MAAR: Multipurpose Autonomous Agricultural Robot

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ABSTRAT: In Modern World, Automation robot is used in many of the fields such as defence, surveillance, medical field, industries, agricultural and so on. In this project, the robot system is used to develop the agricultural processes without the use of manpower. The aim of our proposed system is to reduce manpower, time, and increase the productivity rate. It provides manual control and keeps a track on the humidity with the help of humidity sensors. The main component of our proposed system is the Advanced Virtual RISC (AVR) at mega microcontroller that supervises the entire process. For manual control the robot uses the wi-fi connection application as control device and helps in the navigation of the robot inside the field. Solar panel is used for power supply to the robot. This is especially important for the safety and health of the workers. Automation is the ideal solution to overcome all the shortcomings by creating machines that perform all operations and automating it to increase yield on a large scale.

TECHNICAL KEYWORDS: Agricultural robot, Arduino, Robot Architecture, Agricultural Functions, Hygrometer

INRODUCTION: Main motive of Automation Technology is to reducing the effort of labour, a phenomenon common in the developed world. The reasons are the need for improved the process of farmer working. Robotics and artificial intelligence achievements offer solutions in precision agriculture to processes related to seeding, harvesting, weed control, grove supervision, chemical applications, etc. to improve productivity and efficiency. The applications of instrumental robotics are spreading every day to cover further domains, as the opportunity of replacing human operators provides effective solutions with return on investment. All kinds of agricultural robots have been researched and developed to implement a number of agricultural products in many countries. This Agribot can performs basic elementary functions like harvesting, planting and spray the pesticides. The application of agricultural machinery in precision agriculture has experienced an increase in investment and research due to the use of robotics applications in the machinery design and task executions. Precision autonomous farming is the operation, guidance, and control of autonomous machines to carry out agricultural tasks. It motivates agricultural robotics. The goal of agricultural robotics is more than just the application of robotics technologies to agriculture. The multipurpose agricultural robots are designed to perform the basic functions required to be carried out in farms. These robots are used for agricultural operations perform autonomously such as ploughing, seed sowing, mud closing and water spraying. The objectives of the proposed system are to dig the soil depending on moisture level in the soil, to plough the seeds with teeth's like structure at the end to turn the top layer of soil down, to close the seeds and level the ground automatically and to provide irrigation system by spraying water with a pump in the field.

METHODOLOGY: The movement of robot is based on Bluetooth commands from an android phone. The android phone sends commands such as move forward, backward, right, left and stop for the movement of robot. The robot then follows the commands. Once it reaches the point where the process needs to be started it starts ploughing at that point using a heavy drill motor which has a drill bit connected using a chuck. Once the ploughing process is over it stops the motor and then a seed is thrown out of the seed container by opening the lid of seed container using a servo motor. The servo motor then comes back to its original position and the lid is now closed. After this the soil moisture sensor checks the moisture content of the soil and if water is needed then it starts watering using a pump motor. Once all these actions are completed then the robot waits for the next movement command from the user. When the water in the water container reaches beyond the threshold level then the water sensor sends a low water indication to the app. The temperature sensor is used in order to check the ambient temperature for crop growth. Only Watering: This mode of action is used when the user only wants to water the crops. Here also the movement of the robot depends on the commands from the android phone. Once the robot reaches the desired location soil moisture

sensor is activated. It senses the moisture content of soil and if water is needed then it starts watering using a pump motor. Once all these actions are completed then the robot waits for the next movement command from the user. When the water in the water container reaches beyond the threshold level then the water sensor sends a low water indication to the app. The temperature sensor is used in order to check the ambient temperature for crop growth.

HARDWARE MODEL:

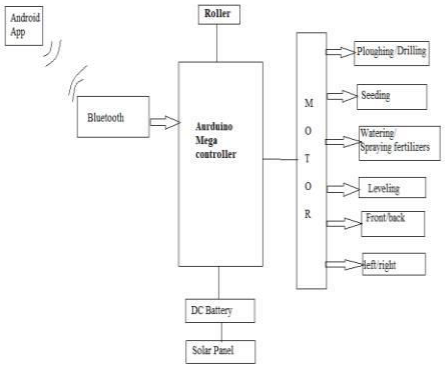

Fig 1. Hardware model

LITERATURE SURVEY:

Sr. no	Paper Name	Author Name	Conclusion
1	IOT based monitoring system in smart agriculture	Pratibha s r, Anupama Hongal	It reduces Human Power. Wireless working is take place.
2	AGRIBOT: A multipurpose agricultural robot	Akhila Gollakota, 2014	AGRIBOT is good for ploughing operation.
3	Smart phone Operated multipurpose agricultural robot	B. S. Balaji	These are the small machines that may be more acceptable to the non-farm community.
4	Agricultural robot for automatic ploughing and seeding	Mrs. R. Praveena 2015	Robot capable of performing operations like automatic ploughing, seed dispensing, fruit picking and pesticide spraying

CONCLUSION: In this work a robot, named, Agri robot, has been carried out as an undergraduate research project. Proposed robot will assist the farmers in improving the efficiency of operations in their farms. Various functions like ploughing, seeding, levelling, watering or spraying fertilizers with the help of android app connection with Bluetooth. In this work, sensors were used for testing of soil moisture and water level.

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