

Automatic Vacuum Cleaner Using Arduino

¹Mr. P. B. Jarande, ² Shreyash Pandhari Murakar, ³ Neha Sachidanand Vast, ⁴ Nikita Prakash Ubale, ⁵ Siddhesh Sanjay Saraf.

¹ Assist. Prof. (SSPM's COE Kankavli)

^{2,3,4,5} SSPM's COE Kankavli

¹ Pravin.jarande@yahoo.co.in, ² shreyashmurakar@gmail.com, ³ neha.vast12@gmail.com ⁴ nikitapubale16@gmail.com, ⁵ siddheshsaraf@gmail.com

Abstract— In recent years, robotic cleaners have taken major attention in robotics research due to their effectiveness in assisting humans in or cleaning applications at homes, hotels, restaurants, hospitals, workshops, warehouses and universities etc. Basically, robotic cleaners are differentiate on their cleaning expertise like or mopping, dry vacuum cleaning etc. Some products are based on obstacle avoidance using infrared sensors while some uses laser mapping technique. Each cleaning mechanism of robotic cleaners has its own advantages and disadvantages. 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. The main objective of this work is to provide a substantial solution to the problem of manufacturing robotic cleaner utilizing local resources while keeping.

Index Terms— Robotics cleaner, obstacles avoidance, assisting human, utilize laser mapping technology.

I. INTRODUCTION

Household cleaning is a repetitive task carried out by number of people every day. Hence there is a need of bringing revolution in the area of science and technologies, which could help easily in repetitive tasks which we perform daily and also giving consideration to the intensity of the labour required and improving qualities to its optimum level. Existing vacuum cleaner systems equipped with limited suction power. They are costly, complex. Vacuum cleaner were manual. There are already several big bulky cleaning machine available in the market which are capable of cleaning the remote area which are not in the reach. The need of designing new technology based vacuum cleaner which could overcome the short coming of existing vacuum cleaner also provide a new facilities of vacuuming sanitizing using UV light. They need to be work manually because they were not automated. Vacuuming is one of the most hated chores in existence. It is laborious, monotonous and boring and in today's fast-paced society it is simply too time consuming. For many peoples buying a robot vacuum is a wonderful way to clean their home without devoting large amount of time and energy. Robotics vacuum are small usually small shaped appliances that help to clean your Home. They are available every price point. With the prices are decreasing as the technology continues to develop.

II. REVIEW OF LITERATURE

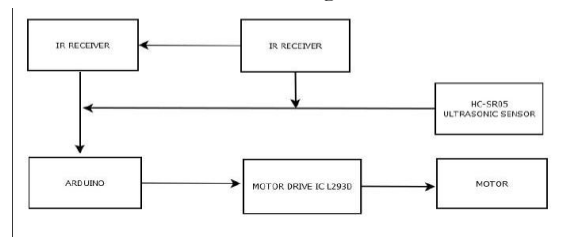
A robotic vacuum cleaner is an autonomous electronic device that is intelligently programmed to clean a specific area through a vacuum cleaning assembly. Vacuum cleaner which could smartly avoid obstacles. Some of the available products can brush around sharp edges and corners while others include a number of additional features such as wet mopping and UV sterilization rather than vacuuming. The idea is inspired by the famous vacuum cleaner Robot Roomba". The vacuum Cleaner is the most important part in placement of Robot. It has to be placed at tilted angle, so that it can provide proper vacuum action. Once you power on the robot the vacuum is also turned on.

The arduino is the main processing unit of the robot out of 14 available digital input output pins 6 pins are used in this project design. US sensor has 4 pin (vcc, trig, echo and ground). Vcc , gnd are connected to the supply pin of arduino, trig is connected to 11th pin of arduino ,Echo is connected to 10th pin of arduino. The L293D is a 16 pin motor driver IC pin 1 and 9 are enable pin. They are connected to VCC. Pin 2 and 7 are control input pin of motor driver IC L293D for 1st motor. They are connected to pin no 9 and 8 of arduino respectively. Similarly pin no 10 and 15 are control input to 2 motors. They are connected to pin no 4 and 3.and pin no 4, 5, 12, 13 are ground pin of L293D are connected to arduino ground pin. 1st motor is consider as left wheel is connected across pin no 3 and 6 of L293D. 2nd motor which act as right wheel is connected to the 11th and 14th pin of L293D .16th pin of L293D is VCC is given to 5V of supply of arduino.

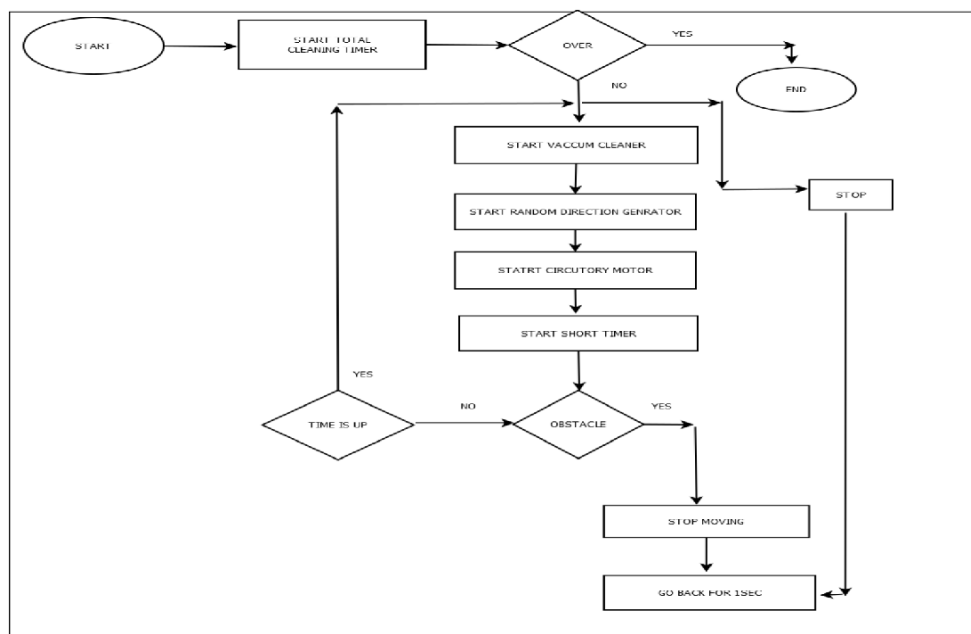
III.METHODOLOGY

When the robot is powered ON, both the motors of robot will run normally and the robot moves forward. During this time the US sensor continuously calculate the distance between the robot and the reactive surface. This information is processed by the arduino, if the distance between the robot and the obstacle is less than 15cm the left wheel motor is reversed in direction and right wheel motor operate normally. This will rotate the robot towards right. This rotation continues until the distance between the robot and obstacle is greater than 15cm.This process continues forever and the robots keeps on moving without hitting any obstacles The motors with motor driver IC(L293D)which will be able to supply 1A supply hence this driver will get the information from arduino and makes the motor work as desire The US can be fixed to DC servo motor and only US rotates according to servo motor which is based on the distance, the entire robot rotates.

Block Diagram



Flowchart



IV. FUTURE SCOPE

We can use our system at public places. As well as railway station, bus stations, crowded areas. Our system is helpful for people who are busy and don't have enough time.

V. CONCLUSION

There are different types of vacuum cleaner are available now a days. But all these systems are useless without user cooperation also consume a lot of time. So we have designed this system which is automatic.

References

- [1] Abdul Basit Zia, "Smart Floor Cleaning Robot", HUK, 2015.
- [2] Yusuf Abdul labi Badamasi, "The Working Principle Of Arduino", NTNN, 2014.
- [3] Alessio Carullo and Marco Parvis, "The Ultrasonic Sensor For Distance Measurement", 2001.
- [4] S.Huda "Speed Control For DC Motor With PWM Method Using IR Sensor" IEEE, 2014.
- [5] Sachin T.Bagde "A Review On Design Of Automated Floor Cleaning System" IEEE, 2015.