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Forest Safety Regulating Robot

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Abstract: Forests cover 31% of the global land and they are responsible to maintain the ecological balance on the earth. This most essential resource of the human being can be destroyed due to natural calamities like forest fires. These can be caused because of numerous causes like sudden lightning, volcanic eruptions, extreme hot weather or even due to human negligence. These fires can endanger the lives of animals, bids, insects and the other creatures living. The health of people involved is affected, since dust and smoke and carbon mono-oxide released in the air can cause respiratory disorders. Fire departments are forced to use harmful chemicals in order to put wildfires under control. The soil absorbs these and thus fertility of the soil is affected. To avoid these disastrous loses to come extent our project is to detect forest fires in its early stages and to detect animals in the range of 5-6 meters and then report it to the authority via text messaging services. With the help of IoT sensors and algorithms we can get the live status of our forests.

I. INTRODUCTION

Deforestation is the second leading cause of climate change and global warming after the burning of fossil fuels. And forest fires only make it worse. In 2015 Indonesia an estimated 2.6 million hectares – an area four times the size of Bali – burned. While the 2015 fires were some of the worst in recent years. And this created emission of green house gases more than that of the entire US system. Repairing and working of the destroyed forests would bring up 25-30% of the climatic solution.

We are developing a system that will warn us remotely about the live state of the forest and report forest fires through messaging services. Various sensors will be used like the heat sensors to sense the high temperature of the fires and also the warm bodies of the animals in the range of 5-6 meters.

II. PROBLEM STATEMENT

To develop a system that may warn us remotely regarding the live state of the forest and trees via electronic communication services like, unauthorized tree burning, deliberate tree burns, poor soil quality, fires due to lightening and dangerous because of the wind blast.

III. OBJECTIVE

The target of this project is to produce a value economical and a reliable resolution for the protection of the forests that primarily is incredibly important. and to notice animals in close to the fires thus on save them too and avoid to any extent further harm.

IV. SCOPE

The developed system goes to be helpful for the national parks and really giant biological science gardens and nurseries. The system may be upgraded and improved in step with the client has to check the air quality, soil fertility, and optimum temperatures.

Table 1: - Literature Table

Sr. No.	Paper Name	Author	Year	Method
1	IOT System For Forest Monitoring	Alina-Elena Marcus, George Sucic, Elena Olteanu, Alexander Dorus	2018	MG811Carbon dioxide Sensor, Raspberry Pi , GSM Module, Cloud server
2	Design of weather monitoring system using arduino based database implementation	Sarmad Nozad Mahamood	2017	Temp sensors, humidity sensors, real database, arduino system.
3	IoT system for CO2 Monitoring and Forest Fire Detection with Effective Alert Mechanism	M.S.Sruthi1, Dr. M. Newlin Rajkumar2, Dr. V. Venkatesa Kumar	2017	MG811Carbon dioxide Sensor, Raspberry Pi , GSM Module, Cloud server

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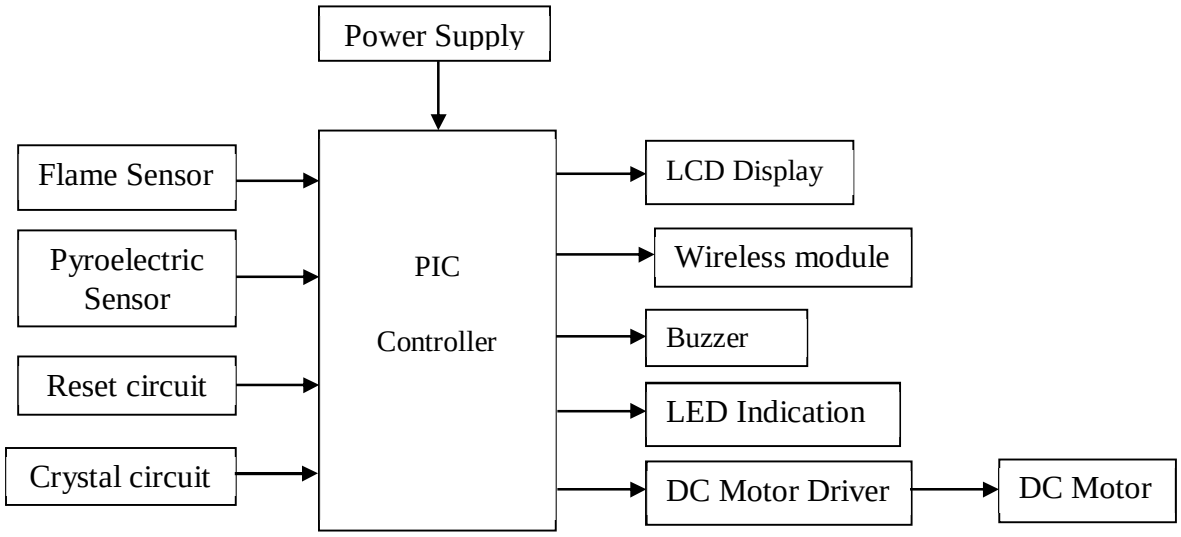
V. BLOCK DIAGRAM



VI. BLOCK DIAGRAM DESCRIPTION

A. PIC Controller

PIC stands for Peripheral Interface Controller. These area unit tiny computers that have each input and output ports. PIC was developed for functioning on PDP computers to manage their peripheral devices, and hence, named as a peripheral interface device. PIC microcontrollers area unit in no time and straightforward to execute a program compared with alternative microcontrollers.

B. Crystal Circuit

The crystal circuit provides the clock pulse to the microcontroller and so to grant it a reference of your time. it's one in every of the foremost vital elements in clock circuits.

C. Reset Circuit

This reset circuit provides a beginning pulse to the microcontroller, while not this the microcontroller cannot begin its functioning.

D. LCD

Liquid crystal display(LCD) is associate in nursing alpha-numeric display which means it will display alphabets and numeric values in addition as special symbols on its screen. alphanumeric display is incredibly user friendly.

E. Motor Driver Circuit

Motor driver circuit is employed to drive the DC motor. L293d is to construct with transistors in addition as Motors. It may be accustomed rotate the device. The L293 is Associate in Nursing microcircuit motor driver that's used for synchronous and bi-directional management of 2 tiny motors. The L293 is proscribed to 600 mA, however in point of fact it will solely handle a lot of tiny currents unless you've got done some serious heat sinking to stay the case temperatures down.

F. Motors

Motor is Associate in Nursing output device its speed are varied in step with the speed set by the switches. The speed may be varied by varied the voltage given to the PWM convertor (using keypad). The speed of DC motor is directly proportional to coil voltage and reciprocally proportional to flux. By maintaining the flux constant, the speed may be varied by varied the coil voltage.

G. Fire Sensor

hearth sensing element is employed as a heat sensing element. it's a thermal measure device and includes a kind of usages together with heat sensing element. Heat sensing element to notice high temperatures. The rule of this heat sensing element that's once the warmth is high round the sensing element then there's resistance on the sensing element to be tiny. BUZZER: Buzzer is employed to grant Associate in Nursing alarm to the driving force if the pressure within the tire reduces below a collection worth that is indicated by the pressure sensing element BJT is employed for this purpose in conjunction with the buzzer.

H. Human Detector Sensor

Sensor could be a electrical phenomenon device that detects motion by mensuration changes within the infrared levels emitted by encompassing objects. As shown in higher than diagram we've got used an individual's sensing element detects motion and warmth generated by the human. once a heat body sort of a human or animal passes by, it 1st intercepts one half the PIR sensing element, that causes a positive differential amendment between the 2 halves. once the nice and cozy body leaves the sensing space, the reverse happens, whereby the sensing element generates a negative differential amendment. The PIR sensing element includes a vary of roughly twenty feet.

I. Theory Of Operation

Pyroelectric devices, like the PIR sensing element, have parts manufactured from a crystalline material that generates an electrical charge once exposed to infrared emission. The amendments within the quantity of infrared placing the component change the voltages generated, that area unit measured by Associate in Nursing on-board electronic equipment. The device contains a special filter referred to as a lens system, that focuses the infrared signals onto the component. because the close infrared signals amendment apace, the on-board electronic equipment visits the output to point motion

J. Application

1) It may be employed in Forest to detected any larceny or hearth remotely .
2) It may be used as Home automation and Security System.
3) It may be used as hospitals, could also be in unit or general wards.
4) This system may be employed in hotels, industrial space.

VII. CONCLUSION

Our main objective is to notice the animals at delimitation of forest in addition because the likelihood of fireside to scale back the unfortunate loss. we've got conducted Associate in Nursing experiment in an internal laboratory setting. to seek out the likelihood of fireside and notice animals at boundary lines, we've got used the digital sensors which give correct output and it provides the proper result with variation of the information.

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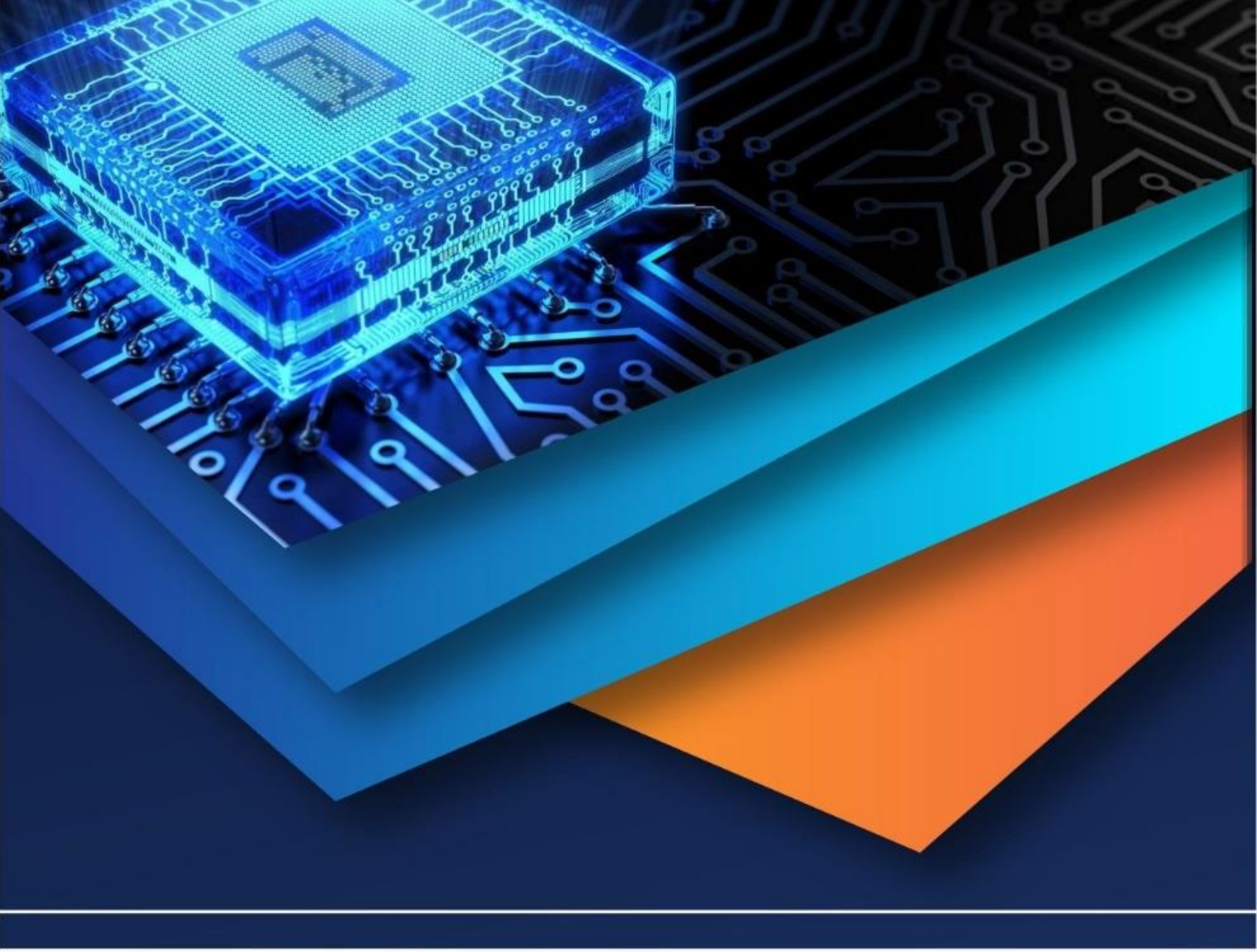
[3] Design of weather monitoring system using arduino based database implementation by Sarmad Nozad Mahamood
[4] IoT system for CO2 Monitoring and Forest Fire Detection with Effective Alert Mechanism by M.S.Sruthi1, Dr. M. Newlin Rajkumar2, Dr. V. Venkatesa Kumar



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