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SMART CINDEROOMBA

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ABSTRACT

The households of today are becoming smarter and more creates more time for people. Domestic robots are enteringthe homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predictedand the adoption of domestic robots is evolving. Several robotic vacuum cleaners are available on the market but only few ones implement wet cleaning of floors. The purpose of this Project is to design and implement a Vacuum Robot Autonomous and Manual via Phone Application, Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. The main objective of this Project is to design and implement avacuum robot prototype by using Arduino Mega. Arduino Shield, LDR Sensor, Real Time Clock. Arduino uno and Motor Ultrasonic Sensor, and to achieve the goal of this Project Phase- 1. Robot will have several criteria that are user-friendly ride.

All these garden cleaners have a mysterious serial number attached to them, like something out the movies. But this is the smart garden cleaning robot. It's perfectly designed for small space gardens, and can cover up to 500m2 in justa few hours a week. It can be programmed to avoid obstacles like garden furniture, bushes and the household cat. The robot mower's concept was to get the job done in as little time as possible, so you can "enjoy your lawn unhindered". And it can run for two and a half hours on one charge. It's also fully automated, meaning it will chargeitself and move on a schedule all by itself.

Keyword: *home automation, Roomba, Robot, Arduino mega*

INTRODUCTION

In recent years, robotic cleaners have taken major attention in robotics research due to their effectivenessin assisting humans in Garden cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops, ware Gardens and universities etc. Basically, robotic cleaners are distinguished on their cleaning expertise like Garden mopping, dry vacuum cleaning etc. Some products are based on simple obstacle avoidance using infrared sensors while some utilize laser mapping technique. Each cleaning andoperating mechanism of robotic Garden cleaners has its own advantages and disadvantages. For example,robots utilizing laser mapping are relatively faster, less time consuming and energy efficient but costly, while obstacle Avoidance based robots are relatively time consuming and less energy efficient due to random cleaning but less costly. Countries like India are way back in manufacturing robotic cleaners. Importing

them from abroad increases their costs. The main objective of this work is to provide a substantial solution to the problem of manufacturing robotic cleaner utilizing local resources while keeping it low costs. In this work, “Smart Garden cleaning robot (CLEAR)” has been designed to consumer/office environments and its each component in accordance with IEEE Standard is discussed. Proposed design is being operated in dual modes.

Automated garden cleaning is progressively refined, are self-docking and some contain downpour sensors,if important, almost disposing of human communication. However, we can't wipe out every one of the works who are expected for cleaning of gardening, we need to save up to 25% of laborers for cleaning since this gardening Roomba can't gather all the waste and gathered and isolated waste ought to be takenfrom the human and that will be unloaded for dustbin by the individual its self.

LITERATURE SURVEY

Uman Khalid & Muhammad faze Baloch in had presented the design, development and fabrication of prototype smart floor cleaning robot using IEEE standard 1621. This ROBOT is specially made on the basis of modern technology. Clear has all the features which are required for a vacuum cleaner. It can work automatically and manually [1].

Karthick. T, Ravikumar. A. Selvakumar. L, Viknesh .T, has discussed the idea to develop an autonomous ROBOT that can be move itself without continuous human guidance. The autonomous cleaner ROBOT system which can be consumes very less power on comparing with existing system. The existing system consumes very high power of 500W for suction whereas "Automatic and manual vacuum cleaning robot" required 10W for suction. In the field of robotics, there appear several autonomous as well as the manual-based cleaning robots. They include many unique features which are subjected to make user friendly. According to the survey automatic cleaning robots are more convenient than manual based machines. The autonomous cleaning robots are intelligently programmed that serves the basic function of cleaning [2].

Naman Agrawal, Piyusha Chaudhari, Anshul Mishrain in 'Review paper based on cleaning ROBOT". This paper a human friendlycleaning ROBOT system for the domestic over all environment through conventional automatic cleaning ROBOTS already exist. A prototype of the rotating brush device is made manually to ensure the cleaningeffect of the proposed system. From this all-research paper we conclude that the drawback of this researchis the robot can be work automatically as well manually from that now us going to implement the robot which can be work without human effort [3].

Manreet Kaur & Preeti abro: Manual work is taken over the robot technology and many of the related robot appliances are being used extensively also. Here represents the technology that proposed the working of robot for floor cleaning. This floor cleaner robotcan work in any of two modes i.e. "Automatic and Manual"[4].

Prathmesh Joshi, Akshay Malviya & Priya Soni: This Project report is based on the "Manually Driven Platform Cleaning Machine" which provide the basic needs of cleaning ground floors. Robotic Vacuum Cleaner The paper addresses about the robot which is controlled by the android application through Bluetooth module. The application sendsthe information to microcontroller to have control over robot. The distance of the obstacles is detected using the ultrasonic sensors and the distance is displayed on LCD and as well as on application. Here man controls the overall operation indirectly. Bluetooth Based Automatic Floor Cleaning System In thepublished paper, the model is designed

to clean the floor with wet and dry. The Bluetooth module is usedfor controlling entire system with the help of remote or mobile. By using Bluetooth module, we can direct and turn the system as the user needs [5]

METHODOLOGY

The Smart Cinderoomba is the robot which cleans the floor or cleans the area where in the gardens school gardens, college campus, offices etc.

Now a days in every place the garden is made and the garden have to be cleaned every day.

Coming to the working system, here we have used the camara for object detection for detecting the wastefor example; bio degradable and nonbiodegradable.

After detecting the waste, the nonbiodegradable waste is picked up with the help of the robotic arm and dropped in the tray which we have provided in the vehicle.

In manual mode the robot can be manually located with the help of the remote, and it can be moved for the staring position of the work or to travel from one place to another place.

Lcd display is used for the users who are using this Smart Cinderoomba, because in auto mode, the user will come to know that is what is the status is going on the field or garden with the help of the lcd display.

The ultrasonic sensor is used for detecting the obstacle, while cleaning many obstacles can be detected, for this reason we have used the ultrasonic sensor, whenever the obstacle is detected, the robot is stopped for 10 seconds, if the obstacle is moved the robot will continue in the same path or else the robot will change the path or direction with respect to the obstacle detected, with the help of the ultrasonic sensor.

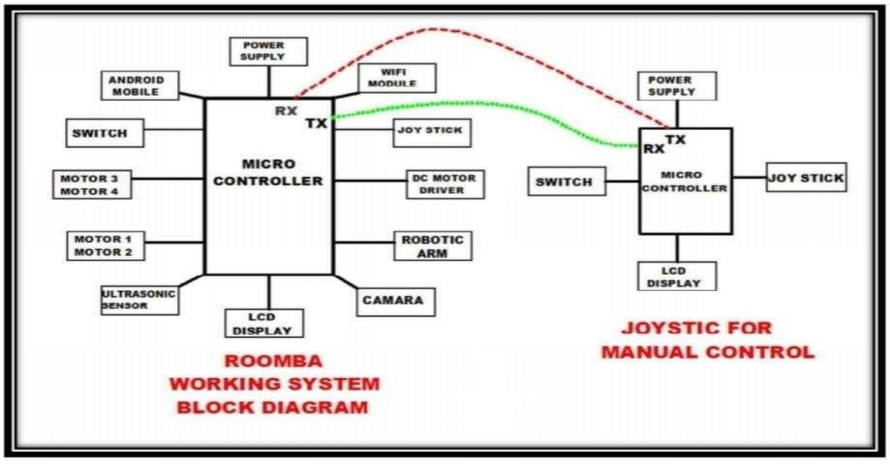

Fig: Block Diagram of Smart Cinderoomb

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- **Arduino Mega**

Arduino Mega 2560) is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM output), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything nooded to support the microcontroller, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or hatery to get started Microcontroller ATmega2560 Operating Voltage SV Input Voltage (recor 12V Input Voltage (limits) 6-20V Digital DO Pins $4 (of which 14 provid Analog Input Pins 16 DC Current per DO Pin 40 mA DC Current for 3 Flash Memory 256 KB of which KKB used by bootloader SRAM & KB EE Clock Speed 16 MH Communication The Arduino Mega2560 has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega2560 provides four hardware UARTs for TTL (SV) serial communication. An ATmega162 (ATmega 8U2 on the revision 1 and revision 2 boards) on the board channels one of these over USB and provides a virtual com port to software on the computer (Windows machines will need a inf file, but OSX and Linux machines will recognize the board as a COM port automatically. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the board**.**

- **ESP8266 Cam camera**

ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability An ESP8266 Wi-Fi module is a SOC microchip mainly used for the development of end-point loT (Internet of things) applications. It is referred to as a standalone wireless transceiver, available at a very low price. It is used to enable the internet connection to various applications of embedded systems, if systems designed the ESP8266 Wi-Fi module to support both the TCP/IP capability and the microcontroller access to any Wi-Fi network. It provides the solutions to meet the requirements of industries of loT such as cost, power, performance, and design. It can work as either a slave or a standalone application. If the ESP8266 Wi-Fi runs as a slave to a microcontroller host, then it can be used as a Wi-Fi adaptor to any type of microcontroller using UART or SPI. If the module is used as a standalone application, then it provides the functions of the microcontroller and Wi-Fi network. The ESP8266 Wi-Fi module is highly integrated with RF balun, power modules, RF transmitter and receiver, analog transmitter and receiver, amplifiers, filters, digital baseband, power modules, external circuitry, and other necessary components. The ESP8266 Wi-Fi module comes with a boot ROM of 64 KB, user data RAM of 80 KB, and instruction RAM of 32 KB. It can support 802.11 b/g/n Wi-Fi network at 2.4 GHz along with the features of 12C, SPI, 12C interfacing with DMA, and 10-bit ADC. Interfacing this module with the microcontroller can be done easily through a serial port. An external voltage converter is required only if the operating voltage exceeds 3.6 Volts. It is most widely used in robotics and IoT applications due to its low cost and compact size.

- **Robotic arm**

Robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm; the arm maybe the sum total of the mechanism or may be part of a more complex robot. The links of such a manipulator are connected by

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joints allowing either rotational motion (such as in an articulated robot) or translational (linear) displacement. Thelinks of the manipulator can be considered to form a kinematic chain. The terminus of the kinematic chain of the manipulator is called the end effector and it is analogous to the human hand. However, the term "robotic hand" as a synonym of the robotic arm is often proscribed.

ADVANTAGES

- Fully automated.
- Saving Man power.
- Economic.
- Possibility of auto control.
- Reduction in time consumption.

APPLICATIONS

- Schools
- Colleges and other Organizations
- Small Play Grounds
- Some Small Open Spaces
- Campus or garden

RESULT

The smart garden cleaning robot is making cleaning process by separating degradable andnonbiodegradable waste. can detect the waste and segregate the waste by manual control with help of joystick. And cleaning process become easier rather than by using manual sweepers and their efforts. And also it is user- friendly.

SLNO.	DESCRIPTION
1	BATTERY CAPPACITY:12V 2.5 AH 6V 4.5 AH
2	AREA COVERAGE: 5 minutes for 10*10m area
3	PROTOTYPE WEIGHT:Approx 3.5 kg

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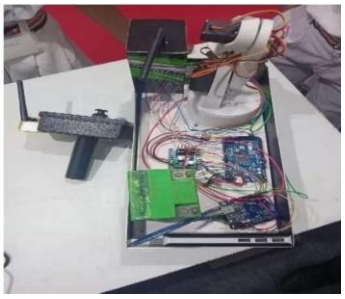

Final Output Pictures:

CONCLUSION

The Proposed Project is been successfully completed. The garden cleaning robot model prototype presents the design and implementation of an Automatic Garden cleaning System controlled by wirelessly and the speed of thevehicle can be reduced automatically due to the sensing of the obstacles. The model can be developed with more advanced speed control system for automobile safety, while realizing that this certainly requires tons of work and learning, like the programming and operation of microcontrollers and the automobile structure. Hence, the incorporation of all components in garden cleaning robot will maximize safety and also give such system a bigger market space and a competitive edge in the market.

FUTURE SCOPE

It is to develop an automatic device that can derived from control room by internet of thing that work of cleaning garden without any need of personnel and we need to just click a start button of the robot in smartphone application. This Project has a scope in the areas like a large floor area, like school grounds.

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