

# Varaha Floor Cleaning System

**Tejal Dadas**

*Department of Electronics  
Sardar Patel Institute of Technology Mumbai, India*

**Payal Shah**

*Department of Electronics  
Sardar Patel Institute of Technology Mumbai, India*

**Pooja Khismatrao**

*Department of Electronics  
Sardar Patel Institute of Technology Mumbai, India*

**Manisha Bansode**

*Department of Electronics  
Sardar Patel Institute of Technology Mumbai, India*

---

## **Abstract**

*Cleaning the floors in universities, hospitals, air ports, theatres, retail malls, and factories is the goal of this effort. The goal of this project is to design and build a machine that can clean both wet and dry floors. It can be used to clean both dry and damp floors. Maintaining clean floors is crucial for maintaining our health, and this floor cleaning machine makes the work simpler. As a result, this initiative is quite beneficial in today's world. This machine's straightforward build and design make it simple for anyone to use. The floor cleaning device consists of an AC-to-DC converter, a foam rolling brush, and a DC motor. The goal of this project is to provide a more modern technique for cleaning wet and dry floors. Our main objective is to lower the cost of the existing equipment on the market. Our brand-new machine is now much cheaper than previous models as a result. Our device simply needs a very small amount of electricity as an input compared to other floor cleaning devices that are already on the market. It is less maintenance-intensive and easy to operate.*

**Index Terms:** *floor cleaning machine, Control system, motor wheel system, Bluetooth, Manual control, Power status indications, Power controls, Power efficient*

---

Date of Submission: 07-08-2023

Date of Acceptance: 17-08-2023

---

## **I. INTRODUCTION**

The main goal of this project is to automate floor cleaning duties using a motor source. Less labour is needed, and the cleaning procedure is more consistent. Because it is automatic and portable, larger places like auditoriums and halls may be cleaned with it. Cleaning only takes a very brief amount of time and costs a very small amount of money. A variety of handcrafted gadgets were traditionally used to mop the floor by hand in the past. As time goes on, science advances, and a variety of cutting-edge cleaning methods are used. The earliest of these was a brush that would move back and forth when muscles were applied firmly. The brush design may occasionally alter based on the floor structure and the convenience of the cleaning team. Before electricity was invented, Hoover cleaners were made to clean dry surfaces. We are all aware of how time-consuming and labour-intensive physical cleaning is. Then the concept of a Varaha robot appeared. Varaha robots are those that can move about in their environment and are not limited to a certain physical space.

## **II. OBJECTIVES OF THE PROJECT**

### *A. Background of Invention*

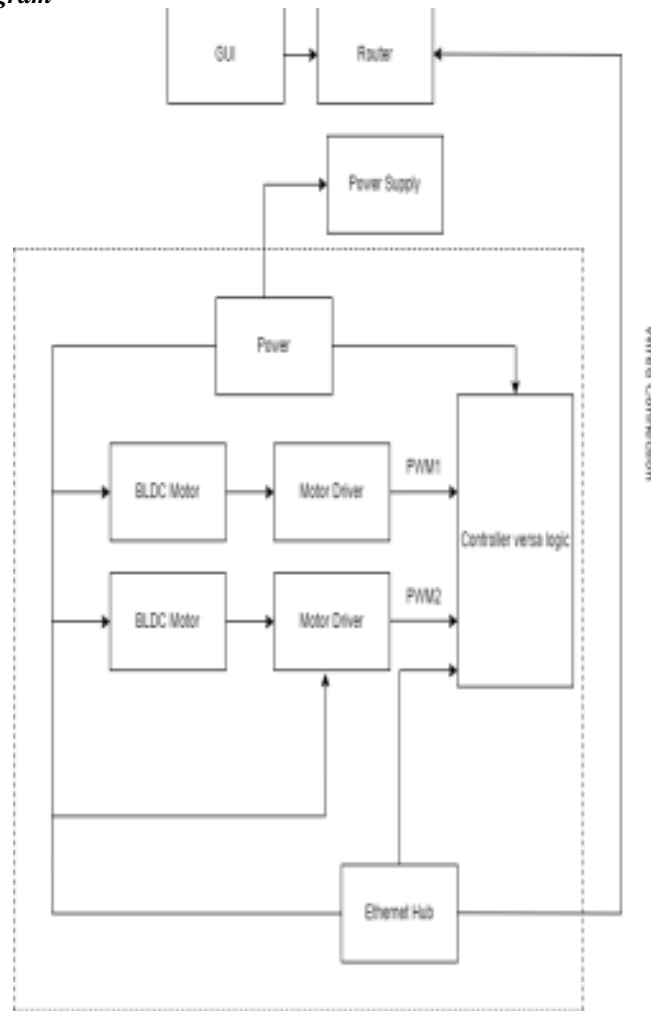
Currently, it is rather common to find robots that can clean floors on their own. These contemporary devices are built to operate without human assistance. These devices have also been programmed to function efficiently and precisely when performing their functions. The types of floor cleaners have evolved over time. A navigation and control application is available for these gadgets. The Samsung Jet bot, Eco-Vac OZMO, Eufy RoboVac, and Roomba iRobot are just a few examples of the commercial items that have taken over the market. However, many families, especially those from lower socioeconomic groups, still find these to be out of their price range due to their exorbitant costs.

*B. Idea of Innovation*

By presenting a working cleaning robot prototype that could one day be turned into a low-cost robot with the majority of the functions offered by commercial robots, our study aims to close this gap. To create these kinds of robots, numerous research projects have recently been carried out. In order to increase robot response, experiments were conducted with contemporary microcontrollers, sensors, actuators, and motors. For home use, a portable sweeping, vacuuming, and wiping robot was suggested. Throughout development, the robot's main CPU was an Arduino Uno. The ecosystem of the home and the interaction between humans and machines were also investigated through the employment of a cleaning robot in the home. Reference [5] provides research on the use of the Roomba robot at home. The authors focused on how attitudes towards robots and the Roomba have evolved, as well as how the Roomba fits into the home environment and how housekeeping has changed as a result. The study offered fascinating new data regarding domestic robot interactions. Other academics have also added to the information discovered through the integration of robotic Hoover cleaners into the home ecology. The survey's findings demonstrated that users' impressions were not properly taken into account when designing the robot. This resulted in the robot being rejected because of ecosystem incompatibilities among the users. The results of the simulation were very convincing.

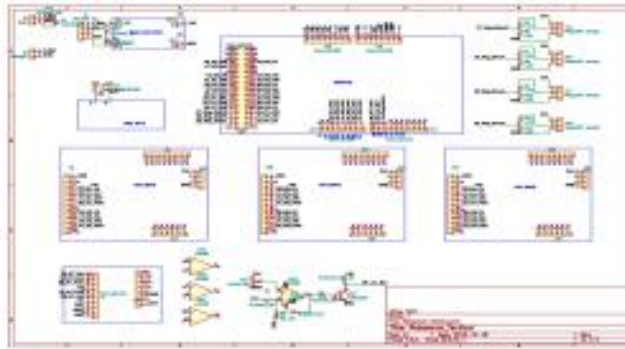
**III. SIMULATION RESULTS AND DISCUSSION**

*A. Hardware Block Diagram*



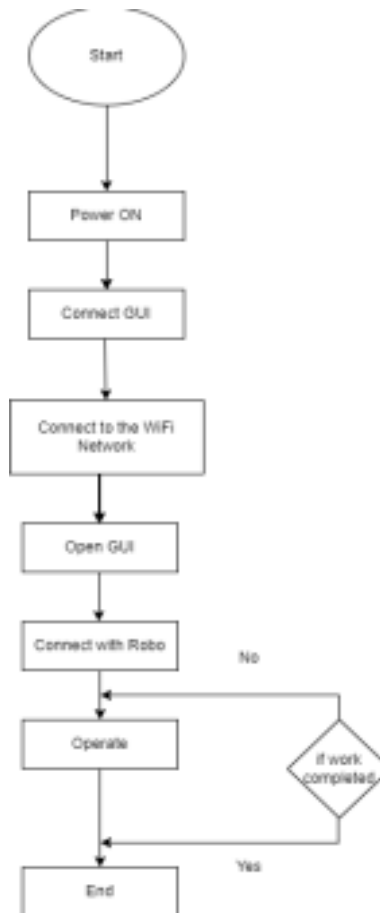
**Fig. 1. Block diagram of Hardware Layout for the Varaha floor cleaning system**

**B. Proposed Methodology**



**Fig. 2. Schematic design for the Varaha floor cleaning system**

**C. Operating Process**

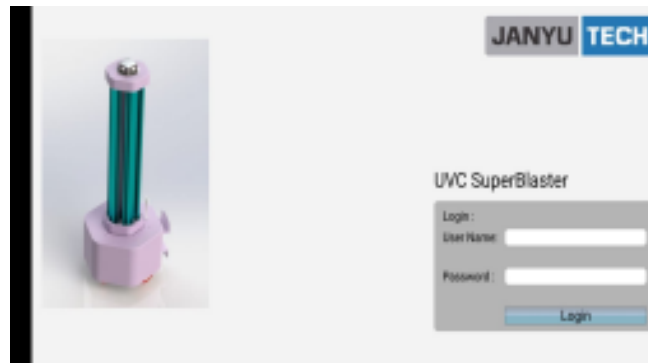


**Fig. 3. Flow chart for the operating process of the Varaha floor cleaning system**

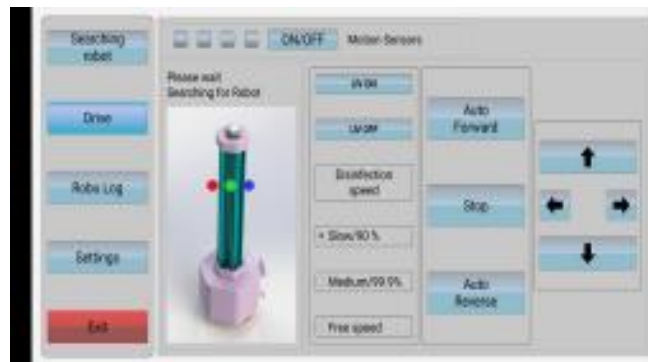
**IV. RESULTS AND ANALYSIS**

We control the robot using the created software, and we also make use of the flowchart to help us utilise and control the robot.

*A. Developed Software*



**Fig. 4. Login Page**



**Fig. 5. Operating Page**

*B. Developed Hardware*



**Fig. 6. Top View**

**V. CONCLUSION**

The effectiveness of floor cleaning is increased by innovative technology, which also significantly reduces costs and eliminates the need for human labour. Floors may be cleaned more frequently with less labour needed, enhancing general cleanliness and fostering good health. When the prototype was tested on a floor, it cleaned the floor more effectively



**Fig. 7. Side View**

automatically than manually. The amount of human labour required to clean large areas can be reduced by employing this automatic floor cleaner. The purpose of this project is to automate and streamline the floor cleaning process.

Its construction was aimed at providing simple cleaning at a reasonable cost while also being flexible in operation. All ages of users may easily operate this machine thanks to its user friendly design and construction. As a result of the automation, the machine can run without constant human supervision. This project, "VARAHA AUTOMATIC FLOOR CLEANING MACHINE," was developed with the hopes that it would be very cost-effective and helpful for workplaces, workshops, and residences.

### FUTURE SCOPE

The objective is to develop a fully autonomous cleaning machine that can operate on a range of environmentally acceptable energy sources, such as solar or wind energy, and handle a variety of cleaning tasks. With time, the impact of this and other modest technology advancements will grow, benefiting India as a whole.

### ACKNOWLEDGMENT

We have great pleasure in presenting the report on the "Varaha Floor Cleaning System". We also take this opportunity to express our sincere thanks to our guide Manisha Banode, Associate Professor of Electronics Engineering, S.P.I.T., Mumbai, for providing the technical guidelines and suggestions regarding the line of this work. We would like to express our gratitude for their constant encouragement, support, and guidance throughout the development of the project. We also thank all the staff of S.P.I.T., Mumbai, and Janyu Technologies, Mumbai, for their invaluable help rendered during this work. We wish to express our deep gratitude to all our colleagues at S.P.I.T., Mumbai, for their encouragement.

### REFERENCES

- [1]. J. Forlizzi And C. Disalvo, "Service Robots In The Domestic Environment: A Study Of The Roomba Vacuum In The Home," In Proceeding Of The 1st Acm Sigchi/Sigart Conference On Human-Robot Interaction - Hri '06, 2006, Pp. 258-265.
- [2]. Ajay P John- "Implementation Of An Automated Smart Robotic Floor Cleaner". B. Tech Student, Dept. Of E.C.E., Hkcet, Pampakuda, Ernakulam, India.
- [3]. T. Jayananda Kumar, Et. Al. (2020). Design And Fabrication Of Wet And Dry Floor Cleaner With Iot Based Control. Journal Of Emerging Technologies And Innovative Research, 7, 1070- 1075.
- [4]. Brochure, Sludge Cleaning Services, "See Sch", Janyu Technologies Pvt Ltd Company, Mumbai, 2014.
- [5]. Avinash Chahare, Et. Al. (2022). Design Modification And Fabrication Of Eco-Friendly Cleaning Machine. International Journal Of Advanced Research In Science, Communication And Technology, 2, 750-756.
- [6]. Brochure, Uv Disinfection System, Janyu Technologies Pvt Ltd Company, Mumbai, 2014.
- [7]. Rupali Shinde, Et. Al. (2020). Automatic Floor Cleaner With Uv Disinfection System. International Journal Of Advance Research And Innovative Ideas In Education, 6, 564-569.
- [8]. H. Rashid, A. Mahmood, S. Shekha, S. M. T. Reza, And M. Rasheduzza Man, "Design And Development Of A Dtmf Controlled Room Cleaner Robot With Two Path-Following Method," In 2016 19th International Conference On Computer And Information Technology (Iccit), 2016, Pp. 484—489.
- [9]. Andrew Ziegler, Duane Gilbert, Christopher John Morse, Scott Pratt, Paul Sandin, Nancy Dussault, Andrew Jones, "Autonomous Surface Cleaning Robot For Wet And Dry Cleaning," U.S. Patent 7389156 B2, June 17, 2008.
- [10]. Andrew Ziegler, Christopher John Morse, Duane L. Gilbert, Jr., Andrew Jones, "Autonomous Surface Cleaning Robot For Dry Cleaning," U.S. Patent 8782848 B2, July 22, 2014.
- [11]. Manya Jain, Pankaj Singh Rawat, Assist. Prof. Jyoti Morbale, "Auto Matic Floor Cleaner", International Research Journal Of Engineering And Technology (Iret), Volume: 04 Issue: 04 , Apr -2017, E-Issn: 2395 -0056, P-Issn: 2395-0072
- [12]. G. Muralidharan, "Design And Development Of Cleaning System", International Journal Of Soft Computing And Artificial Intelligence, Issn: 2321- 404x Volume- 1, Issue- 1
- [13]. Jens Steffens Gutmann, Kristen Culp, Mario E Munich And Paolo Pirjanja, "Social Impact Of A Systematic Floor Cleaner" .Published By Advanced Robotics And Its Social Impacts (Arso), 2012 Ieee Workshop On May 2012 Doi:10.1109/Arso.2012.6213398
- [14]. Liu, Kuotsan I, Wang, Chulun, A Technical Analysis Of Autonomous Floor Cleaning Robots Based On Us Granted Patents, European International Journal Of Science And Technology.