



Solar Powered Mobile Operated Smart Multifunction Agriculture Robot

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Abstract : *Many advances in technology have made the agriculture business a much less labor intensive industry to be a part of. If we think back even only 50 years, farmers were just beginning to incorporate technologies into their farming techniques. It has been said that individuals that are involved in the farming industry are some of the least susceptible to change. They are very set in the ways of those came before them. When we take a look at the farming industry now, we can see that this is rapidly changing. Farmers are looking for new ways to implement technology to cut costs and reduce labor hours.*

One of the ways that farmers are beginning to explore new technologies in farming come from the autonomous Tractor (robot). The battery powered Mobile operated wireless agribot is something that is very new to the agriculture industry, but is quickly gaining popularity from agriculture research companies around the United States. These agribot are described by Farm Industry News as a tractor that drives its solve with a computer in control. Although still in the research phase of development, autonomous robot are rapidly becoming more of a reality than an idea. One of the ways that farmers are beginning to explore new technologies in farming come from the autonomous Tractor (robot). The battery powered Mobile operated wireless agribot is something that is very new to the agriculture industry, but is quickly gaining popularity from agriculture research companies around the United States. These agribot are described by Farm Industry News as a tractor that drives its solve with a computer in control. Although still in the research phase of development, autonomous robot are rapidly becoming more of a reality than an idea.

Keywords – Agribot, Ploughing , Seeding , Solar Panel, Arduino Uno, Battery,

I. INTRODUCTION

The autonomous farming tractor is something that is very new to the agriculture industry, but is quickly gaining popularity from agriculture research. This autonomous mechanical function tractor rapidly becoming more of a reality than an idea. When the tractor is moving on a surface, it is controlled by a Bluetooth technology. This can be moved forward and reverse direction using geared motors. The tractor can move towards left and right directions using these geared motors. This project uses AT89S52 Microcontroller and comprises of performing Soil ploughing , seeding , watering, pesticide spraying with Bluetooth decoder commands. whole system is powered through Solar Panel.

Bluetooth is used which converts the desired frequency in to analog signals which is Bluetooth by Bluetooth Decoder and given to AT89S52 microcontroller. The microcontroller is used for controlling the tractor according to the frequency received by the Bluetooth receiver. To control the devices from remote place we are using a Bluetooth technique. Connect a mobile at the receiver end (Controller side which is fabricated on robot). If we

give a command from another mobile automatically it gets received by the Bluetooth decoder unit placed on receiver end.

When the Mini Tractor (Robot) is moving on a surface, it is controlled by a Bluetooth technology based Mobile remote. This can be moved forward and reverse direction using geared motors. Also this tractor can take sharp turnings towards left and right directions. Soil Ploughing operation is done by DC high torque geared motor arrangement. Seed sowing operation is done by DC geared motor mechanism. Water sprinkler and pesticide sprayer added advantages in it. This project uses controller board to control all the operation.

II. AIM & OBJECTIVE

As we all know the main requirement in the agriculture industry is man power. So the main objective of our project is to reduce the need of man power.

The agriculture sector is the one where not only number of labours is required but also they must have the required skill set for farming. Need of labours can be accomplish by automating the process of seed sowing, ploughing and water spraying by using solar panel.

The “Seed plantation and ploughing” is one of the most important and day-to-day job of the farmers. Conventional method suffers from various problems. The main aim of our project is to reduce the human effort, time requirement and to increased accuracy of this Solar operated Smart Agriculture Tractor (Robot) project.

III. METHODOLOGY

The methodological procedure, circuit diagram and the block diagram are included in this section. The development of the agricultural robot consists of the integration of hardware techniques and software tools. Arduino Uno microcontroller is the master controller of the developed robot. All the operations of the robot are controlled through Bluetooth connectivity. The robot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone and the robot. The Bluetooth electronics app is used to control each and every operation of the robot. The Bluetooth HC-05 module is fixed on to the robot which receives signals from the Bluetooth electronics app and sends these signals to the microcontroller for processing of operations.

The microcontroller is powered by a 12V DC battery and it consists of a voltage regulator, which is used to regulate the voltage input for the controller. The microcontroller gives a 5V supply to the driver circuit. This supply is insufficient to actuate DC motors. Thus driver circuit amplifies 5V current into 12V current and drives the motors connected to it.

The L293D motor driver 1 circuit is used to control the bidirectional motion and receives signals from the microcontroller. The DC motors control wheel motion and other activities of the robot. The microcontroller sends signals like 00,01,10,11. When signals are like 00 or 11 then the motor is in off condition so there is no movement of robot occur, if else the signal like 01 then the motor will rotate on backward direction else the motor rotate on forward direction (when signal is 10).

The L293D motor driver 2 circuit which controls two Dc motors. One DC motor is used for line marker and another one is used for seed dispenser. A line marker is used to mark a line along which seeds are dispensed. The marker has a single teeth and only one line is marked along the path of the robot. The depth through which the mark is done can be controlled through the Smartphone.

IV. FIGURES AND TABLES

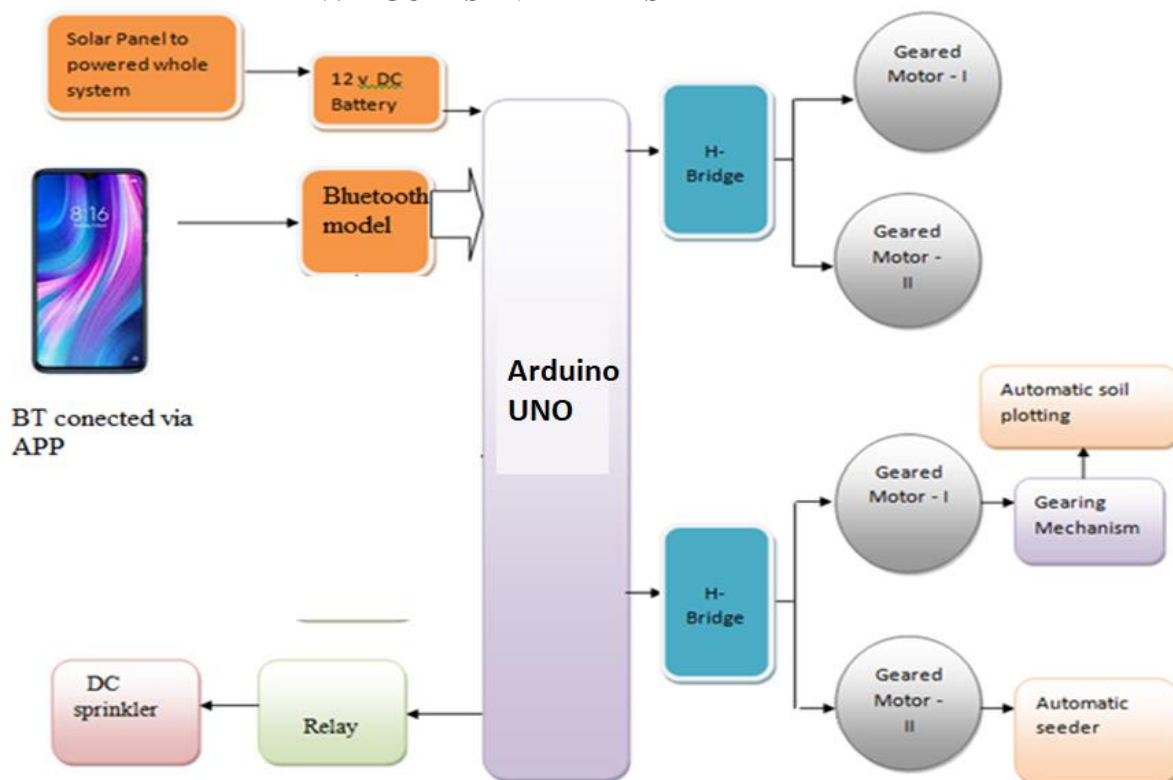


Fig 1 Block Diagram of Solar Powered Mobile Operated Smart Multifunction Agriculture Robot

V. CONCLUSION

This project presents the Implementation of farmer friendly battery powered mobile operated agricultural robot with automatic soil ploughing, seed sowing, watering and pesticides sprinkler arrangement using Bluetooth. It has been designed and implemented with Atmel 89S52 MCU in mechanical system domain. Experimental work has been carried out carefully. The result shows that higher efficiency is indeed achieved using the mechanical system according to requirement of the user.

The robot for agricultural purpose an robot is a concept for the near the performance and cost of the product once optimized, will prove to be work through in the agricultural spraying operations. We have been successful in developing a robot whose construction is enough to withstand the challenges of the field. We are sure that once this concept is presented in a manner suitable to Indian market, it will differently help in bringing down the 15% molality rate found in the Indian formers associated with the agricultural spraying operation.

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