A Smart Vehicle for Farming Task

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ABSTRACT

The primary goal of the project is to develop agricultural equipment that enables farmers to plant seeds and apply pesticides without human interference. One of the biggest issues facing the farm sector is the overuse of pesticides in fields, which pollutes waterways and has many negative effects. The vehicle facilitates the laborious operation of planting seeds in the fields. We plan to implement pesticide splashing and the Flywheel-Based Seed Sowing Framework. A state-of-the-art Arduino control system operates the system. The client has access to all of the vehicle's capabilities via an improved Arduino that is Bluetooth-enabled to an Android application.
A tank for storing the seeds is included with the seed-sowing mechanism. The Seed Sower approach is achieved by a very straightforward and easy approach.

Keywords: *Arduino Uno, DC Motors, Bluetooth Module, Servomotor, Water Pump, and Motor Driver*

1. Introduction

Although a lot of work has been done in this area, agriculture is one of the main occupations in India**, so it is** crucial to find and 7use new ideas in this industry. Regrettably, these concepts have not been appropriately applied in the real world. This is because it is expensive and difficult for those living in remote areas. This equipment is fundamental and essential to agriculture in order to maximize yields. A smart vehicle for agricultural task equipment is being designed in such a way that it may be obtained at a low cost and with high durability in order to address the labor shortage that causes agriculture to be delayed.

1.1 Existing System

Manual seeding is the traditional way, although there are a number of issues with this practice. Traditional methods rely on human strength and antiquated methods; they take more time and effort. Because humans need to rest, they might not be able to work in dangerous conditions. Additionally, muddy dirt may compact, therefore, large wheels are necessary. We need skilled laborers in agriculture. By automating the soil-loosening and seed-planting processes, the need for human labor can be met. Thus, the traditional system has several issues

1.2 Proposed System

The suggested approach includes a technology that allows for quick soil loosening, seeding, and robot motion in autonomous mode. This RF module is used to move the robot forward, backward, left, and right in manual mode. The system's power supply is provided by the 12V battery. The motor drivers are controlled by the Arduino Uno. Robotic applications make use of DC motors. Here, two motors can be controlled by an L293D driver. Two motors are controlled by the L293D motor driver in both directions. The motor is driven from the left and turns right by the motors on the left and right sides. The mechanical apparatus for seeding and loosening the soil.

2. TECHNOLOGY USED

2.1. Arduino Uno: The core of the system is the Arduino Uno, which is coupled to all the sensors and other hardware components needed to accomplish the desired task. Based on the ATmega328, the Arduino Uno is a compact, feature-rich, and breadboard-friendly board. The bootloader uses 2 KB of the 32 KB of flash memory that the ATmega368 possesses for code storage. Two KB of SRAM and one KB of EEPROM are features of the ATmega368. The controller is readily available and reasonably priced. The Arduino Integrated Development Environment (IDE) is used to write any software code. Writing code and uploading it to the Arduino board is made simple by the open-source Arduino IDE software. It is compatible with Linux, Mac OS X, and Windows. Programming interrupts are used to increase system efficiency and adapt to changes.

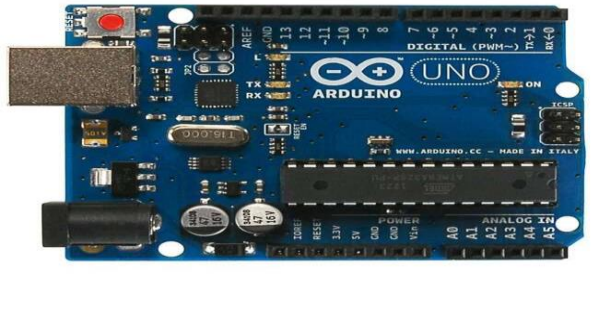

Fig. -1: **Arduino Uno**

2.2 Arduino IDE software

An integrated development environment is referred to as an IDE. It's a computer application that includes all of the tools programmers need to create software. An integrated development environment (IDE) often includes a source code editor, compiler, builder, and debugger. IDEs are preferred by programmers over traditional text editors because they make writing code easier. Visual Studio Express, Eclipse, and NetBeans are a few examples of IDEs. Each IDE offers special features, advantages, and disadvantages of its own. Some IDEs support only one programming language, while others support multiple languages. They also vary according to the type of software development, such as desktop, web, and mobile.

3. SYSTEM ARCHITECTURE

The system architecture provides a general understanding of the project and explains how the various components of the system are interconnected and carry out their respective tasks. The primary technology utilized in this project is the Arduino Uno. There is a 12V power source that is transformed to 3.3V by passing it through a regulator and supplied to the Arduino Uno. The Arduino device, which interfaces with the L293D motor driver IC, receives the input as embedded "C" code, and the motor receives the output. The robot is moved by the motors attached to its wheels, completing the seed-planting operation.

3.1 Block Diagram

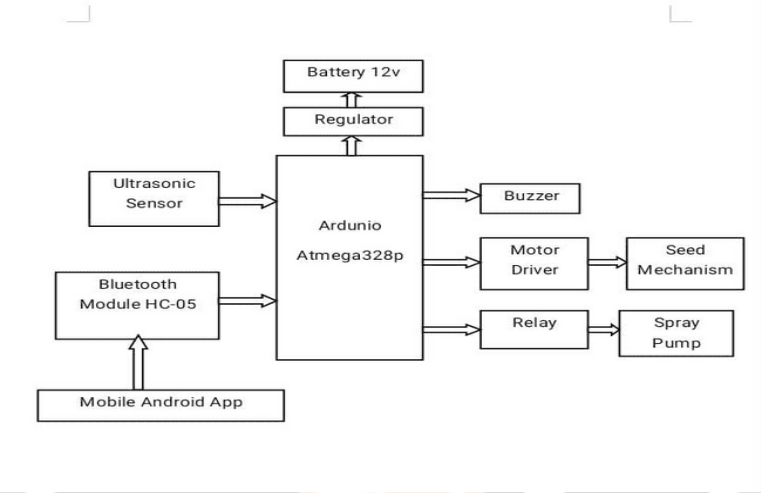

Fig. -2: Block Diagram

4. CONCLUSIONS

Smart agricultural vehicles for seed sowing and pesticide spraying represent a significant leap in modern farming techniques. As the agricultural business evolves, smart technologies will play an increasingly important role in supporting sustainable farming methods. Overall, the project to produce smart agricultural vehicles for seed planting and pesticide spraying is a forward-thinking endeavor that coincides with the future of agriculture, encouraging innovation and resilience.

5. REFERENCES

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