past. They were therefore hand-seeding. However, technology has advanced in recent years. Given the realities of the Indian farming sector, the system that is built must be more cost-effective, operate more accurately, use less fuel, and involve less physical effort from humans than tractors and traditional methods. Farmers will truly benefit from the final product if these problems and factors are appropriately addressed. Using robotics technology in agriculture is a relatively new concept. The potential for robot-enhanced productivity in agriculture is enormous, and more and more robots are showing up on farms in a variety of forms.Since the potential to replace human operators offers practical solutions with a return on investment, the applications of instrumental robots are expanding daily to include additional domains. As a result, we suggest an agricultural automation system that might assist farmers in exerting less effort.

When designing a robot to automate these tasks, the seeding process requires that the robot be able to move straight ahead on uneven farm field roads, that the soil's moisture content may impact the soil digging function, and that the sensors used in the system be chosen with the effects of farming environments on their operation in mind. In addition to these, the task requires accuracy in the following areas: digging depth, the ideal spacing between rows and plants for a certain crop type, the number of rows that must be sown at a time, and precise field navigation. Other procedures, such as weeding and spraying, rely on the seeding stage and the precise placement of the crop to perform those activities appropriately. The current state of the farmer in a given area is a significant factor in the construction of the robotic system or the vehicle's physical components. An agribot is a robot made specifically for farming. It is intended to increase the speed and accuracy of the work while also reducing the amount of labor required of farmers. It does the basic tasks of farming, such as plow the field, plant seeds, cover the seeds with dirt, and sprinkle water on them. The foundation of the Indian economy is agriculture. The fact that 50% of the population works in agriculture is evident from the leaves of the plants. The majority of nations currently lack enough trained labor, particularly in the agricultural sector, which hinders the development of developing nations. In order to solve this issue, it is time to automate the industry. Our project's creative idea is to automate the process of planting vegetables like pumpkin, beans, lady fingers, and pulses like black and green grams, as well as crops like sunflower, baby corn, groundnuts, and cotton, in order to decrease human labor and boost productivity.

2. Methodology

Blynk was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things. There are three major components in the platform. • Blynk App - allows to create amazing interfaces for your projects using various widgets we provide. • Blynk Server - responsible for all the communications between the Smartphone and hardware. We can use our Blynk Cloud or run private Blynk server locally. Its open-source could easily handle thousands of devices and can even be launched on a Raspberry Pi. • Blynk Libraries - for all the popular hardware platforms - enable communication with the server and process all the incoming and out coming commands as shown in Fig. 1.

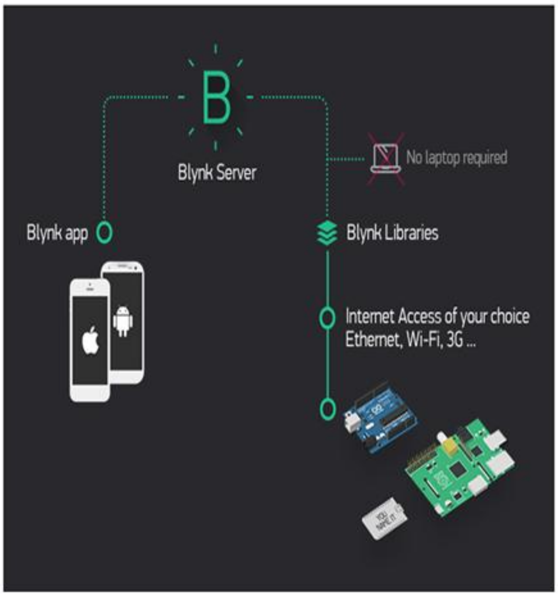

Fig. 1: Smart phone

Improvements in horticulture are necessary for the task. Here, we use remote association to make AGROBOT function. It is powered by a 12V force supply. Sensors that detect temperature and moisture content are necessary for harvest development and soil ripeness. The microcontroller functions after receiving information from the worker. There are engines connected to the pesticide and water sprinkler systems. The ability to cope with less manual labor and the prevention of disease transmission is the greatest advantage. It is a very safe method that allows crops to grow without requiring manual labor. A microprocessor is used to control the engines, sprinkler, and seed sower. As illustrated in Fig. 2, ESP8266 is used to send and receive sensor data and meanderer development instructions independently. It is linked to cloud-based versatility. A variety of heavy material handling procedures are carried out in the agricultural sector. For instance, during the harvest season, workers in vegetable cultivation need handle heavy vegetables. Additionally, during the fertilizing season, employees in the rapidly growing field of organic farming need handle bulky compost sacks. These tasks are tedious, repetitious, or call for workers to possess strength and competence. The orchard fruit harvesting system was created by Kawamura and associates. The apple harvesting robot was built by Grand and colleagues. Numerous other works have come after them. Numerous works record the fulfillment of the fundamental activities in real-world open areas and concentrate on the structure systems design (mechanical systems design, for example) of the robot. Many of the robots, however, are still in the research and development stages rather than the distribution stages. Finding spaces to improve robot performance and reduce costs is crucial.

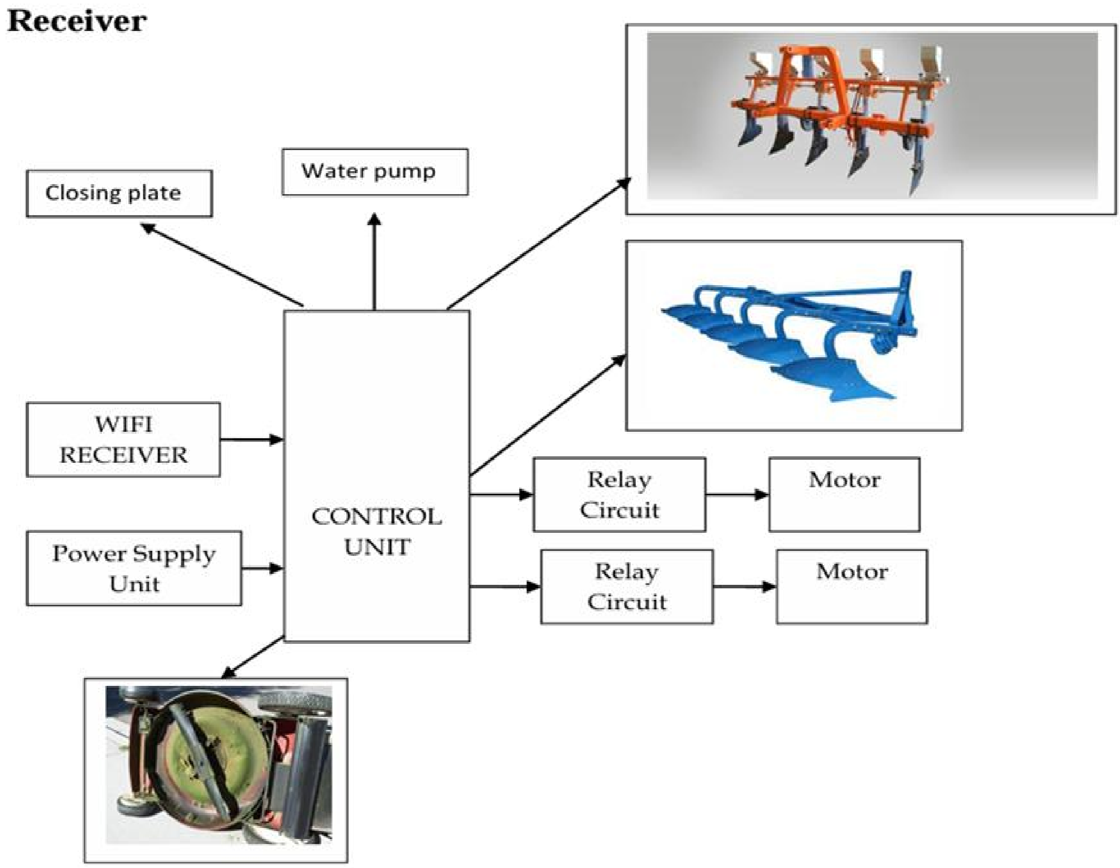

Fig. 2: Block diagram of Receiver

3. Construction of references Interfacing Geared DC motor to ATMEGA 32

ATMEGA32 controls Geared DC motor using L298 Chip. The L298 is a high current dual full-bridge driver created to accept standard TTL logic levels and drive inductive loads such as solenoids, relays, stepping and DC motors. Fast Recovery Diodes are used to suppress electrical noise generated by Electric DC Motor. Figure 3 shows Bidirectional DC motor connected to L298 Chip.

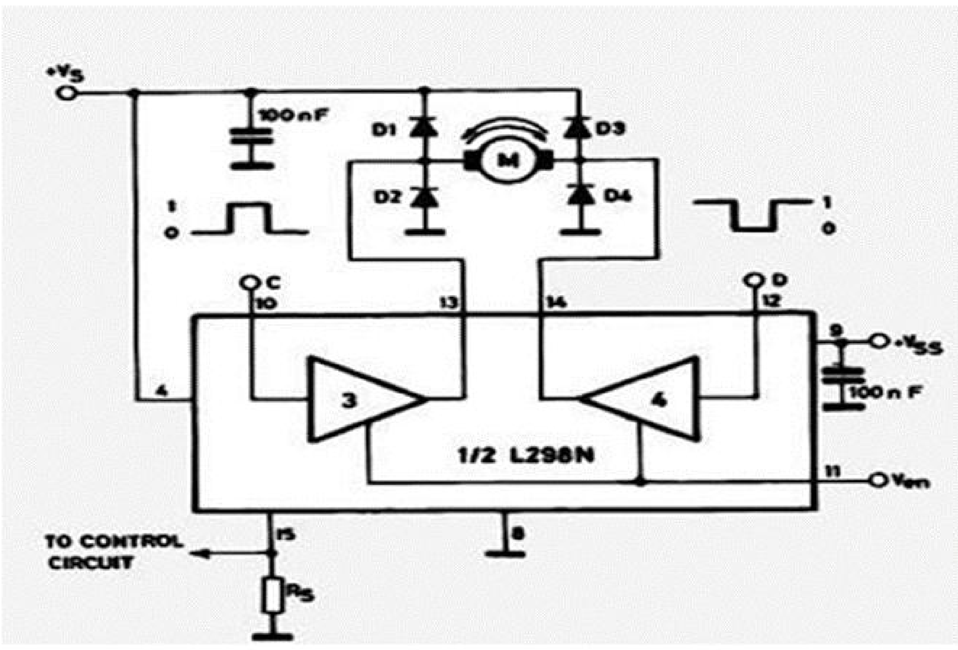

Fig.3:.Bidirectional DC motor connected to L298 Chip.

4. Results

The hardware components are successfully interfaced with the microcontroller. Test results shows that the various field activities like ploughing, sowing seeds, irrigation, obstacle detection and obstacle clearance are performed and controlled with the help of WiFi module. The results that have been produced from the improved agricultural robot are the following: increased biodiversity, increased productivity, and increased profits. Improved agricultural robot aim to produce food for consumers that are safe and wholesome.

5. Conclusion

In agriculture, the opportunities for robot-enhanced productivity are immense – and the robots are appearing on farms in various guises and in increasing numbers. The other problems associated with autonomous farm equipment can probably be overcome with technology. This equipment may be in our future, but there are important reasons for thinking that it may not be just replacing the human driver with a computer. It may mean a rethinking of how crop production is done. Crop production may be done better and cheaper with a swarm of small machines than with a few large ones.

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