A SURVEY ON AUTOMATIC AND MANUAL FLOOR CLEANING ROBOT

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Abstract: Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and 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 which has two cleaning modes Autonomous and Manual mode and manual mode is 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 a vacuum robot prototype by using Arduino Uno, Sensors, DC motor, motor driver L298N, Ultrasonic Sensor, and Vaccum suction unit and to achieve the goal of this project. Vacuum Robot will have several criteria that are user-friendly. With the advancement of technology, robots are getting more attention of researches to make life of mankind comfortable. This projects presents the design, development and fabrication of prototype automatic floor cleaner. This robot operates autonomous mode with additional features like dirt container with air vacuum mechanism and pick and place mechanism. This work is very useful in improving life style of mankind

Index Terms – **Ultrasonic sensor, Motor driver , vacuum unit, dustbin unit**

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I. INTRODUCTION

From the very beginning of human era, cleaning was one of the tedious tasks. There were many methods for cleaning the premises. But those methods were tedious and needed high effort. It became difficult for the working population to find time for room cleaning. Because of the difficulties, the existed system was not considered as an efficient method. As the technology has advanced, with the help of automation this task was made much more efficient. This paper presents about how the burden of cleaning can drastically be reduced by means of using an automatic floor cleaner capable of accepting user commands via mobile. Main objective of this project is to design and implement a robot by using Arduino Uno, Motor driver L293D, Ultrasonic Sensor, LCD display and thereby controlling the robot through user commands by means of GSM and Wi-Fi technology.

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in each every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as Human now a days. Mostly an average human uses 2-3 robots per day in his day to day life.

Sensors are the sensing devices which transmit a signal and receives the signal and accordingly used to accumulate the various environment information which is ultimately fed to microcontroller for deciding the working of machines. Microcontroller is the brain of robot where program is written and sensors are connected as input and actuators as output.

II. LITERATURE SURVEY

Presents the design, development and fabrication of prototype Smart Floor Cleaning Robot (CLEAR). Subject robot operates in autonomous mode as well as in manual mode along with additional features like scheduling for specific time and bag less dirt container with auto-dirt disposal mechanism. This robot (CLEAR) 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. It has the feature of the scheduling and it can auto drain itself. CLEAR has many competitors who are selling same product in high prices..[1]

The floor cleaning using automatic and manual modes. They have used RF modules for wireless communication between remote and robot having range of 50m. In the automatic mode, robot controls all operations itself and changes the lane in case of hurdle detection and moves back. In the manual mode keypad is used to perform the expected task and to operate the robot. It follows zigzag path. To make whole system wireless, RF modules have been used in automatic and manual with 50m range. For user convenience automatic water sprayer is attached which automatically spray water for mopping, therefore no need to attach wet cloth again and again for mopping.[2]

Mint cleaning robot which is an automatic cleaning robot that sweeps and mops hard surface floors using dusting and moping cloth was developed. It investigates the product's social impact with respect to the attitude of customers towards a systematic floor cleaner and how much a robot influences a lifestyle. Systematic cleaning was an important feature and modifications to the

environment to support the navigation of the robot. The robot employs a systematic cleaning strategy that maps the environment using GPS like indoor localization.[3]

Presents Indoor Applications. Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving. Several robotic floor cleaners are available on the market but only few ones implement wet cleaning of floors. The purpose of this project is to design and develop Robotic Floor Cleaner. Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. The project aimed to design and implement of semi-automatic robotic floor cleaner with obstacle avoidance and wet cleaning attachment.[4]

Presents a comprehensive overview of the technological advantages helped in the real life various. For the convenience of most of the people who are extremely busy in there chores. The need of the project has come up because of a busy schedule of a working in a corporate sector. So this has resulted in coming up with an objective of making an automated vacuum cleaner. The study comprehend of automated vacuum cleaner which having components to DC motor operated wheels, roller brush, cleaning mop, the garbage container and obstacle avoidance sensor. A 12V rechargeable battery is used as power supply. Other than this is compresses of special technique of UV germicidal cleaning technology. The study has been done keeping in mind economic cost of product.[5]

Presents the operating room cleaning robot provided with 'Manual' and 'Automatic' control is used for operating room cleaning purposes. The cleaning procedure comprises of vacuum suction of dust, disinfecting the area followed by mopping. The cleaning is done for both horizontal and vertical surfaces of the operating room. This battery driven robot has the capability to store the overall dimensions of the operating room along with the predetermined path that it is being trained off to follow during the cleaning process. It can be manually controlled using the remote control in order to have some specific function done apart from the normal trained cleaning. It is equipped with ultrasonic sensor for obstacle detection thus do not cause harm to any objects or persons around [6].

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The design, development and fabrication of prototype automatic floor cleaner. This robot operates autonomous mode with additional features like dirt container with air vacuum mechanism and pick and place mechanism. This work is very useful in improving life style of mankind. In one of the mode this robot is fully automatic and making decisions on the basis of humans or various sensors which are used in this cleaning robot. These sensors are controlled by Arduino controller also controls the DC motors with the help of driving circuitry. In manual mode, the robot can also be used to clean specific area of a room. This floor cleaner robot can work in any of two modes i.e. Automatic and Manual. RF modules have been used for wireless communication between remote and robot. This robot is incorporated with IR sensor for obstacle detection [8].

A small robotic device which can clean any table surface easily without any help from the user. The device can able to work in two different modes. It can be controlled by using sound and by using a mobile phone. This device consist of a chassis in which four motor wheels are connected. And each motor wheel is connected to a microcontroller which helps the device to move around the surface. At-mega 8development board is used to control the device. Another circuit board is used to include the necessary components used to control the device with the help of mobile phones. It can be also controlled with the help of a sound sensor which is connected to the microcontroller [9].

III. CONCLUSION

The Product developed is definitely a very important product in robotics and floor cleaning area. This research facilitates efficient floor cleaning with sweeping and mopping operations. This robot works in two modes automatic and manual for user convenience. This proposed work provides the hurdle detection in case of any obstacle that comes in its way. An automatic water sprayer is attached which sprays water for mopping purpose for the convenience of user. User can also operate this robot manually with the help of smartphone. It reduces the labor cost and saves time also and provides efficient cleaning. In automatic mode, the robot operates autonomously. The operations such as sweeping, mopping and changing the path in case of hurdle are performed automatically nevertheless, there are still new ideas to improve the developed system and to add new functionality to it.

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