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"FIRE DETECTION AND ALERTING SYSTEM USING ARDUINO"

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ABSTRACT :

Fire injuries are very common incident which takes thousands of life style every year. Fire place may be extinguished if we locate it in early level without damage and additionally evacuation of human can be done quicker. This is especially important in schools and hospitals since kids and patients are hard to evacuate faster. Fire detection and alert system using fire sensor or any camera video. We use machine learning and image processing techniques to detect fire. The fire detection time of our project is approximately 30-50ms which is faster than all existing system like fire sensor. Hence we can identify fire quickly and evacuate or extinguish fire early. Growing technology, came the tools like sensors or is usually called fire sensor is used to monitor or oversee the rooms there is less supervision, so if there are such incidents spark can be rapidly anticipation before the spark of the fire spread and cause a fire. However, even though it has CCTV surveillance with no fixed rarely happen that the name fire. It will be based in the background by the lack supervision off. Even though we've been keeping an eye on a room with CCTV but if the officer's supervisors off guard and not immediate do anticipation when the anti recorded by CCTV and thus are not denied the fire kept coming.

Keywords: Arduino Uno, GSM module 900A, Fire sensor, buzzer, LED's.

Introduction :

officer's supervisors off shield and now not immediately do anticipation while the recorded with the aid of fire sensor and consequently are not denied the fire saved coming. due to the fact the fire sensor can best supervise, then to feature a functionor applied a manner on fire sensor function named sensing fire immediately. As we know in a business enterprise or business vegetation are very vulnerable to fires, whose name takes place whether due to guy or device error in the manufacturing and even now not rarely also induced brief-circuit or shorted electricity. usually, those fire arise in a place that is less oversight which include warehouse garage. in the beginning in all likelihood simplest manifest a small spark of fireplace at the room, but because of the lack of supervision and the slowness anticipation this is executed then the sparks that burn the complete contents of the room so that the fire is full-size.

The developing era, got here the tools like fire sensor or is typically referred to as sensing device is used to sense fire in the rooms there's less supervision, spoil there are such incidents spark may be swiftly anticipation in advance than the spark of the fireplace unfolds and reason a fireplace. However,although it has fire sensor without a hard and fast rarely take region that the decision fireplace. It's going to probable be based definitely within theheritage with the aid of the shortage supervision off. Despite the fact that we'vewere given been retaining an eye on a room with fire sensor however if the sensing.
The project is designed with the Arduino Uno as the number one unit to gain the cost-effectiveness, lowenergy intake, and portability. Arduino Uno additionally offers many specific blessings just like the coupling of extra hardware, offers many opportunities toapply software program and networking, which allows this assignment to use inside the future with one-of-a-kind initiatives as nicely. The importance of the proposed this to make a reliable, safe, and clever device to lessen boundaries and faults like fake alarms, which purpose panic among the humanbeings or even the loss of cash with the use of recent generation. And make the locations safe from the dangerous hearth.

Literature Review :

The purpose of this literature survey is to study the current system present on Fire alerting system and its limitations. We also study alternative solutions that are implemented instead of our proposed model. Through this literature survey we can alsofigure out the pros and cons of adopting a methodology.

1. **Computer Vision Based Fire Detection with a Video Alert System**

Publisher: IEEE G.Sathyakala;V.Kirthika;B.Aishwarya Summary:

The fires occur in a place this is a lot less oversight collectively with warehouse garage.firstly possibly simplest happen a small spark of fire on the room, but because of the lack of supervision and the slowness anticipation that is achieved then the sparks that burn the entire contents of the room in order that the fireplace is first-rate.

2. **An efficient edge detection algorithm for flame and fire image processing**

Publisher: IEEE

Y.Kalpana; M. PadmanSummary:

side detection is one of the pre-processing steps in photo evaluation. Edges characterizelimitations and part detection is one of the maximum difficult responsibilities in photograph processing. virtual picture processing is gambling an increasingly vital rolein imaging primarily based fireplace monitoring systems. when you consider that flameimages are unique elegance of pictures, some of the particular functions of a flame canbe used to perceive flame edges. There are a few variations among flame snap shots and other general pics; the brightness of the flame is normally an awful lot better than the other items at the same time as the historical past s comparatively dark. The expected flame facet ought to be clear and uninterrupted. Several understand part detection strategies were examined to pick out flame edges but the results performed are disappointing. For this reason this new aspect detection set of rules has been proposed for the detection of flame and fireplace alert structures. That is a stepped forward approach which identifies the rims of the flames successfully by using puttingoff all the noises within the flames. some studies work indicates that the present methods do not emphasize the continuity and clarity of the flame and fire edges. The proposed approach identifies the continuous and clear edge of the flame/hearth. This technique detects outlines of an object and boundaries between gadgets and the background inside the photograph. Experimental outcomes for one-of-a-kind flame pics proved the effectiveness of the set of rules.

3. **System to detect fire under surveillance area**

Publisher: IEEE

D. Jayashree; S. Pavithra; G. Vaishali; J. VidhyaSummary:

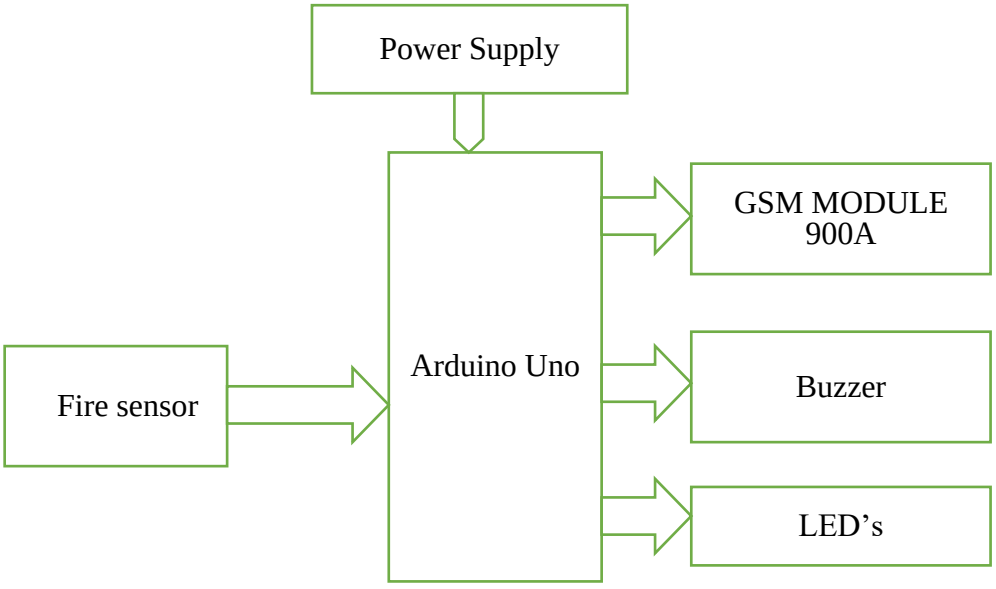
Fire place normally causes severe risks. Therefore, to save you catastrophes that arisein industries, homes, and forest regions, picture primarily based fire detection has become an important problem. in particular, if the combustion at preliminary degree can be detected straight away, the vandalism would be reduced to a more volume. in this proposed gadget, first picture prepossessing is completed and segmented, which incorporates part detection and threshold methods. Histogram of orientated Gradient (HOG) set of rules and gray level Co-prevalence Matrix (GLCM) algorithm are used for extracting the features. Help Vector Machines (SVMs), and set of rules that is usedfor classification. After photo processing segment, detected fire level is given as enterto the micro-controller unit and lcd presentations the fireplace stage like every day, moderate or excessive, and additionally a message could be sent to the worried individual. And if the fire degree is mild or severe, then it's miles alerted through the use of a buzzer. for this reason, the system reduces lifestyles loss and also provides detection of hearth on the preliminary degree in several regions.

Proposed Method :

The Fire detection and alerting system using Arduino is constructed based on Arduino programming. The fire sensor is connected with Arduino uno, and some fire threshold is applied to the fire sensor. The GSM module 900a is used for sending call and message to the particular recipient's number. Power supply is given to the GSM module. Connection is made as shown in the diagram below Initially there is no fire then it does sense fire by fire sensor and green led is on, red led and buzzer is off and there is no fire detected. If the fire is detected by the IR Fire sensor then the green led turns off, red led and buzzer is turned on and GSM module is initially inserted by SIM and it sends the call and message to the particular recipient's number and message is like the 'Fire is detected'. The action will be took place by the recipient who received the call and message about fire detected or not using GSM module. The fire sensor detects the small amount of spark of fire.

Block diagram

Fig. 1. Block diagram of proposed system.



Hardware Components and Equipment

The required components and equipments used to implement the Fire detection and alerting system is presented in Table 1. The components are shown in Fig. 2.

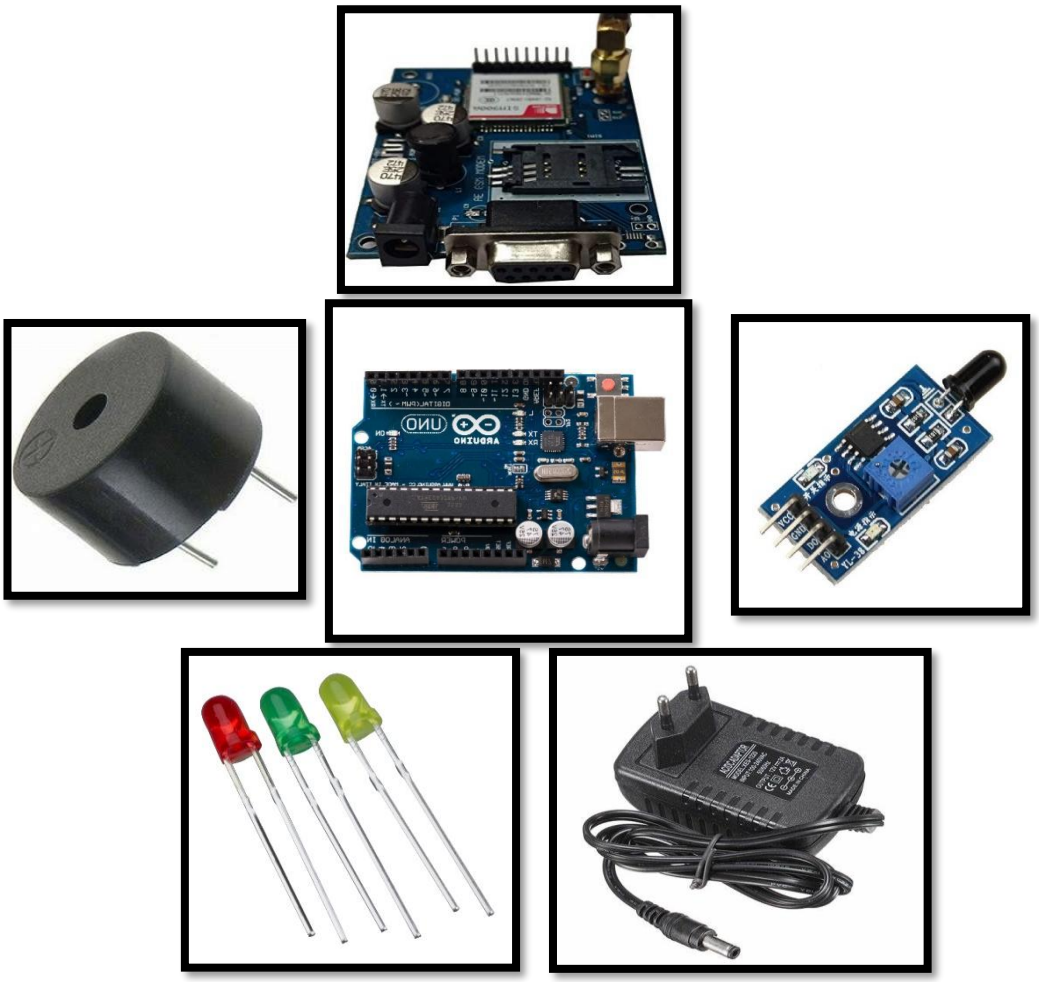


Fig. 2. Components and Equipments Utilized.

Device	Specifications	Quantity
Arduino Uno	ATmega328p	1
Flame sensor	IR	1
GSM module	900a	1
Jumper wires	-	-
Adapter	5v power supply	1
LED	Red and Green	2
Buzzer	5v	1

Table 1: Equipment and Component List

Result :

Fire is detected using fire sensor and it will send the message by detecting the small amount of fire to the Arduino and GSM module and buzzer sounds came and the red led is turns on and the call and message alert is send to the particular recipient's. The connection is as shown in the fig below

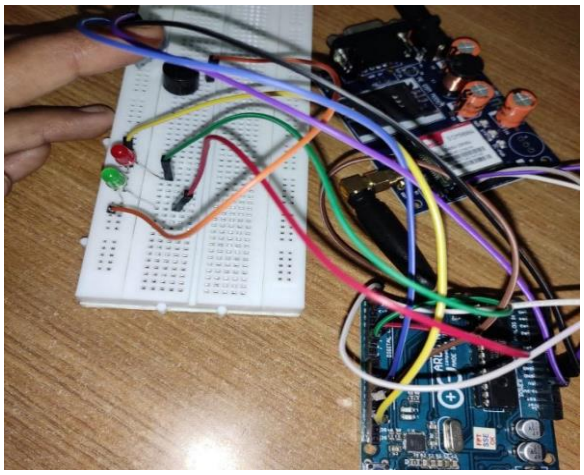


Fig. working module

5. Conclusion

The fire sensor is connected with Arduino uno, and some fire threshold is applied to the fire sensor. The GSM module 900a is used for sending call and message to the particular recipient's number. Power supply is given to the GSM module. Connection is made as shown in the diagram below Initially there is no fire then it does sense fire by fire sensor and green led is on, red led and buzzer is off and there is no fire detected. If the fire is detected by the IR Fire sensor then the green led turns off, red led and buzzer is turned on and GSM module is initially inserted by SIM and it sends the call and message to the particular recipient's number and message is like the 'Fire is detected'. The action will be took place by the recipient who received the call and message about fire detected or not using GSM module. The fire sensor detects the small amount of spark of fire.

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