

Android Based Spy And Fire Fighting Robot

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Abstract- *There are many possibilities a fire can start in an industry or in any remote area. For example, in cotton mills, garments, fuel storages, etc., electric leakages can lead to huge damage. Also it's a worst-case scenario, causing heavy losses not only financially but also destroying areas surrounding it. Robotics is the emerging solution to protect human lives and their wealth and surroundings. The aim here is to design a FIRE FIGHTING ROBOT using embedded system. A robot capable of fighting a simulated household fire will be designed and built. It must be able to autonomously navigate through a modeled floor plan while actively scanning for a flame.*

Keywords- Ultrasonic Sensor, Microcontroller, Temperature Sensor, Bluetooth.

I. INTRODUCTION

A robot is a re-programmable, multi-function manipulator designed to move materials, parts, tools or special devices through variable programmed motions for the performance of a variety of tasks. A robot can also be defined as an automatic device that performs functions normally ascribed to humans or a machine in the form of a human. The Robot in this paper is an Automatic Fire Extinguisher which detects and extinguishes the fire. Fire Fighting Robot is hardware based model used to automatically extinguish the fire during fire accidents.

A robot has been developed which features to move in the direction with respect to the fire intensity. Safety and speed are two of the most important aspects of any rescue operation. When a building or an area is subject to a fire, it can be very dangerous for any of the rescuing parties to assess the situation themselves without being subject to harm.

A great alternative to this would be to use robots. Thus the problem by definition is being able to locate and extinguish a fire with minimal assistance of human beings and as fast as possible using a robot. This is to reduce the likelihood of anyone being injured as well as increase the promptness of putting out the fire due to the fact that a robot should not be affected by issues such as smoke or lack of oxygen. It aims to develop microcontroller based fire fighting

robot. It monitors the areas where natural calamities and bomb explosion occurs.

The following are the goals of this project:

- To increase safety associated with fire fighting.
- To create a way to check for fires without involving human beings directly such that they are not exposed to any threats.
- To be capable of traversing an arena without any concerns about inhaling smoke or burning at any point during the exploration.
- Decrease the time taken to traverse a map with potential fire.

The robot can even act as a path guider in normal case and as a fire extinguisher in emergency. Robots designed to find a fire, before it rages out of control, can one day work with fire-fighters greatly reducing the risk of injury to victims.

The project will help generate interests as well as innovations in the fields of robotics while working towards a practical and obtainable solution to save lives and mitigate the risk of property damage. Using this project human will operate fire robot, through an android device with help of Bluetooth integration module.

II. LITERATURE SURVEY

A main inspiration that set us on the road to completing this project was the Trinity College Fire fighting Robotics Competition [1]. For the competition an arena with 4 rooms was to be traversed by a robot to locate one candle (representing a fire) and extinguish it. Certain constraints such as map size, number of rooms, room positions, time taken to traverse the arena and robot size were recreated for this project in order to measure the success of our robot against available standards. Also, the research conducted led us to many other projects who had previously participated in this competition.

[2] The problem of safety in tunnels is considered, with particular concern to the vulnerability to fire. The important role that robotics may play for fire fighting and preventing is outlined and a robotic system, purposely designed for tunnels, is presented. The system can be installed

in most of the existing tunnels without requiring significant modifications of the existing infrastructures.

From the different papers reviewed, certain patterns started to appear that helped understand different sections of the task at hand. To begin with, the most popular fire detection technique is by using ultrasonic sensors due to their high range and ability to detect fires through walls in some cases.

[3]The fire sensors are kept at certain important preselected places. When a fire comes to mind near a fire sensor it senses it and being like (in some way) bit in the encoder will be put and is sent radio to the RF receiver, connected to machine made to act like man. Once the RF receiver gets the sign, the decoder will put clear and gives details to which fire sensor is activated. The machine made to act like man will move in the direction of the being like (in some way) fire sensor since the places of the fire sensors are already stored in the memory of the machine made to act like man. Once the machine made to act like man reaches the placing, chief division of music of the machine made to act like man will stop and will active liquid-coating device to put out flames) fire. When the fire is put out (flames), spraying is stopped and the machine made to act like man will come back to its first position. Thus the machine made to act like man will purpose, use effectively to control fire with least possible or recorded to do with man coming between groups.

[4]Automatic Fire Extinguisher Robot is a Hardware based model used to automatically extinguish the fire during fire accidents. The temperature sensing power to do of the machine made to act like man is full of changes by heating the thermocouple ends to a cut-off temperature, above which the machine made to act like man starts give a reaction to the fire. The machine made to act like man gets its applications in take away from danger operations during fire chance events where the possible state of for arm men to move into the fire resting flat areas is very less and also during wars to act take away from danger group events. The most added more chances of this machine made to act like man is that it turns ON automatically as it makes discovery of the fire around its everything nearby, using thermocouple and tries to put out (flames) it by moving in the direction with respect to the fire. The temperature sensor provides a backup to the Thermocouple, if needed in vast circumstances.

[5]This practice is not realistic, but for a small scale robot and only a candle to turn off, it is very efficient in terms of how easy it is to implement and how clean it is at extinguishing the fire.

Additionally, the most popular fire extinguishing system was an air fan. This practice is not realistic, but for a small scale robot and only a candle to turn off, it is very efficient in terms of how easy it is to implement and how clean it is at extinguishing the fire. Navigation and maps were mostly done through wall following [2] [4].

III. PROBLEM STATEMENT

Develop an Android app which allows the user to send commands via Bluetooth to a robot which can receive commands via bluetooth and work accordingly. Commands received by Bluetooth modem connected to arduino through serial port. Microcontroller controls motors which allow the movement of robot in all the four directions .transaction. Here also use the secret image during the money transferring one account to another.

IV. PROPOSED SYSTEM



Fig1: Overview of Android Based Spy and Fire Fighting Robot

Figure1 shows the Overview of Android Based Spy and Fire Fighting Robot

1. MICROCONTROLLER-

A microcontoller is a computing device capable of executing a program and is often referred to as the “Brain” or “Controlled center” in a robot since it is usually responsible for all computations, decision making and communication. It collects information from input devices and then executes programs and then according to this execution it controls the output devices such as motors .Microcontroller are often low power devices.

A microcontroller is often small and low cost. Microcontroller perform the main task in the sensor nodes. These are the some of the controllers using digital signal processors field programmable gate array and application.the best choice for embedded system is to use microcontrollers because of the service providing them, like it can connect to othrt devices more flexible and the power consumption is less.

2. TEMPERATURE SENSOR-

Measure temperature and huidity. It acts as input sensor. This sensor uses a solid state technique to determine the temperature. They are very inexpensive and quite easy to use. A temperature sensor plays an important role in many application. It is one of the most sensitive properties or parameter for industries.It is device that gathers data concentering the temperature from a source and convert it to a form that can be understood either by an observer or another device. These sensors come in many different forms and are used for wide variety of purpose,from simple home use to extremely accurate and precise scientific use. It is mainly used to detect temperature or heat.

Temperature sensors measure the amount of heat energy or even coldness that is generated by an object or system allowing us to sense or det ect any physical change to that temperature producing either an analog or digital output. There are different types of temperature sensor available and have different characteristics depending on the their actual application. A temperature sensor consist of two basic physical types: 1) Contact Temperature sensor 2) Non Contact Temperature Sensor.

3. DC MOTOR –

Electric motors are used to actuate something in robot: its wheels, legs, tracks, arms, fingers, sensor turrets, or weapon systems. DC motor converts DC electrical energy to a mechanical energy.The environment that the robot needs to traverse has several characteristics that need to be taken into consideration; the size, the material of the arena, and the location of the candles within the environment. The specifications that were followed in this project matched those used in the Trinity College Firefighting competition.

It is a any class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced bu magnetic fields. Nearly all types of DC motors have some internal mechanism either to periodically change the direction of current flow tn part of the motor.Dc motor were the first

type widely used, since they could be powered from existing direct current lighting power distribution system.

4. BLUETOOTH MODULE-

Designed for transparent wireless serial connection setup. It connects small devices like mobile phone, PDAs, and TVs using a short range wireless connection. Since a new microcontroller was required for processing and interfacing. A separate Bluetooth module had to be used. The module used is the BT2s Bluetooth Module due to its ease of programmability to interface the microcontroller.It is wireless technology standard for exchanging data over short distances. Bluetooth is managed by the Bluetooth special interest group ,which has more than 30000 member companies in the areas of telecommunication ,computing ,networking and consumer electronics.

The IEEE 802.15.1 but no longer maintains the standard. The Bluetooth SIG oversees development of the specification ,manages trademarks.A manufacture must meet Bluetooth SIG standard to market it as a Bluetooth device.a network of patents apply to the technology which are licensed to individual qualifying device.

V. ALGORITHM

Fuzzy logic contorl:

- Tracking fuzzy logic control (TFLC) :
 - proposed to move towards the target.
- Obstacle avoidance fuzzy logic control (OAFCL):
 - proposed to generate control to avoid obstacles.
 - I/P -:angle between target and robot,and distance.

VI. IMPLEMENTATION MODULE

Ultrasonic Sensor Pin Connection & Output:

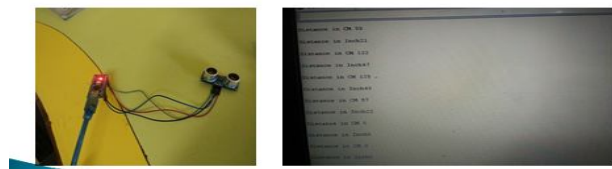


Fig 2 –Ultrasonic Sensor Pin Connection & Output

Temperature Sensor

Pin Connection & Output:



Fig 3:Temperature Sensor Pin Connection &Output

FIRE FIGHTING APP:



Fig 4:Fire Fighting App

Fire Fighting Robot:



Fig 5:Fire Fighting Robot:

VII. ADVANTAGES

1. Patrolling.
2. Reduce the danger of injury to victims .
3. Prevent the danger to property.
4. Saves life.
5. Reduces Manpower.

VIII. FUTURE SCOPE

1. It can be used in various industries for picking various objects where human intervention is not desired.
2. On a large scale, it can be used to develop robots with military applications. It can be used to target enemy without any human being crossing the territory.
3. It provides for more development of applications based on android operating system. Such as , Application based on sensors (accelerometer , gyroscope) etc.

IX. CONCLUSION

The problem of prevention and fighting of fires has been considered in this work. It has been recognized that technology and robotics may play a crucial role for preventing fire. Thus we will be developing a robot which will be used for fire fighting purpose. This proposes a great chance for automation and will be useful at places where human cannot reach or is dangerous.

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