

UNDER VEHICLE SURVILLIANCE & DUCT CLEANER ROBOT

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Abstract:

Nowadays, robot became very popular. Almost all work is done by the robot. The objective of this project is to provide a robotic system for duct cleaning and surveillance applications. In duct cleaning it is possible to clean duct by removing dust and dirt. In surveillance application things which are hazardous and present in a vehicle can be detected by which we can avoid accidents.

The robotic constructions consist of three major parts which are the Hardware design, electrical design and software development. This robot driven by DC Motor it assembles at front side and the back side. The configuration of the motors are arranged in such that to reduce the robot size. To recognize the duct size, three analogue distance sensor are placed at the left side, right side and back side. It has an articulated arm that can turn around 180. The arm is controlled using four bar mechanism. The whole system of this robot is controlled by PIC18F4550 microcontroller circuits that perform as a brain which is designed in Proteus software while programming was written in C18 Compiler.

A. Present Theories Of Existing System

Nowadays, there are many countries developing a robotics system for cleaning the duct. The Duct cleaning robot had been developed in countries such as Japan, Singapore, Canada and also Malaysia. Some of them are:

- i. Duct Cleaning Robot by Yasuo Watanabe and Musashimurayama from Japan in 2000 (US Patent 6026538)
- iii. XPW-601 manufactured by Hanlim Mechatronics Co.,Ltd from Singapore.
- iv. Smart Duct Cleaning Robot by Dr Xia Qing Hua from Singapore in 2006.
- v. ANATROLLER ARI-100 Duct cleaning Robot, Canada.
- vi. Duct Cleaning Robot by Muhammad Rusydan from Malaysia in 2008.

III. METHODOLOGY

The project is divided into two main parts which are the software and the hardware. Both of them are further broken down into several individual subsystems.

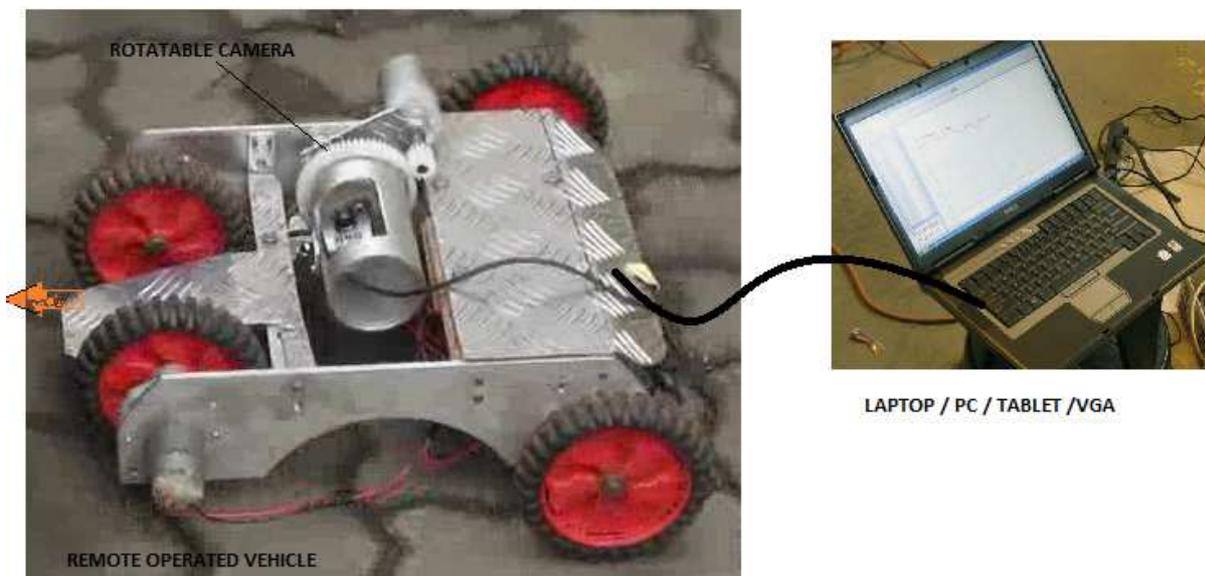
Each subsystem is tested and implemented separately, and integrated together to construct the whole system. In this the hardware development stage of the project will be explained in detail. In addition, the development of the software to compliment the hardware devices will be described.

PROBLEM STATEMENT

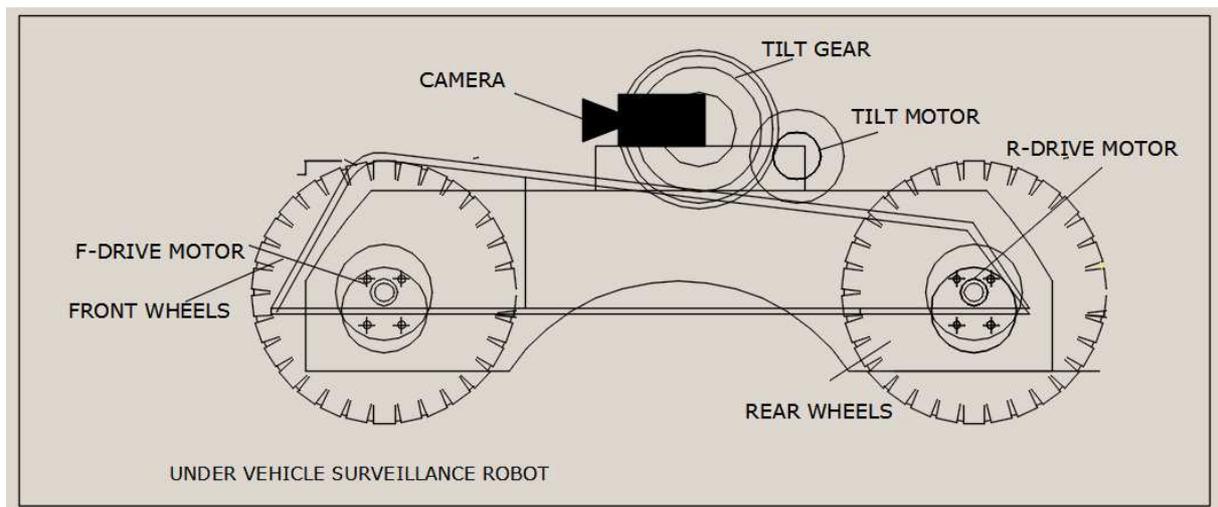
Pipes are poorly clean, so that the fluids flowing like water, cane juice etc. coming out of pipe are not healthy. The bad quality of water will cause various diseases like cholera, taifoid, gastro, etc. And due to scaling of pipe due to cane juice, chemical, mineral flow cause oxidation of duct (pipe), resulting in coming contact with surrounding environment causing different reaction, results in poisonous climate around it. There will be chances of health problem.

The major factor contributing to poor quality is poor maintenance of duct. So the monitoring device must be developed to monitor the actual condition inside the duct (pipe). So that necessary maintenance work can be carried out.

There is chance of hazard due to vehicle containing explosives. There is risk in detecting explosives or bomb bellow the vehicle. Detection manually will cause injury to human also it can cause death of human. The vehicle which is parked in places like Malls, Theaters, Stadium and many other places having existence of people, if contains any explosive material placed below vehicle body can kill more number of people. The example is happened in Mumbai, Pune, Bangloor, etc cities in India. To avoid this possibility of hazard, we are going to design a robot which can help in monitoring such vehicle.



Surveillance robot



OBJECTIVE

The objectives of the study are as follows,

1. For maintenance of ducts.
 - a. To develop and fabricate more user friendly and affordable mechanical robot for duct monitoring and cleaning.
 - b. To examine the robot model performance in terms of camera range and travel range due to different control methods
 - c. To qualitatively investigate the ducting conditions using mechanical robot.
2. To avoid accidents by detecting explosive material which is planted to bottom of vehicle.

Introduction-

Robot is defined as a mechanical design that is capable of performing human tasks or behaving in a human-like manner. Building a robot requires expertise and complex programming. It's about building systems and putting together motors, solenoids, and wires, among other important components. There are a number of subsystems that must be designed to fit together into an appropriate package suitable for carrying out the robot's task.

The word surveillance may be applied to observation from a distance by means of electronic equipment (such as CCTV cameras), or interception of electronically transmitted information (such as Internet traffic or phone calls).

It may also refer to simple, relatively no- or low-technology methods such as human intelligence agents and postal interception.

Surveillance is very useful to governments and law enforcement to maintain social control, recognize and monitor threats, and prevent/investigate criminal activity.

However, many civil rights and privacy groups, such as the Electronic Frontier Foundation and American Civil Liberties Union, have expressed concern that by allowing continual increases in government surveillance of citizens we will end up in a mass surveillance society, with extremely limited, or non-existent political and/or personal freedoms.

An automatic patrolling vehicle acts as a security patroller in the security system, which can monitor those dead zones of the traditional fixed surveillance system.

The remote monitoring capabilities can also be enhanced by using the wireless network and the face detection system is adapted to record and analyze the invaders.

Air ducting is one of the main parts in a cooling system which will easily get dirt when it is operating for a certain periods of time. When this happened, the cool air produced by the air

Conditioner will have contaminants such as dust and bacteria which will consequently affect people who breathe in the air that eventually lead to many health problems such as asthma, cough and lungs diseases.

Now day's sugar industries, chemical industries are going to increase and the product from that industries are going in higher amount in market. To fulfill market need this industries are doing a lot work, so there is no cleanliness due to time limit. It will cause the effect on product quality and also health of customer.

Manually duct cleaning system that uses electricity as its power needs a lot of time and human energy to handle it.

To solve this problem, duct cleaning robot is developed. The duct cleaning robot that uses cable and remote control to operate is not efficient, because of the cable, operator and also the time.

By using sensors we can get output on our display and according to that we have to control the robot.

Nowadays, the development of the autonomous duct cleaning robots focuses on creating more efficient system.

This project will develop prototype of an autonomous duct cleaning robot.

Design criteria

- The robot needed to:
 - Move with adequate speed.
 - Maneuver through the given space.
 - Avoid hitting the walls.

DESIRED FEATURES OF ROBOT

a) All Wheel Power:

Each wheel of the vehicle is powered using 12 VOLT DC motors. The motors are bi-directional hence the auto-reversal is possible. The motors are controlled using remote switches where as the point to point control is achieved using push buttons with normally closed configuration.

b) Zero turning radius modes:

In the reduced turning radius mode, where in pair of wheels turn in alter direction. This system is used at low speeds. This enables the vehicle to turn in minimal possible space.

Conclusion:

The proposed system is implemented on a PC server, Automatic Vehicle and some small smart systems (Two way IP cameras and mobile robot) via Networks to provide the functions of surveillance and remote control. A method of autonomous climbing and descending of stairs was introduced. Stability judgment equations were formulated and used as conditions to prevent tip-over and ensure stability of the mobile robot. The effectiveness of these equations was determined by adding margins to the range of variation of the mobile robot's centre of gravity (COG). The proposed surveillance robot using RFID technique to guide the vehicle cruising according to the pre-defined route. An face detection technique is adopted in this paper by using IPCAM to find out the invader. The WIFI is also applied here to not only transmit the messages from RFID reader and IPCAM or the warning messages to user but also send the remote control signals to the vehicle if necessary.