

WET BOT (Cleaning Robot)

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Abstract

In recent years, there have been rise in the number of applications based on vacuum cleaning robots and have been successfully applied to residential areas as drivers homes, Schools/colleges, hospitals, offices and many more areas. The vacuum cleaning robots includes driving wheels, a collecting unit of suctioning dust from the floor and wiping unit for wiping the floor with detergent, disinfected wax, etc. This dissertation describes about the AI based cleaning robot which can automatically clean without any interference of person.

Our main objective is to innovate a cleaning robot which can clean by itself without instructions of a person. We would achieve this by implementing Artificial Intelligence which will help robot to work by itself without any commands by the instructor. The user had to set the time so that the robot starts cleaning the areas by itself even if the person is not available. And the dust will automatically into dust bags and easy to throw away. Apart from the other cleaning robots, this uniqueness of this robot is, it will clean every corner, edge of the residential area.

Introduction

Purpose of work

As we know that people are always busy with their work that they can't even spare time for cleaning their households. Keeping this problem in mind. In 1996 the First Robotic Vacuum cleaner has been introduced. Because of this invention man has consumed less time for cleaning his house. As, years passed these robots are being innovated by adding Micro Controllers & Micro Processors. Due to this time has been even more consumed.

But the major drawback of these robots is that they are not understandable to receive the commands from the instructor. Keeping all these drawbacks in mind. We are working on a

Project called "WET BOT" which cleans by itself.

Scope of Work

Our project involves more cleaning techniques like edge to edge cleaning, smooth washing systems, Anti collision system and main thing in this robotics it works on both Artificial Intelligence and manually operated with smart device. The present study has been made to suggest and develop a method which will eventually be useful to clean homes, offices, hospitals and any other residential purposes.

The robots are classified according to that predetermined works like floor

cleaning, wiping glass doors, toilet cleaning, floor mopping and so on and so forth. They also involve the action of the individual.

Chapter 2

LITERATURE SURVEY

ARTIFICIAL INTELLIGENCE-based command system:

In this paper Artificial Intelligence has been used for command purpose. As we know Artificial Intelligence is a combination of human intelligence and machine function. It includes training (user will input to the machine and machine train itself to understand the given scenario), figuring of error (after training the machine uses trail or error method to detect obstacles) and self-correction.

Implementation of Artificial Intelligence using supervised and unsupervised learning methods:

Supervised learning is learning in which we profess or explain the machine using data which is well designated that means some data is already appended with the correct answer. After that the machine is allocated with new set of examples so that supervised learning algorithm concludes the training data and gives a correct output for designated data.

Unsupervised learning is learning of machine using information that is neither arranged nor designated and allowing the algorithm to act on that information without any advice. Here the piece of work to be done by the machine is to group unsorted information according to differences, patterns without any prior learning of data.

Unlike supervised learning, no one can instruct that means no training will be given to the machine. Consequently the machine is regulated to find the unseen data by our-self.

In this project our robot is trained in supervised learning and executed in unsupervised learning.

Chapter 3

Problem Statement

Whenever the person wants to clean their households, it was very difficult for them to spend time for cleaning. An average person working works will be between 8 to 13 hours per day, after that hectic work he will be not in a situation to clean his households and try to postpone his cleaning work, so day by day cleaning the household work has been increasing. At certain point he may feel burden and he select to employ a maid, generally nowadays maids demanding for more money and for an average person maintaining maid also comes under extra spending. In order to overcome this drawback we thought of the present working project known as the The algorithm is such that whenever the Robot time is set, automatically the robot will begin to clean the residential, saves 70 percent of manpower. And this robot is affordable. For example a maid will earn on an average of 36000 per annum compared to that robot will be more affordable at range of 5000 to 10000 which is economically affordable by an average person. Moreover this robot will clean automatically and only thing the person has to do is to set the time navigate the house the residential environment at only one time.

Chapter 4

HARDWARES AND SOFTWARES USED

Various hardware components are used in this project are mentioned below

- Arduino Uno
- Stepper motor
- Crawlers
- Suction unit
- Jumper wires
- Battery

Arduino Uno



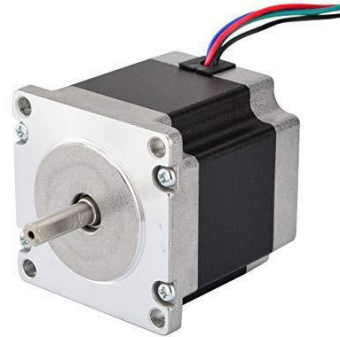
The **Arduino Uno** is an open-source microcontroller board based on the Microchip ATmega328p microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various Expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and is programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

The word "uno" means "one" in Italian and was chosen to mark the initial release of the Arduino Uno. The Uno board is the first in a series of USB-based Arduino boards, and it and version 1.0 of the Arduino IDE were the reference versions of Arduino, now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer.

While the Uno communicates using the original STK500 protocol, it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to

version R2) programmed as a USB to serial converter.

Stepper Motor



A **stepper motor**, also known as **step motor** or **stepping motor**, is a brushless DC electric motor that divides a full rotation into a number of equal steps. The motor's position can then be commanded to move and hold at one of these steps without any position sensor for feedback (an open-loop controller), as long as the motor is carefully sized to the application in respect to torque and speed.

Switched reluctance motors are very large stepping motors with a reduced pole count, and generally are closed-loop commutated.

Various software components are used in this project are mentioned below

- Artificial intelligence
- Arduino Uno
- Tinker cad

Chapter 5

3d design sketch of our project is displayed below

Dimensions:

Length : 350 mm , Width : 250 mm ,
Height : 70 mm , wheel
circumference : 50 mm , wheel
thickness : 20 mm , caster ball
radius : 50 mm

TOP VIEW:

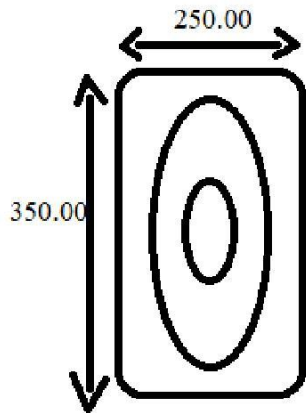


Fig no 1

RIGHT VIEW:

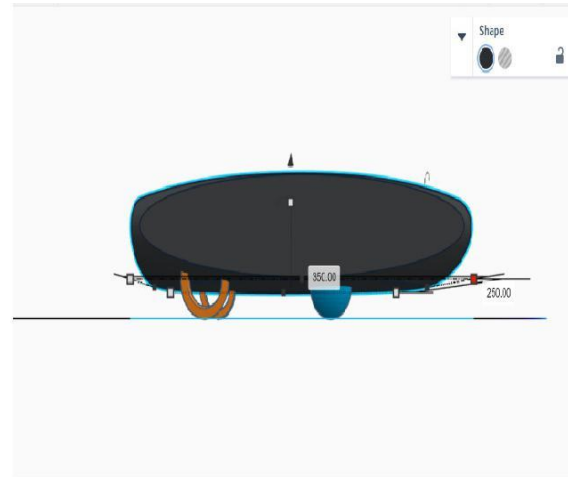


Fig no 3

FRONT VIEW:

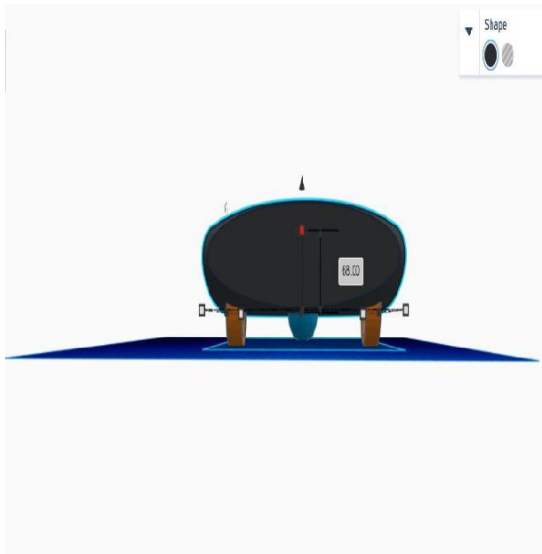


Fig no 2

LEFT VIEW:

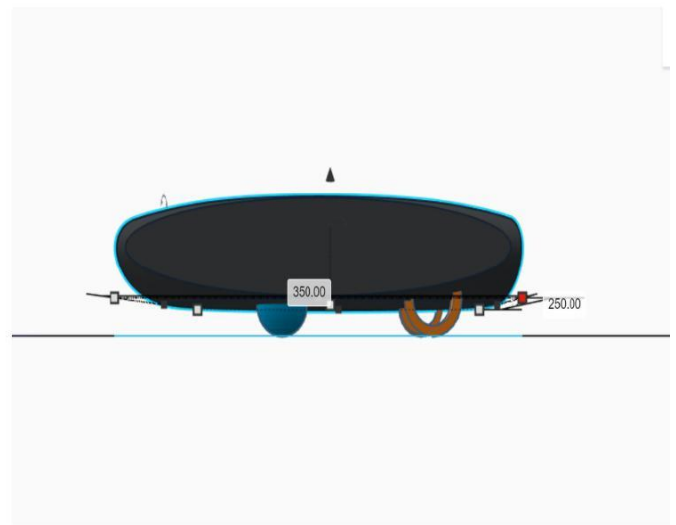


Fig no 4

BACK VIEW:

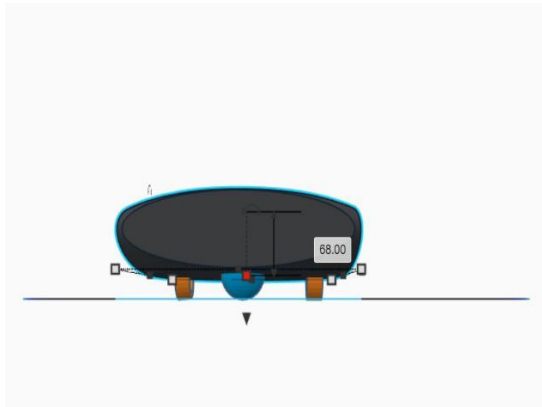


Fig no 5

BOTTOM VIEW:

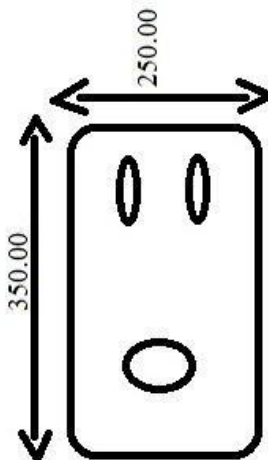


Fig no 6

Advantages

- The major advantage of this robot is its square line structure which helps in edge to edge cleaning.
- Purely AI based command systems and it can also be operated manually using smart mobile
- Economical ly affordable by an average person.
- It is very hygienic hence it can be easily adaptable to any kind of residential areas like, offices, schools, colleges etc.
- It is also a “User Defined Two way cleaning system” which will clean and mop simultaneously.
- Obstacles will be detected
- Wireless charging

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4. <https://www.geeksforgeeks.org/supervised-unsupervised-learning/>
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