A System To Detect Forest Fire Using Optimal Solar Energy: A Review

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Abstract: Forest is one of the very important and indispensable resources. The aim of this project is to style and implement an approach that would predict and observe the forest fires and send the precise location to involved officers which might facilitate firefighting personals to extinguish the fireplace within the location once it's in its initial stages using GSM. In this advancing world, it's crucial to protect our surroundings. This project implements a system for watching and menacing for the protection of trees against forest fires. Today IOT devices enable the observation of various environmental variables, like temperature, humidity, flame, smoke etc. Arduino based platform mostly IOT enabled fire detection and observation system that is the resolution to the current problem. This project we've designed fire detector system using Arduino interfacing using few sensors that is a smoke detector, a flame detector and a buzzer.

Keywords: Arduino, GSM module, IOT, Sensors, Solar energy.

I. INTRODUCTION

Forests are very important to life on earth. Forest covers a part of around four billion hectares or so around half of world's area. several life forms rely upon forests to live. Forest not only provides shelter for animals it also prevent soil erosion. Forest fire is a very big disaster which impact living things and it affects the ecosystem and the trees present .These forest fires have a crucial impact on the destruction of vegetation, on region pollution, and directly on human lives. explanation for some uncontrolled social activities and irregular natural conditions, forest fires happen ofttimes. Due to the forest fire in the trees have all become unhealthy and all the animals have been affected. the quantity and impact of forest fires expected to grow as a consequence of world warming. Early detection is the first approach for reducing the harm that is caused in the forest . Early detection of fire is that the key to save lots of large losses in terms of atmosphere, property and lives. Satellite based system was used but it was of low resolution so it had no match impact to reduce forest fire. Wireless device networks will find and monitor fires among forest in real time and now compared to the satellite based mostly technique. A wireless device network (WSN) with the flexibility to get info on conditions of environment and transmitting it using wireless method to a base station for processing. WSNs is one among the foremost reliable tools for early detection of forest fires. WSNs contains small, low-cost and low-power device devices that have ability to live the atmosphere characteristics. the target of this project is to find fire as early as attainable and build a system that is energy economical in distributed atmosphere and additionally economical in performance.

II. LITERATURE REVIEW

[1] This paper is on study on the safety and usage of the wireless sensor network. At present with the support of the IOT wireless networks developing quickly. Wireless sensing element networks gives the information at any time. WSN is the main step for the IOT devices.The node readying surroundings of wireless sensing element networks } terribly complicated it's need to review the safety of wireless sensing element networks so on scale back security threats and network attacks.

[2] A paper that concentrates on the matter of fire as ancient strategies of fireside interference are not effective and it's currently required to boost awareness on the forest fires, mostly to people that live nearer to forest areas. the answer planned recommends of creating use of complete boxes that area unit fully in the forest. These boxes have completely different style of sensors and a radio module to transmit information received from these sensors. These radio modules area unit designed as arranger and router. every of those complete boxes contain differing type of sensing elements like

temperature sensor, CO sensing element, smoke sensing element and flame sensing element.

[3] A style to develop a Arduino based IOT enabled fire detecting and observation system for solution to the forest fire. during this project, fire detector by Arduino that is interfaced with few sensors . GSM is employed to produce the send message to the user through a particular range. The sensing element values area unit showed within the display.

[4] A WSN Network framework for continuing observation and period detecting of forest fires by victimization temperature, humid, aerosolized sensing elements integrate into MICAz motes and therefore the camera sensor IR for detection purpose. The projected WSN design intends to advise fire quicker than typical approach that help in the directional flow of the fire.

[5] A method used in this project is observing the fire and rise in temperature and quick operation in detective work and sending data for far distance to the forest officers to mitigate the fire. The drawbacks of the Satellite-based forest fire Detection Systems has been overcome by this system and Basic Wireless sensing Network-based fire Detection Systems.

[6] A method for management and detecting fire in the with the combined technology. Forest fires are very common that could be a very big disaster to the surroundings and life. so as to guard these and measures have to be taken early to regulate the spreading fire. typically it needs huge dependency of man power, transportation facility and insulating material to trace true space can results in delay. Through this search gave answer for this by implementation the IOT sensor technology. fluctuation is detected by sensors where it observed within the temperature and wetness by using Node MCU small controller that is additionally a Wi-Fi module sending these values to the information to cloud.

[7] A technique on identification of malicious node supported the theory of correlation that detect fault information injection attacking. First, among similar varieties of sensing element information area unit detected supported time correlation. Second, malicious nodes area unit known as spatial correlation technique. Third, the known attacked nodes area unit verified supported event correlation. The results and the comparing with those of existing ways show that the projected model has higher recall with false-positive as low and false-negative rates than those of the normal fuzzy name model and trust weighted -based ways. .

[8]A system that is depending on different sensors together to that and therefore the information from these wireless transmission, to fulfill the of fire detection. The paper tells the important features of wireless sensing element networks as a probable answer to the of earlier detection of forest fires challenge. The system mentioned uses varied sensors hooked up and information transmission through wireless means, to satisfy the activity. These information that is gathered area unit sent to the tiny satellite that transmitting them to the ground station and that they are unit analyze.

[9] An IOT based system which detects forest fires and sends the exact place of forest fire to the officials using GSM. Thus knowing the exact location of fire helps in early extinguishing of forest fire and saving the rest of the forest part from forest fire. By these large destruction in forests can be reduced and ecosystem can be maintained.

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[11]A model and implementation of absolutely sensible fire detecting and hindrance system within the approved area of forests, the projected system initiates the model that contains the of the combination of some sensors for the fires and can alert the closest center for communication. This technique conjointly connects to the ponds to extract the water and water pipelines that area unit close to the forests, activate such entities to hold water to the extent doable to avoid dangerous eventualities. The cameras with fixed sensors will be monitoring the scenes, when the hearth part is found, can activate remaining modules so as to avoid changing into dangerous.

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III. SUMMARY AND OBSERVATIONS

The output from sensor network module is that the most important function in this project. It is important for the to monitor space where it shows the perceived data and following warnings in acceptable manner to the forest official in few time with eternity distance . The the fire attack takes place close to by the unit module and warning is set as attack

takes place and threshold changes within the environmental standing .Equally the warning made thanks to the incidence of rain is shown within the watching space as From the results it shows that a record of the incidence of abnormalities within the forest atmosphere are often simply done and right away compared with abnormalities that occurred earlier that can not be done early observe and monitored. watching of the potential risk areas and an early detection of fire will considerably shorten the interval and conjointly cut back the potential harm yet because the price of fireside fighting.detect fire as early as potential by measure temperature, humidity, smoke and flame and makes the fireplace|fire} department to quickly reply to wild fire.Since in a very forest the power is also crucial and sun may be a huge supply of energy throughout the day time, we have a tendency to build use of alternative energy for our project.To build a system that is energy economical in distributed atmosphere and conjointly economical in performance.Forest fire causes death of the many animals, thus this technique will certainly save the lifetime of animals by dominant the fire .Continuous watching of forest by this technique can cut back man work by directly obtaining the knowledge of generation of fireside in any region of forest.Cost concerned in fitting the methodology is incredibly less compared with the loss of trees.

IV.   CONCLUSION

Forest fire detection using IOT that is implemented with the Arduino. Arduino is interfaced with some sensors and buzzer. The output sensors when forest fire occurs will be send as message to the officials phone number using GSM module.There is a threshold value which is set and when exceeds value of temperature is send as message and displayed in LCD. Whenever there is temperature increase beyond the threshold value in the forest ,detected by temperature sensor, message will be sent to authorities by using the registered mobile number.GSM is used to provide SMS to the user through the given number.The process used is same for the fire detection using various other parameters like flame detection and humidity detection. As flames increase buzzer will get activated and forest fire initimation is conveyed to the authorities. If humidity decreases below threshold value, it will intimated to the forest officials. So forest and wild animals can be protected from forest fires using this technique.

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