Floor cleaning robot

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Abstract— Manual work is taken over the robot technology and many of the related robot appliances are being used extensively also. Here represents the technology that proposed the working of robot for Floor cleaning. This floor cleaner robot can work in any of two modes i.e. “Automatic and Manual”. All hardware and software operations are controlled by PIC16F877 microcontroller. This robot can perform sweeping and mopping task. RF modules have been used for wireless communication between remote (manual mode) and robot and having range 50m. Five motors are used, one for cleaning and four for wheels. L293D motor driver is used to drive the motors for wheels. In manual mode, RF module has been used to transmit and receive the information between remote and robot and display the information related to the hurdle detection on LCD. The whole circuitry is connected with 12V battery.

1. INTRODUCTION

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as human now a days. Mostly an average human uses 2-3 robots per day in his day to day life. Actuators are used for controlling a mechanism which ultimately controls a part of the device. Sensors are the sensing devices which transmit a signal and receives the signal and accordingly used to accumulate the various environment information which is ultimately fed to microcontroller for deciding the working of machines. Microcontroller is the brain of robot where program is written and sensors are connected as input and actuators as output. The controlling of the robot is governed by various algorithms like fuzzy controller, machine learning based practices and artificial neural network based algorithms.

Depending upon the environment value received to the controller it eliminates the error and transits from one state to another. Basically there are two types of controllers, one is continuous controller and another is PID based controller. Continuous controller is more direct and less effective while PID controller is more advanced and varies according to the current state and gives efficient result. Robot Cleaner is a machine that can clean the surface or floor automatically. Its capable to clean the floor in such area where we are not able to go i.e. blow badly or sofa or any corner etc. In Robot Cleaner for Cleaning a surface or floor we use vacuum cleaner. For make more accurate we use 4 sensor pair in Robot Cleaner. One if for left side, one is for right side, one is for down (for sense stairs, etc..)and one pair infront is important to detect obstruct. Stepper motor is used for run robot cleaner. A study of robotics means students are actively involved in these disciplines in a problem solving ambience.

EXISTING SYSTEM

• The existing system was made by wired system
• That was more critical and not effectives.
• Not reliable and accuracy is poor

PROPOSED SYSTEM

Our proposed system is based on wireless communication.

• No need of extra wires so our system requires low components and circuit is simple.
• Operating process is simple.
• Not expensive.

The aim of this project is to develop an autonomous robot that can move itself without continuous human guidance. The autonomous cleaner robot consists of low power consuming electronic components and it can operate at very low power. Electronic parts are the controller board Arduino, Ultrasonic sensors, voltage regulator IC and motor driver circuit. Mechanical part is motor with gearbox arrangement. Ultrasonic sensors will detect obstacles according to the program being implemented. A 12V, 4.5Ah lead acid battery is the power source for this proposed cleaning robot. Vacuum cleaning system used in this robot is Cyclonic type filtration system which works under the principle of forced vortex flow same as in case of centrifugal pump. Centrifugal force will be created and all types of debris will be sucked in through pipe. The advantage of using this robot will saves time, it will be very much useful for people with mobility issues to clean the house without any difficulties. It is a simple and low cost robot.

BLOCK DIAGRAM
CONCLUSION

The project proposed here is an automated and Arduino based floor cleaning machine. The system is capable of cleaning the floor using a cleaning mop. The system can work without much loss of human physical energy. The system is provided with an Arduino control which uses Bluetooth communication. The android application can be used to control the robot forward, left, right or back. By using the application microcontroller reads the value from the Bluetooth module sends corresponding data to the vacuum cleaning robot. To control the robot used microcontroller.

FUTURE SCOPE

The following shows the advancement that can be done to improve the automation and thereby provide a better control on machine and eliminate complete need of human intervention:

- Image/video captured of a car/house is fed to the controller so that the robot can clean the entire car/house according to the input fed.
- The cleaning mechanism on the robot can be replaced by a handlike structure so that it can lift things from one place to another.
- Voice controlled locomotion of robot instead of remote control.
- Automatic charging.

Virtual wall-used for keeping the robot out of designated areas.

References

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