

INTELLIGENT ROBOT

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Abstract- With the advancement of technology robots are getting more attention of researchers to make life of mankind comfortable. This project presents the design, development and fabrication of prototype smart lawn cutting, Floor Cleaning and pick and place application. This project provides practical approach towards building such robot which will work automatically.[6] Used Android technology for manual control which is an extra feature not available in original Roomba.[7] The following robot is first of its kind as added extra features which will reduce the tedious process of floor cleaning, pick and place as well as lawn cutting. Used IR-sensors to detect obstacles like walls and edges and prevent the floor cleaner robot from hitting the objects in front. It's compact enough to clean the tightest corners.[7] Used sharp cutter to cut the lawn as per requirement and also used Arm for pick and place any object.

KEYWORDS: ARM , Smartphone

1. Introduction

Designed Robot which is equipped with an automatic robot to clean the floor, pick and place and lawn cutting applications by using ARM LPC2148 to control all the movement.

1.1 Introduction

Floor Cleaner: One of the basic requirements at household is cleaning which is an iterative process and required on daily basis consuming both time and energy. Cleaning Robot is an approach to make cleaning an easy and time efficient task also to give comfort to the human by doing the domestic works. The robot will be placed in the corner of a dirty room with a fully charged battery and power supply. It will progress throughout the room, beginning from the outer perimeter and ending in the center of the room. If an object is obstructing the path of the robot, it will detect and avoid with the use of its sensors.

Pick and Place: The pick and place robot is a microcontroller based mechatronic system that detects the object, picks that object from source location and places at desired location. For detection of object, infrared sensors are used which detect presence of object as the transmitter to receiver path for infrared sensor is interrupted by placed object.

Lawn Cutter: Moving the lawn with a standard motor powered lawn mower is an inconvenience, and no one takes Pleasure in it.[4] The sliding blades are provided to cut a lawn at an even length. It is used to maintain and upkeep lawns in gardens, schools, college's etc.[8]

In the implemented ROBOT some changes are done in the existing machine to make its application easier at reduced cost. Our main aim was to control pollution control. Unskilled person can operate easily and maintain the lawn very fine and uniform surface look.

1.2 Objective

- a. To interface ARM7LPC2148 with Bluetooth through android Application.
- b. To provide an application for Floor cleaning.
- c. To provide an application for pick and place.
- d. To provide an application for lawn cutting.

2. LITERATURE REVIEW

The mint cleaning robot which is an automatic cleaning robot that sweeps and mops hard-surface floors using dusting and mopping clothes was developed. It investigates the product's social impact with respect to the attitude of the customers towards a systematic floor cleaner and how such a robot influences their lifestyle. Systematic cleaning was an important feature, and modifications to the environment to support the navigation of robot. The robot employs a systematic cleaning strategy that maps the environment using a GPS-like indoor localization.

In the system a humanoid robot is been implemented which performs the task initiated by the user without human assistance by voice input using HM2007. The pick and place robot which is been implemented eliminates the need of sensors which is used to detect object and hence object detection application is developed that is programmed in java language. Wireless charging is been implemented that works on principle of electromagnetic induction. In this whenever the onboard battery of robot goes below the threshold level then the robot will move towards recharging station to charge itself.

The lawn mover was fabricated in 1830 by Edwin Beard Budding, an engineer from Stroud, Gloucestershire, England. He attained the idea after observing a machine in a local cloth mill which used a cutting cylinder (or bladed reel) provided with a support on a bench to trim cloth to make a smooth finish after weaving. Budding executed that an identical concept would enable the cutting of grass if the mechanism could be mounted in a wheeled frame to make the blades to spin close to the lawn's surface.



Fig 1(a): Floor Cleaner[



Fig 2(b): Pick and Place



Fig2(c): Lawn Cutter[3]

3. ARCHITECTURE

This is an interface of hardware and android application. ARM7 is used as a main hardware control unit to the interfacing devices with the motor and serial communication. An android application acts as a remote control unit for the robot. Both hardware and android application interface through Bluetooth module.

The proposed ROBO is provided with a mob to clean the floor and a cutter for cutting lawn. A BLUETOOTH module is a serial communication device which is connected to transmitter and receiver pins.

While starting an android app it connect Bluetooth connection an command hardware to drive the motor according to the operation performed on android app. Every action on android app display is sent as a command to hardware to perform it. Bluetooth provide a wireless control to the robot. This communication is done through serial communication data format, which sends start bit, 8 data bits and a stop bits in the data format.

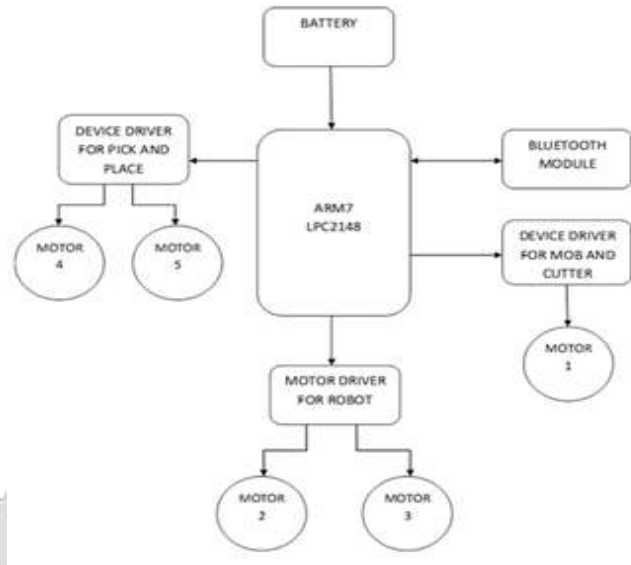


Fig 2 Block Diagram

4. Future Scope

In future User can operate this robot from remote location if it is provided with video surveillance and net connectivity. It can be operated using WI-FI connectivity. In addition to this image processing can be done using video camera in the ROBOT.

5. Result

Figure(3) shows the designed robot and Screen on android while App is in use. At the front side a mob is placed for floor cleaning and below that a sharp cutter is attached for lawn cutting. At back side of robot an arm is given for pick and place of an object. When user want to operate the robot he should have to open an android app in the mobile phone. The first screen shows the three options and according to choice user will select application. Movement of the Robot can be done by selecting the options displayed on the screen as shown in the figure(5C).

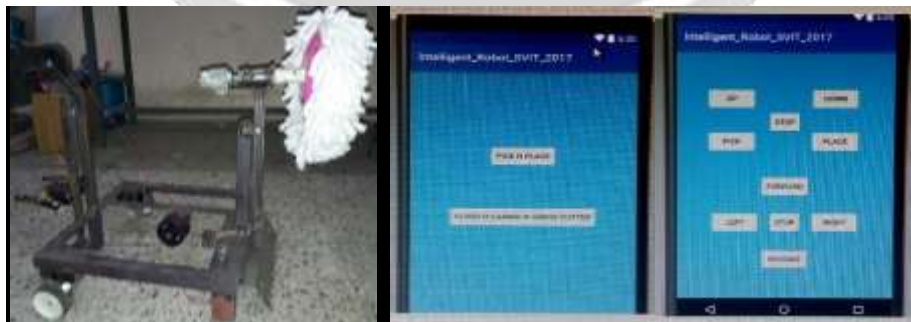


Fig.3(a) Photograph

Fig.3(b) App Screen 1

Fig.3(c) App Screen 2

6. Conclusion

Implemented & designed autonomous robot features adjustable gripper to perform pick and place, Cutter for lawn cutting and mob for floor cleaning operation. It provides multiple applications & have good performance.

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