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ARDUINO AND BLUETOOTH BASED LOW COST PROTOTYPE MODEL FOR SYSTEMATIC FLOOR CLEANING

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Abstract. Germs will start their work once there is any kind of dust. In order to make the residence as well as industry floors dustless this paper explores the functioning method of a floor cleaner which significantly keeps healthy environments. It also gives a motivation with increase enjoyment by making direct removal and floor cleaning, two in one model. Prototype model was tested and is effective with less maintenance and long lasting. As people are working both in office and at home this type of residential floor cleaner will be a precious time saver. The strength of this model is that it keeps the floor clean and can be operated much simpler than manual cleaning.

Keywords: *Arduino, Floor Cleaner, Bluetooth based, Prototype Model, Hygienic.*

Introduction

Nowadays everyone in this world gives the first priority to neat and clean. Cleaning the floor inside the house or outside is very important to stay healthy and wealthy. Like washing machines, televisions and refrigerators, floor cleaners are essential appliances in modern society [1]. Around two million tones are discarded every year on electrical and electronic component by companies. Waste reduction agenda is a very good approach to make good product for longer lifetime [2]. In UK 44% households regularly replace vacuum cleaner [3]. In 2012 28 % vacuum cleaners were replaced, this is reported in [4]. Effective cleaning and sanitizing helps directly or indirectly to protect human health. Better life time means that it must be a suitable clean performance in any environment and it should be economical for all scenarios.

In the advanced technology, many activities now become automated and easily operated by Bluetooth as it is emerging wireless technology [5]. Nowadays starting from children to old age people can easily operate the floor cleaning machine through a smart phone. As well as the size is very portable, so any displacement can easily be possible. In this paper we emphasize the Bluetooth can be used for a floor cleaning system and is suitable for people of all ages and very useful in hospitals, houses or in industries.

As in case of larger floor area like in office and in industry a lot of workers are involved to complete the floor cleaning task. So we can introduce such cleaner to make the cleaning work more effective and efficient. This is also cost effective and less manpower is required. Because nowadays the prime requirement for the common areas should be

reducing interior floor dust. The prime focus is to reduce the burdens of life time with maximum benefits from this floor cleaner.

Procedure for proposed system

The figure 1 describes the proposed system for innovative floor cleaning system. As the overall system consists of four important roles like water dropping, brushing, wiper and air blower. Figure 2 shows the different components connection while the wired hardware implementation connection is shown in figure 3. The bottom view of the brush connection is shown in figure 4 and the full skeleton of the model is in figure 5. In water dropping system water tank is connected to horizontal holed pipe through water pump. When the main switch is ON water from the tank is dripped out, 2 brushes are connected to rotating 12V 500RPM motor. After water dropping, these 2 brushes wash the floor. These 2 brushes are continuously rotating to wash the floor.

Water is dripped out like irrigation system. The 30cm wiper is fitted to wash the wet floor. Because of this wiper, it wipes out the floor deeply. The main and unique compartment of the prototype model is the air blower which is fixed up with 775 motor and is fitted to model which will desiccate the floor deeply.

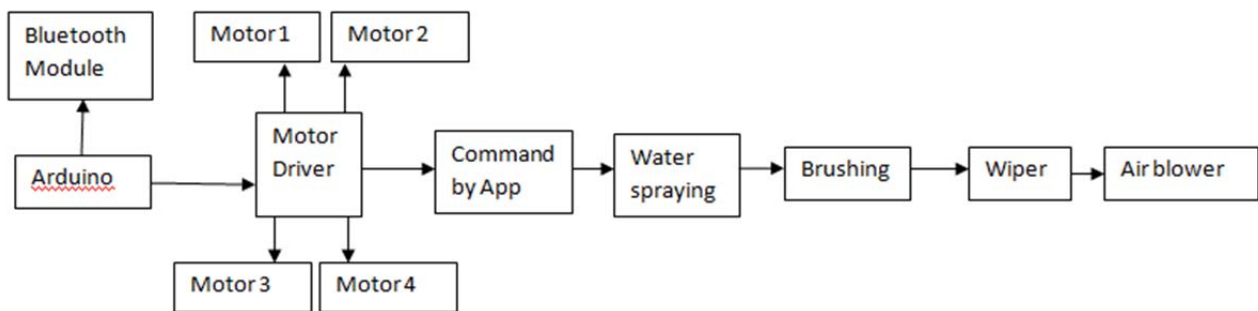


Figure 1. Block diagram of proposed system.

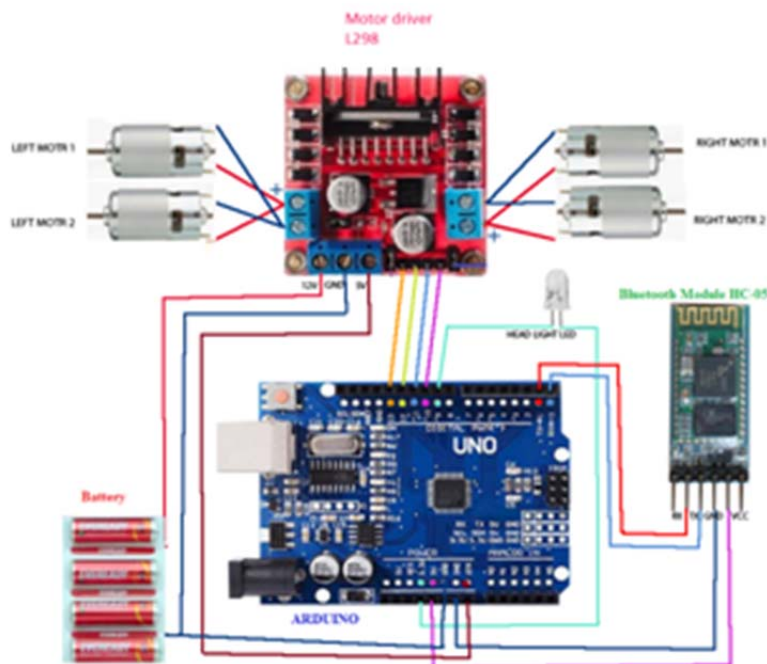


Figure 2. Different components used and its connection in proposed system.

System Design

Motor drivers supply the exact required power to the motors. It is a high voltage twin H-Bridge factory only settle for commonplace TTL voltage levels. It drives forward and reverse to perform with speed management like DC Motors, and Stepper Motors. The L298 accepts TTL inputs [6]. High performance can be achieved through brushless dc motor and it performs well in controlling properly the vehicle [7]. Just like raspberry Pi [8], Arduino provides smart performance. Using Bluetooth, smartphone can monitor and control anything easily [9]. Arduino Uno has fourteen input/output digital pins and out of that six are PWM outputs. For every application on internet there should require security [10]. Even in medical field Robot Assisted Surgery using HC-05 Bluetooth Module [11]. The HC-05 module has six pins named as GND, Vcc, Key, TX, RX and LED. It will work as master and slave mode. After proper establishment of connection it can receive and transmit data according to the selected mode. Bluetooth chip has been used with Arduino which will reduce the manual floor cleaning. Pairing between Arduino and Bluetooth module is through mobile app i.e. Android app which will control the Bluetooth module and Arduino uno. C language, which is used for Arduino and it is easy to implement. Arduino uno is the complete package with a software burner, 5V regulator and a microcontroller, also Arduino gives readers, designers and researchers flexibility like to easily use each and every function the readymade available programs by downloading them from the Arduino website [12]. The entire cleaning function can be handled with the Android mobile with wireless Bluetooth module as functioning the system and reduce the manpower requirement.

There are different reasons for floor cleaning like as the prime parameter is to remove dirt, obstructions and strains. Secondly, to remove sand and grit which scratch and wear down the surface. Finally, to maintain an optimum traction and lastly proper environment sanitary. The indoor environment is the most important area for the human life. As adults and children spend more time inside homes, schools, offices [13]. Sometimes houses with some small kind of dust also can be toxic and become promoters of diseases. As compared to adults, younger children can be earlier and heavily effected by cardiovascular disorders due to dust particles. As small children have ingest significant of dust because of frequently taking their hand-to-mouth activity it could make disorders in brain growth [14]. To avoid all above, frequent house cleaning should be required in apartments, residents, schools, offices, industries. In Hospitals, Industry and in homes, it is recommended to reduce the effect of bacteria and for this proper floor cleaning must be required. Proper floor cleaning can control these effects and decrease its spreading. Here we have implemented spray, moist and wet mapping, which are the primary requirements and effective to reduce bacteria and clean the floor perfectly. Most of the occupants and all customers or any relatives were most satisfied with good cleaning. For this also suitable flooring is an important factor in the building. Little mobile guidance will help in monitored or one can say audited the cleaning work.

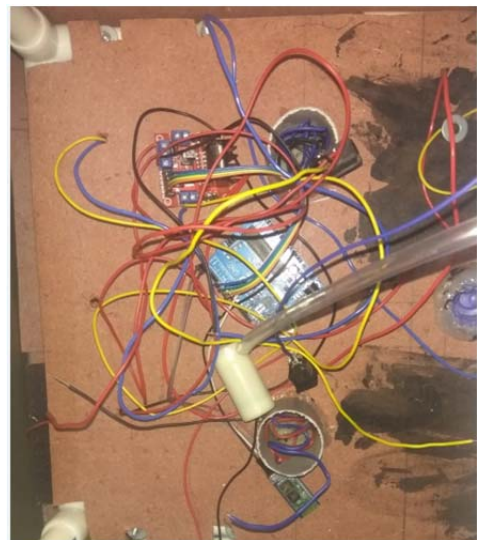


Figure 3. Circuit connection of proposed system.

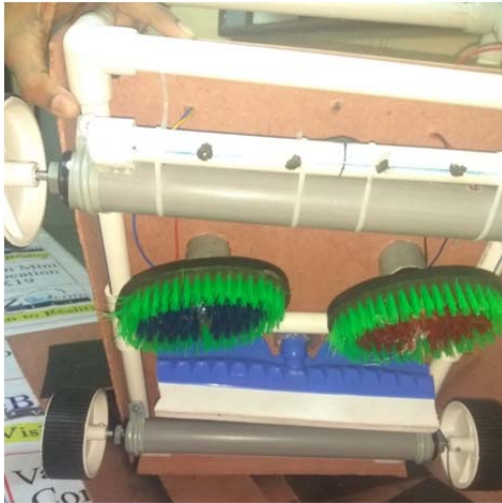


Figure 4. Bottom view of brush connection.

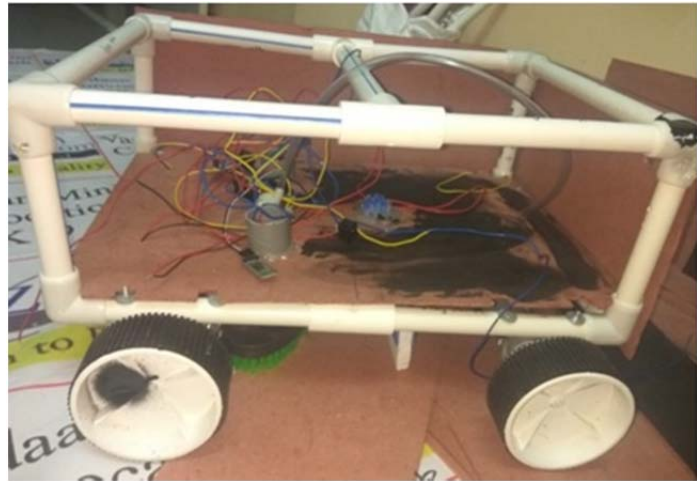


Figure 5. Skeleton of proposed model.



Figure 6. Side view and front view of prototype floor cleaner system.

Discussions

Effective cleaning also needs some parameters like cleaning equipment which needs to be in good condition, cleaning technique must be in correct way, the person or staff should know the procedure how to operate it. Also the same task may slightly vary in time because of the different types of flooring. Factors to consider while utilizing any kind of cleaning system as size of space to be cleaned because the entire house, a small apartment is different if you have to clean the stair parts of the building, also the noise while operating, Storage also makes the system bulky and determines the cleaning capability. Nowadays most of machines are easily operated just like automated with advance technology and easily handled with the IOT platform.

Conclusions

The routine based on regular cleaning will make the environment healthy and safety. This study attempted to inform that one can easily clean the floor with the help of mobile and Bluetooth module. With the current market scenario this automated type floor cleaner will provide the best functionality and make more comfort in the cleaning process. Without depending on human cleaning efforts, proposed floor cleaner makes the life easier within the cleaning process. This type of cleaner will have more features and requires to be applicable to industries as well as in hospitals. Properly cleaning activities will also prevent

from different infections. Workers from different occupations perform the cleaning job easily. As the cleaning task is frequently a requirement as well as manpower for this cleaning work requires long time, the proposed floor cleaner system will have the potential to come over and be a very good healthcare product. So one can go for this system cleaning activity and get benefited from its cleaning potential. Specifically it will help physically more disabled individuals.

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