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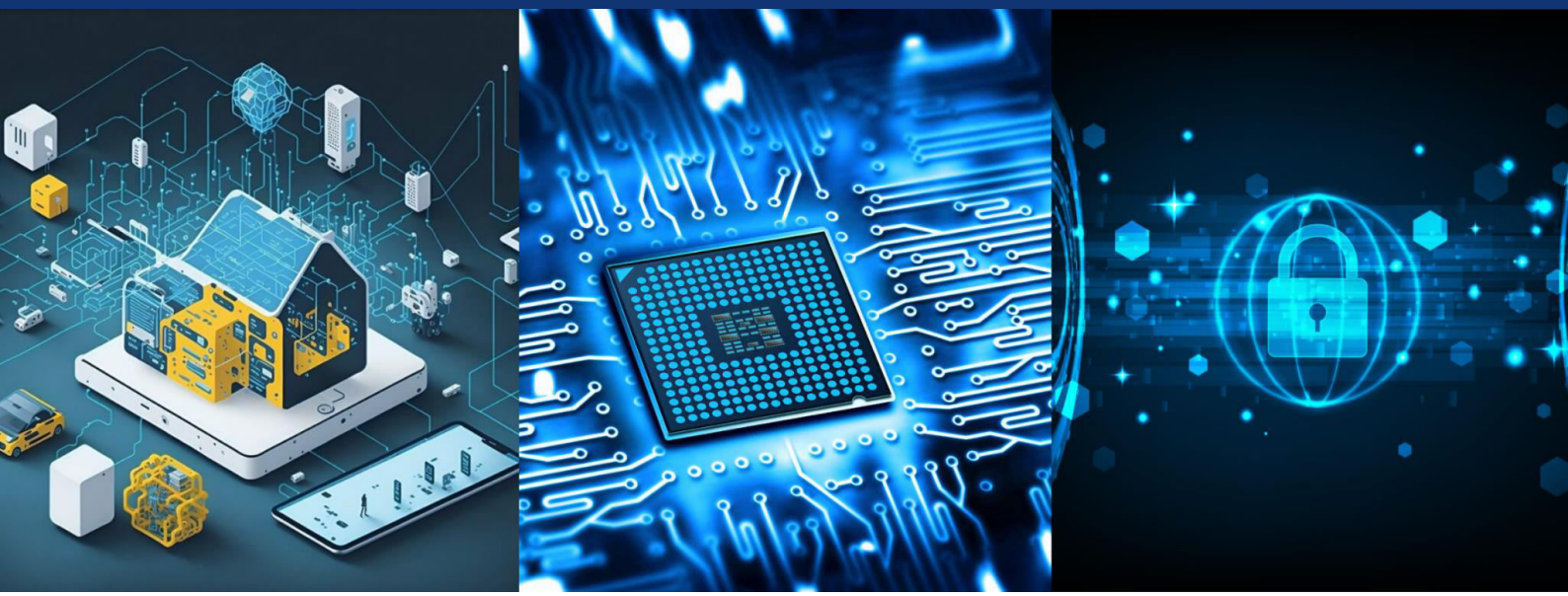

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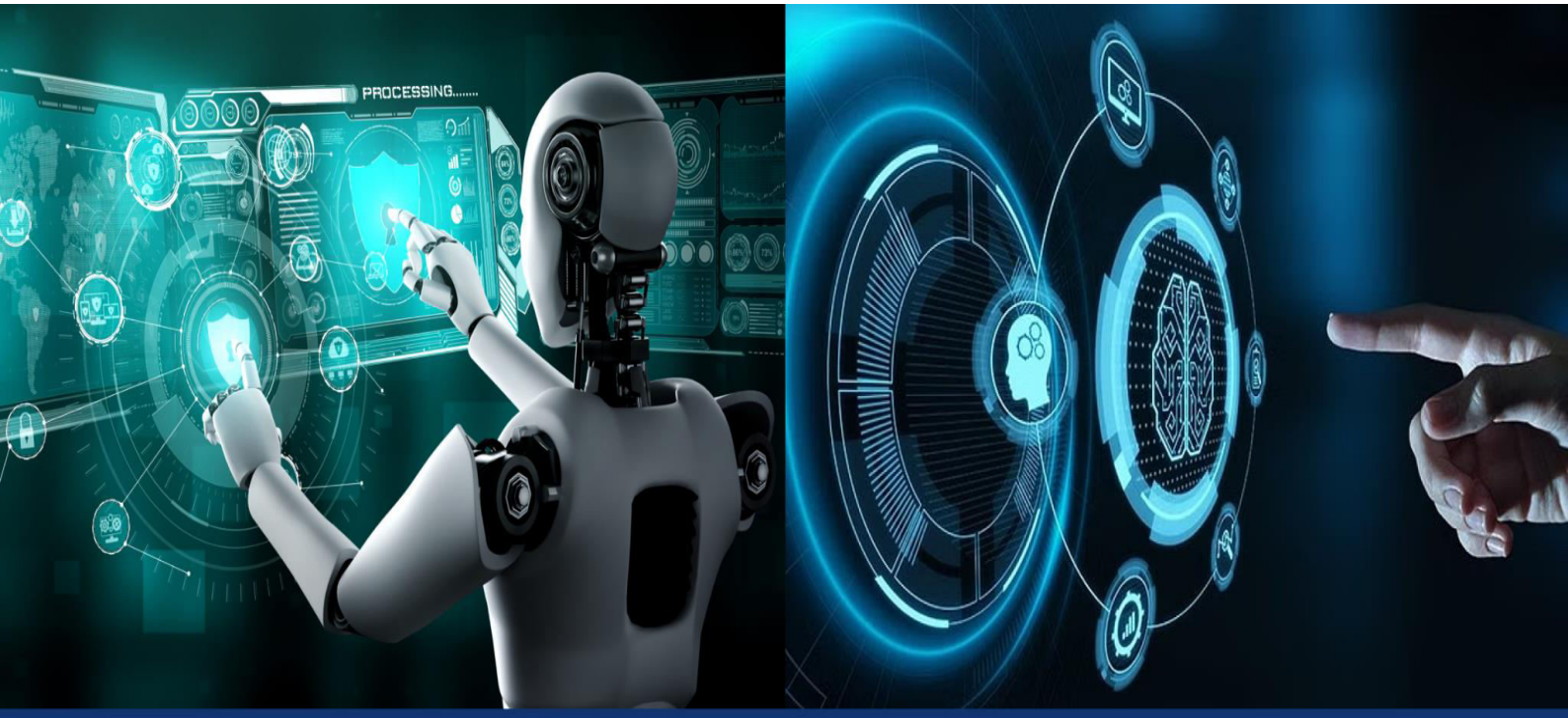

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Smart Phone Operator Multipurpose Agricultural Robotic Vehicle

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ABSTRACT: Robotic vehicle is an agricultural machine with great soil clearing capacity. Mechanical vehicle is an agrarian machine with incredible soil clearing limit. This multipurpose framework gives a development technique for sow, furrow, watering and cut the harvests with least labor and work making it a productive robo vehicle. The machine will develop the homestead by considering specific lines and explicit segment at fixed distance contingent upon crop. Planning of farming robot which depends on electronic and mechanical stage to perform advance agrarian interaction. It is utilized to build up a robot equipped for performing activity like programmed furrowing and seed administering. This task constrained by far off. It is utilized to charge utilizing DC battery. The entire interaction of cultivating, watering and cutting the harvest utilizing the figuring, handling, checking are planned utilizing engines and parts interfaced with ATmegamicrocontroller.

KEYWORDS: Robotics and Automation, Internet Of Things, Atmegamicrocontroller, sensors.

I. INTRODUCTION

Advanced mechanics is an interdisciplinary exploration zone at the interface of software engineering and designing. Advanced mechanics includes plan, development, activity, and utilization of robots. The objective of advanced mechanics is to plan smart machines that can help and help people in their everyday ACTIVITIES and protect everybody. Mechanical technology creates machines that can for people and duplicate human activities. Robots can be utilized much of the time and for some reasons, yet today many are utilized in perilous conditions (counting examination of radioactive materials, bomb recognition and deactivation), producing measures, or where people can't endure (for example in space, submerged, in high warmth, and tidy up and regulation of dangerous materials and radiation). Robots can take on any structure however some are shown up. This is said to help in the acknowledgment of a robot in certain replicative practices as a rule performed by individuals. Such robots endeavor to duplicate strolling, lifting, discourse, cognizance, or some other human action.

A considerable lot of the present robots are motivated commonly, adding to the field of Robotics. Advanced mechanics is a part of designing and science that incorporates gadgets designing, mechanical designing and software engineering, etc. This branch manages the plan, development, and use to control robots, tangible input and data preparing. These are a few advances which will supplant people and human exercises in coming years. These robots are intended to be utilized for any reason however these are utilizing in touchy conditions like bomb recognition, deactivation of different bombs and so on Robots can take any frame however large numbers of them have given the human appearance. The robots which have appeared as human appearance may prone to have the walk like people, discourse, and insight and in particular every one of the things a human can do.

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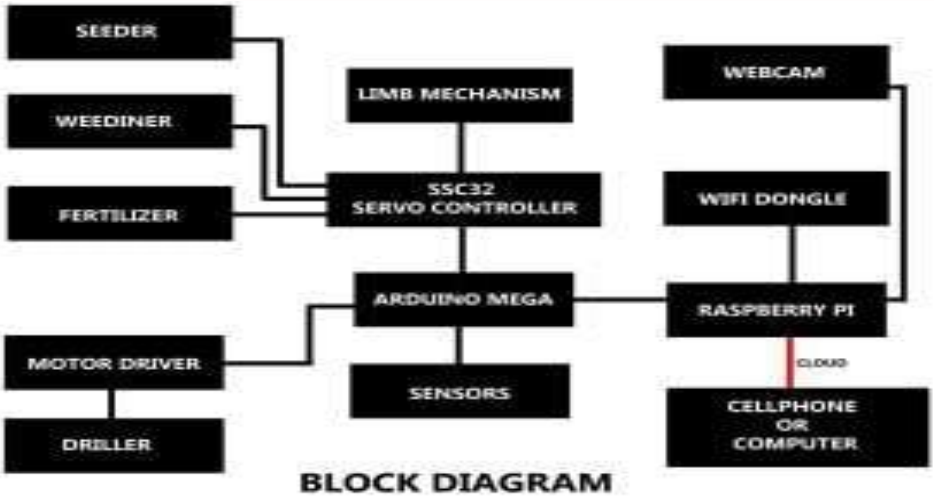

Fig 1: Block diagram of Agribot

Agriculture is the backbone of India. The history of Agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. Today, India ranks second worldwide in farm output. The special vehicles plays a major role in various fields such as industrial, medical, military applications etc., The special vehicle field are gradually increasing its productivity in agriculture field. Some of the major problems in the Indian agricultural are rising of input costs, availability of skilled labors, lack of water resources and crop monitoring. To overcome these problems, the automation technologies were used in agriculture. The automation in the agriculture could help farmers to reduce their efforts. The vehicles are being developed for the processes for ploughing, leveling, water spraying. All of these functions have not yet performed using a single vehicle. In this the robots are developed to concentrate in an efficient manner and also it is expected to perform the operations autonomously. The proposed idea implements the vehicle to perform the functions such as ploughing, seed sowing, mud leveling, water spraying. These functions can be integrated into a single vehicle and then performed.

The idea of applying robotics technology in agriculture is very new. In agriculture, the opportunities for robot-enhanced productivity are immense - and the robots are appearing on farms in various guises and in increasing numbers. We can expect the robots performing agricultural operations autonomously such as ploughing, seed sowing, mud closing and water spraying. Watching the farms day & night for an effective report, allowing farmers to reduce the environmental impact, increase precision and efficiency, and manage individual plants in novel ways.

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. This is especially important when the duties, that need be performed, are potentially harmful for the safety or the health of the workers, or when more conservative issues are granted by robotics. Heavy chemicals or drugs dispensers, manure or fertilizers spreaders, etc. are activities more and more concerned by the deployment of unmanned options.

II. BACKGROUND WORK

[1]Agribot is a robot designed for agricultural purpose. It is designed to minimize the labor of farmers in addition to increasing the speed and accuracy of the work. It performs the elementary functions involved in farming i.e. ploughing the field, sowing of seeds, covering the seeds with soil and water sprinkling. In India agriculture is the backbone of economy. 50% of the population is involved in farming activities directly appear on the plant leaves.

[2].In the current scenario most of the countries do not have sufficient skilled manpower specifically in agricultural sector and it affects the growth of developing countries. So it's a time to automate the sector to overcome this problem. An innovative idea of our project is to automate the process of sowing crops such as sunflower, baby corn, groundnut,

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cotton and vegetables like beans, lady's finger, pumpkin and pulses like black gram, green gram etc. to reduce the human effort and increase the yield.

[3]The plantations of seeds are automatically done by using DC motor. The distance between the two seeds are controlled and varied by using Microcontroller. It is also possible to cultivate different kinds of seeds with different distance. Also the project consists of sprinkler, which would be used for reducing the wastage of fertilizers that is done by spraying the senses from wheel movement and the on and off of the sprinkler would be controlled by Microcontroller. When the Robot reaches the end of the field we can change the direction with the help of remote switches.

As the quantity of work accessibility is decreasing step by step and their wages are expanding so there is prerequisite of higher profitability. Subsequently the gadget is to be planned which causes ranchers to beat the expressed issue. Pointed toward expanding the efficiency and lessening the work in question, the robot is intended to execute the fundamental capacities needed to be done in the ranches. In the current age the greater part of the nations don't have adequate talented labor explicitly in agrarian area and it influences the development of non-industrial nations. So it's an opportunity to computerize the area to beat this issue. In India there are 70% individuals reliant on farming. So we need to contemplate agribusiness. Imaginative thought of our undertaking is to mechanize the way toward furrowing and planting cultivating like sunflower, corn, groundnut and vegetables like beans, woman's finger, pumpkin and seed of wheat and so forth To decrease the human exertion and increment the yield. The furrowing of firm and manor of seeds is consequently done by utilizing dc engine. The distance between the two seeds are controlled and shifted by utilizing microcontroller. At the point when the robot arrives at the finish of the field we can alter the course with the assistance of far off switches. The entire interaction is constrained by microcontroller. Furrowing of firm and seed Plantation is our everyday life is finished by work vehicle in ranches. Yet, it requires additional time and the labor lack is confronted consistently. The fundamental prerequisite of mechanization is to diminish labor through our venture.

This venture work depicted here is very helpful in the agrarian fields. The task points on the plan Agricultural Robot for Spraying water, cultivating, Mulching and cutting activity". Over 42% of the absolute populace on the planet has picked farming as their essential occupation. As of late, the improvement of independent vehicles in agribusiness has encountered expanded interest. This advancement has driven numerous analysts to begin growing more reasonable and versatile vehicles. In the field of farming self-ruling vehicles, an idea is being created to research if different little independent machines would be more productive than customary enormous farm haulers and human power. These vehicles ought to be equipped for working 24 hours per day throughout the entire year, in most climate conditions and have the insight inserted inside them to act reasonably in a semi-common habitat throughout extensive stretches of time, unattended, while doing a helpful undertaking. There are various field activities that can be executed via self-sufficient vehicles, giving a larger number of advantages than traditional machines.

III. METHODOLOGY

The basic aim of this paper is to develop a multipurpose machine, which is used for digging the soil, seed sowing, and leveler to close the mud and water sprayer to spray water with least changes in accessories with minimum cost. This whole system of the robot works with the battery and the solar power. Micros, Spectrum ZX and Commodore 64 machines that people of an earlier generation learned to program on. • The base frame is made for the robot with 4 wheels connected and driven the rear wheel is dc motor.

• One end of the frame, cultivator is fitted which is also driven by dc motor and design is made to dig the soil.
• water pump sprayer to spray the water.
• Solar is placed on top of the robot and is connected to the battery for charging the battery.
• Thus the max efficiency is utilized from the sun by the solar panel and to the battery.
• The whole robot requires the 12v battery to operate the system.
• IR transmitter and IR receiver is used to control the operation of the vehicle.

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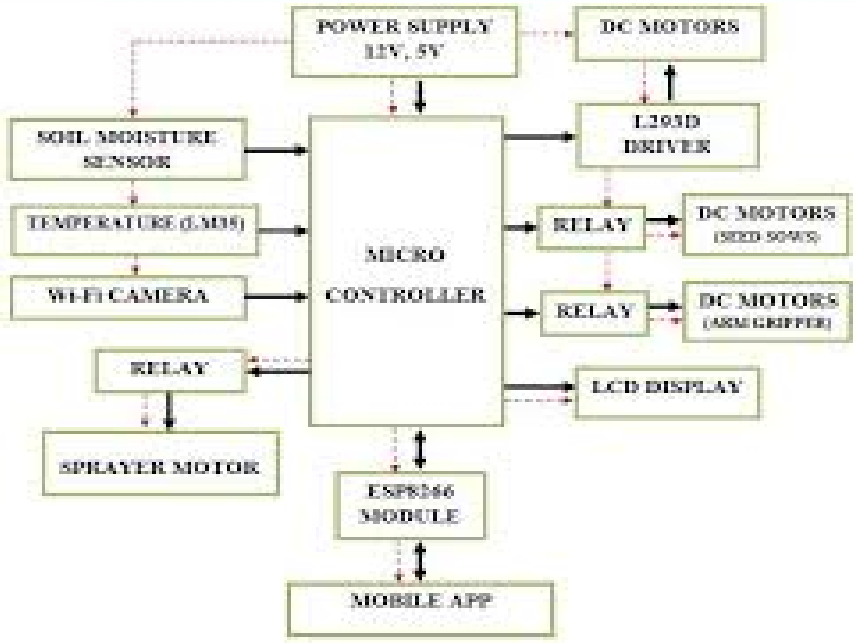

Fig 2: Smart Phone Operated Multipurpose Agricultural Robotic Vehicle- AGRIBOT

Robotics is playing a significant role in agricultural production and management. There is a need for autonomous and time saving technology in agriculture to have efficient farm management. The researchers are now focusing towards different farming operational parameters to design autonomous agricultural vehicles as the conventional farm machineries are crop and topological dependent. Till date the agricultural robots have been researched and developed principally for harvesting, chemical spraying, picking fruits and monitoring of crops. Robots like these are perfect substitute for manpower to a great extent as they deploy unmanned sensing and machinery systems.

The prime benefits of development of autonomous and intelligent agricultural robots are to improve repeatable precision, efficacy, reliability and minimization of soil compaction and drudgery. The robots have potential for multitasking, sensory acuity, operational consistency as well assuitability to odd operating conditions. The study on agricultural robotic system had been done using model structure design mingled with different precision farming machineries. Few prototypes were designed by European Union named CROPS, USA-ISAAC2 &MichiganHortibot, Australia-AgBot, Finland-Demeter, India-Agribot and many other countries. The agricultural robots are designed using different localization techniques which are vision, GPS, laser and sensor based navigation control system. In this paper, comparative study including an overview of Robotics approach for precision Agriculture in India and worldwide development is explored.

IV. EXPERIMENTAL RESULTS

Project is constructed as agribot (4 – wheeled robot) using PIC microcontroller 16F877A, IR sensors, Moisture sensors, Water pump motor, Motor driver, DC motor, Robotic arm, Switch, Rotor, Solar panel.

This task depends on horticulture improvement. Here, we utilize remote association for the working of AGROBOT. It runs in the force supply of 12V . There are sensors which sense dampness and temperature for the necessities of soil ripeness and harvest developing. Microcontroller gets information through the worker and works. There are engines which associated for the sprinkler of water and pesticides. This is a biggest benefit where this can deal with the less manual force and there will no illness spreading. It is a most secure strategy where yields can develop without need of manual works. The sprinkler, seed sower and engines are controlled through microcontroller. Information from sensors and directions for meanderer development is sent and gotten separately utilizing ESP8266. It is associated with versatile through cloud.

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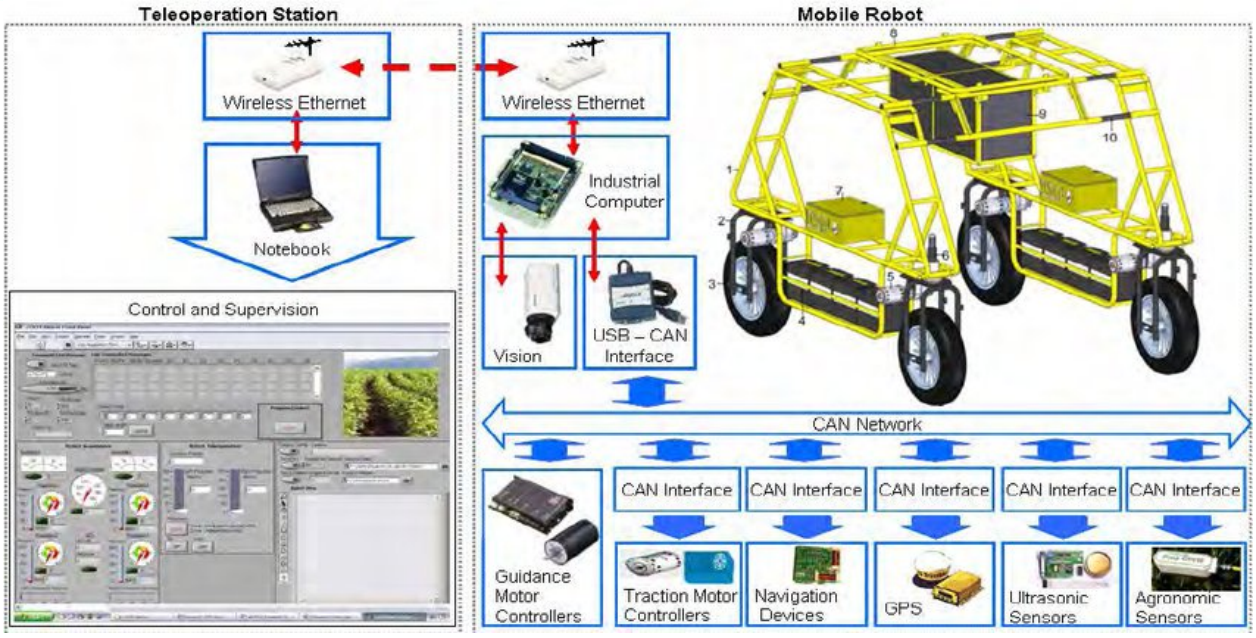

Fig 3: Architecture of the agriculture mobile robot

Agribot (4 – wheeled robot) is initiated with the power "ON". The agribot starts moving in forward direction along with the two sensors – IR sensor and Moisture sensors are also turned "ON". These are used to monitor the environment in real time. IR sensors are used to turn on rotor in order to cut the unwanted weeds (or) grasses. Likewise, moisture sensors are used to sense moistness in the soil and turn ON or OFF the water pump for watering the plants. Robotic arm is constructed by switch for ploughing the land. Bluetooth interfaced android app is used to monitor the operation status of Robot. Steps involved in monitoring of Robot.

Application scans for the Bluetooth interface (HC-05) Robot. (2) once, the robot connected to the phone successfully. (3) There are three 3 communication mode – (i) Byte stream mode, (ii) Keyboard mode, (iii) Command line mode. (4) Select Byte stream mode – Successfully connected. (5) In Byte stream mode, operational status of agribot – (i) Pumping motor ON (or) (ii) Rotor is on for leveling or removing grass. (iii) Robot is going to digging.

V. 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. One of the advantages of the smaller machines is that they may be more acceptable to the non-farm community. The jobs in agriculture are a drag, dangerous, require intelligence and quick, though highly repetitive decisions hence robots can be rightly substituted with human operator. The higher quality products can be sensed by machines (color, firmness, weight, density, ripeness, size, shape) accurately. Robots can improve the quality of our lives but there are downsides. The present situation in our country all the agricultural machine is working on manual operation otherwise by petrol engine or tractor is expensive, farmer can't work for long time manually to avoid this problem, we need to have some kind of power source system to operate the digging machine.

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