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ROBOMOP

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***Abstract*— Households of today are becoming smarter and more automated. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. Several robotic vacuum cleaners are available on the market but only few ones implement complete cleaning of floors. The purpose of this project is to design and implement a Vacuum Robot which is Autonomous. The main objective of this project is to design and implement a vacuum robot prototype by using Arduino Mega, Ultrasonic Modules, DAC/ADC, DC Motors, Servo Motor and Battery protection unit to achieve the goal of this project. Vacuum Robot will have several criteria that are user-friendly.**

Keywords—Autonomous robot, Matlab mapping, Machine learning Techniques

I. INTRODUCTION

A very notable household chore is floor cleaning which is often considered unpleasant, tedious and boring. In most cases, cleaners are hired to do the task rather than the household residents do it. A vacuum cleaner is an electromechanical appliance commonly used for cleaning floors, furniture, rugs and carpets by suction. An electric motor inside the appliance turns a fan which creates a partial vacuum and causes outside air to rush into the evacuated space. This forces any dirt or dust near the nozzle into a bag inside the machine or attached to the outside. A robotic vacuum cleaner, is an autonomous robotic vacuum cleaner which has intelligent programming and a limited vacuum floor cleaning system. The original design included manual operation via remote control and a self-drive mode which allowed the machine to clean autonomously without human control. Some designs use spinning brushes to reach tight corners, and some include a number of cleaning features along with the vacuuming feature like mopping, UV sterilization, etc. In the recent years, robots have been used for various cleaning purposes. Robots have various cleaning expertise like mopping, picking up the waste, wet floor cleaning, dry vacuum cleaning etc., Depending on the cleaning mechanism, these robots may have some advantages and disadvantages.

II. PROBLEM ANALYSIS

The existing vacuum cleaners have some drawbacks like colliding with obstacles and stopped at a shorter distance from walls and other objects. It is unable to reach to all corners and edges of the room and because of this some of the areas are left unclean. An automatic floor cleaner robot has brushes attached to its sides to collect the dust. The proposed robot uses ultrasonic sensors to avoid obstacles and change its direction and it also has a suction unit that sucks in the dust while moving around the room freely.

III. OBJECTIVE

The objective of this system is to present an automated vacuum cleaning device which is capable of cleaning floors by using an intelligent programming and limited vacuum system. Movement based on obstacle avoiding technique. Cleaning and back to the dock charging with the help of machine learning. The device can be controlled from remote places using IoT technology. Removes acrid scent using an aromatic fumigator.

IV. SCOPE OF WORK

Current vacuum cleaners, although efficient, are rather bulky and therefore require large manpower for proper functioning. The earlier known cleaners are those of Daniel Hess of Iowa in1860 and Ives W, McGaffey of Chicago in 1868. While the former used bellows to generate suction and gathered dust with a rotating brush, the latter worked with a belt driven by hand-cranked fan making it awkward to operate. In the late 1990s and early 2000s, more efficient sweepers equipped with limited suction power were developed.

Some prominent brands are iRoomba, Neato and b0bsweep. Depending on the design target, robotic vacuum cleaners are appropriate for offices, hotels, hospitals and homes However, most cheap cleaners need a better cleaning pattern algorithm for efficient functioning while the smart ones are rather costly, and thus beyond the reach of most homes.

An advantage of using a robotic vacuum cleaner is how quiet it is compared to a regular vacuum cleaner. Also, they are seen as more convenient to use because they can vacuum on their own. Robotic vacuums can be kept under beds or desks or in closets, whereas a regular vacuum cleaner requires a larger amount of space.

The robot's workplace is often challenging, frequently requiring work in areas that are too dangerous or difficult for humans to reach, and can contain chaotic and unforeseen variables. The exact type, orientation and location of the robot's next object of work, for example, can all vary unpredictably (at least from the robot's point of view). The robot must be able to deal with these changes

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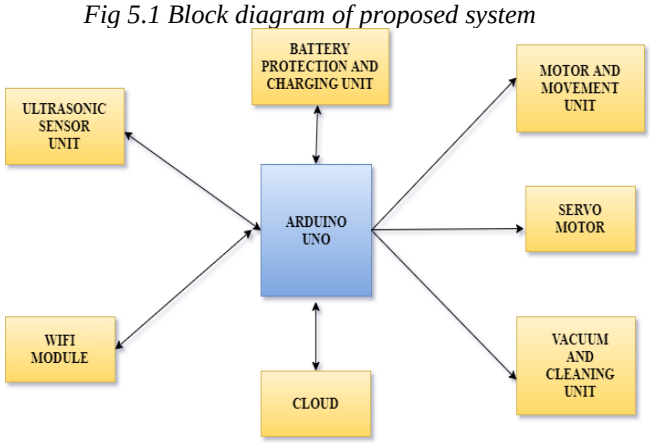
and apply different solutions, although they occasionally need a little help from a human minder.

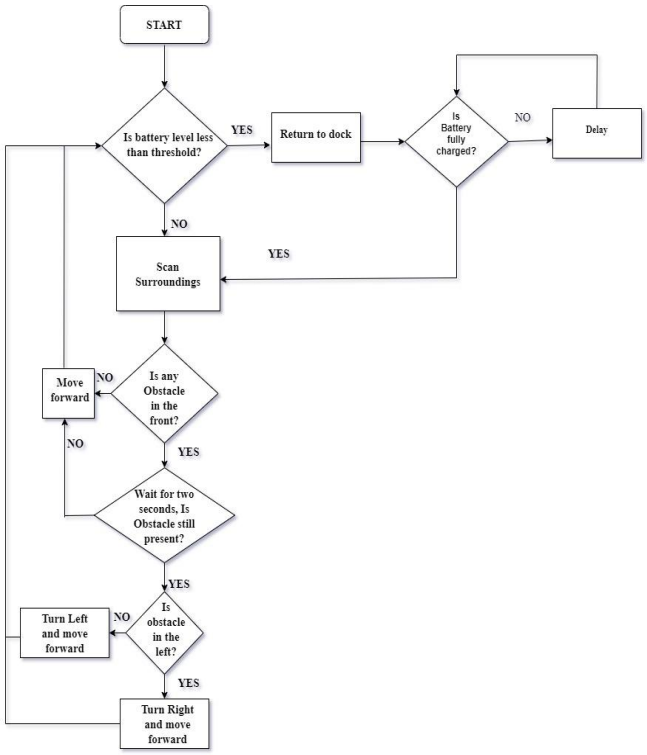
When it comes to sensors, as with software, different robots use different types. Simpler forms of autonomous robot, for example autonomous vacuum cleaners, rely on infrared or ultrasound sensors to navigate and 'see' their environment. Higher-level robots, like autonomous vehicles, tend to use cameras, radars (radio sensors) or lidars (laser sensors) that give them the ability to constantly identify and categorize the things they 'see'. These sensors are essential for gathering the necessary data, along with that the robot may receive from other data sources such as maps, to allow it to constantly assess its environs and make real-time 'decisions'. The more advanced robots need this decision-making ability in order to execute three principal tasks: obstacle avoidance, localization and mapping, and route planning.

V. ARCHITECTURE

Fig 5.1 Block diagram of proposed system



VI. FLOWCHART



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