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# VACUUM CLEANER ROBOTIC CAR

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**Abstract**-The main objective of this project is to improvise the vacuum cleaner to more effective way of cleaning. This project present and illustrate the controlled vacuum system and robotic car that is combining together to be an automatic and autonomously vacuum cleaner robotic car. The project consists of both software and hardware design where the ultrasonic sensor as the input to sense the obstacle, the Arduino UNO is used as the controller to the circuit, and motor driver as the output to move a DC motor of robotic car freely. This motor driver is used to move a DC motor of Robotic Car freely. The vacuum system has been included within the robotic car and got a switch ON/OFF near the vacuum. As a conclusion, this project exactly will give such an easier way to be handle and taking just a little bit of time for house duties.

**Keywords** – Arduino UNO, Motor driver, DC motor, Ultrasonic sensors, vacuum cleaner, chassis.

## INTRODUCTION

The project is designed with one mode which is automatic and autonomously to clean spaces such as room, walking areas and eating places. The users can choose either to use the robot automatically or manually in order to make user's life become easier. This project consists of Arduino circuit as a microcontroller, ultrasonic sensor to determine the distance and obstacle, motor drive and vacuum circuit. It is a type of small design and suitable to apply at tiny spaces and hard to reach places such as under the work desk, bed, and narrow areas. This project also use a few powerful DC motors. Its operation is for the movement of two tires, then a small vacuum and also a motor for vacuum to clean up with the help of fast and strong fan made up by blade inside it. In addition, the prototype uses 3 batteries as a power source to control the vacuum cleaner, DC motor and Arduino. Even it is only for a few hours, it is rechargeable by charging the batteries into a socket or plug as a power supply.

## METHODOLOGY

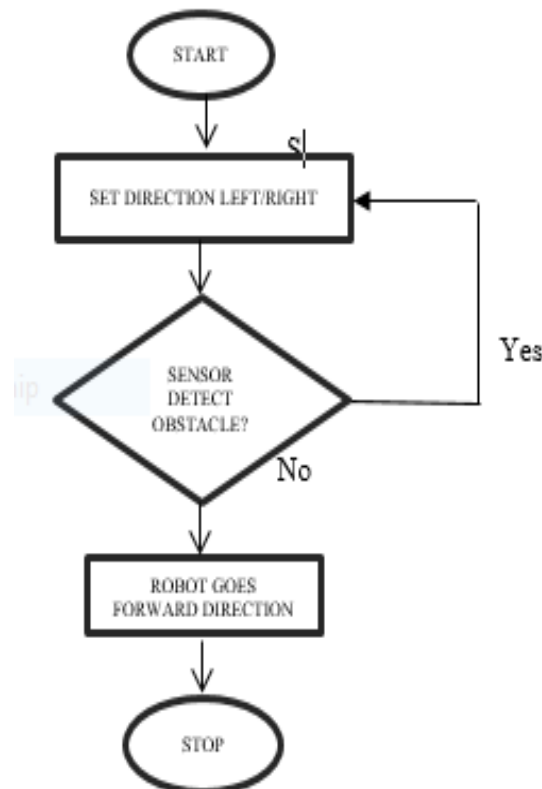


Figure 1: Flowchart of the Vacuum Cleaner Robotic Car

The flow chart of the project is shown in Figure 1. The direction will be set either left or right by the user then the car will move forward as have been set up. Whenever there is any obstacle forward, the car automatically will change either it is right or left. The car will be stop after it moves forward again. The car will keep moving based on this flowchart without having any trouble.

## RESULT AND DISCUSSION

Figure 5 shows the vacuum cleaner and the robotic car being tested. The vacuum and the car are separated where the vacuum is put on top of the car. Two push button will start each the robotic car and the vacuum cleaner. The project consists of three circuits which is circuit for Arduino, motor driver (L298N) and three ultrasonic sensors. We put three ultrasonic sensors in front, right and left of the car to detect any obstacle in such a specific distance that have been put in coding. For this project, we will be using Arduino UNO and the Arduino programming software to run our robotic car to determine the directions of the wheel. Also, we use a bigger and more powerful DC motor for the vacuum fan as it have more power to catch the dust faster and easier. For the power supply, we used three of it, two 9V batteries for the vacuum cleaner and the DC motor, and also one 9V battery connected to the Arduino.

## CONCLUSION

As a conclusion, this vacuum cleaner is designed with autonomously and automatic control of robotic car. This project is mainly to give comfort to other people in cleaning a space or difficult spot to reach without using human force. The idea of this project is to automatically clean up the space in a more efficient and faster than vacuum cleaner. A few adjustments has been made by adding ultrasonic sensors to detect the obstacles and automatically avoiding them for the purpose of easy maintenance. For future recommendation, this project can be improved by controlling the ON/OFF button vacuum cleaner using smart phone.

## REFERENCES

- [1] Ali Okatan and Georgi M. Dimirovski "Fuzzy Logic Navigation and Control Of Non-Holonomic Vacuum Cleaner", Proceeding Of the 10th Mediterranean Conference on Control and Automation, July 2002.
- [2] D.C. Patel and H.S Patil "Design and Development of Low Cost Intelligence Vacuum Cleaner" International Journal of Recent Trends in Engineering and Research, Vol.03, Issues 11; November-2017.
- [3] Yi Song Park and Young Pung No, Remote Controllable Automatic Moving Vacuum Cleaner, 1998.
- [4] Alexander Smirnov, Alexey Kashevnik and Andrew Ponomarev,"Multi-Level Self-Organization in Cyber-Physical-Social Systems:Smart Home Cleaning Scenario"7th Industrial Product-Service Sytems Conference-PSS, Industry Transformation for Sustainability and Business, SPIIRAS, 39, 14 line, St.Petersburg, 199178, RussiaITMO University, 49 Kronverksky Ave., St.Petersburg, 197101, Russia.  
Iwan R., Ulrich Francesco and Mondada J.-D. Nicoud, "Autonomous Vacuum Cleaner" Laboratory of Microcomputing (LAMI) Swiss Federal Institute of Technology