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Forest-Fires Surveillance System Based On Wireless Sensor Network

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ABSTRACT
We present the design and evaluation of a wireless sensor network for early detection of forest fires. Wild fires cause to damage on forest and a mountain which have valuable natural resources during the dry winter season Where it becomes very paramount to cover the area caused by fire by the forest fighters. Current surveillance systems utilize a camera, an infrared sensor system and a satellite system. These systems cannot support authentic time surveillance, monitoring and automatic alarm. Even though it gives information about fire caused area,but asthe forest looks same in all areas as it is covered with dense trees it is very hard to recognize the exact area andimage transmition through the transmitter to the officers computer takes too much time .It takes too much time to load the image. Which in turns waste the time and fire caused area goes on increasing. Taking in toconsideration all this faults of the prior system in the forest we have designed our modified project.In our project, we develop a forest fires surveillance system.
Keywords - Forest fire, smoke, sultriness, temperature, zigbee

I.   I.INTRODUCTION

Forest fires cause billions of Rupees in damage toproperty and the environment every year. To combatforest fires effectively their early detection andcontinuous tracking is vital. With the help ofadvanced Wireless sensor network techniques manymethods have been developed to detect a forest firein remote regions. Fire fighters need frequent andhigh-quality information updates of a firesdevelopment in order to conduct an effective andsafe fire fighting mission. Because forest firemonitoring is a difficult task. Forest cover is animportant input variable for assessing changes tocarbon stocks, climate and hydrological systems,biodiversity richness and other sustainability science disciplines. Despite incremental improvements in our ability to quantify rates of forest clearing, there is still no definitive understanding on global trends. Without timely and accurate forest monitoring methods, policy responses will be uninformedconcerning the most basic facts of forest cover change. Results of a feasible and cost effective monitoring strategy are presented that enable timely,precise, and internally consistent estimates of forest. Taking in to consideration all this reasons we are designing a system that will help nature savior by help of advance technology.

II.   LITERATURE SURVEY

One of the forest proposals of the use of wirelesscommunication for fire detection was the sigmaspace system, that used smoke detectors[3].The algorithm used temperature, smoke density and CO density values, and neural networks and fuzzy inference to determine if a fire has occurred.

However, none of these proposals are based on the use of WSN technology. A WSN was used by Vescoukiset al. in[4]. Their nodes were equipped with temperature sensors. The method to detect a fire was simple: if the sensed temperature was greater than 55, than an alarm was emitted. In our forest fire detection method, sensor nodes collect measurement data such as relative humidity, temperature, smoke, and windy speed all these factors are required for determining the forest fire danger rate .A large number of sensor nodes are densely deployed in the forest. These sensor nodes are organized into clusters so that each node has a corresponding cluster header. Sensor node scan measure environment temperature, relative humidity and smoke. They are also assumed to know their location information by equipments such as Zigbee.

III.   PROBLEM STATEMENT

Catching of fire in many of the forest is being detected lately. And which basically causes wide amount of disaster to nature. In prior system weather condition (e.g. clouds) seriously decrease

the accuracy of satellite-based forest fire detection as the limitations led by the long scanning period and low resolution of satellites. So our idea behind this problem is to get the early detection of fire in the forest before it spreads to the entire forest. We will be using different types of sensors i.e. smoke sensor, humidity sensor, temperature sensor. Which will immediately recognize the amount of fire and will send the required data to the forest officer In this way we are trying to help the nature from destroying it.
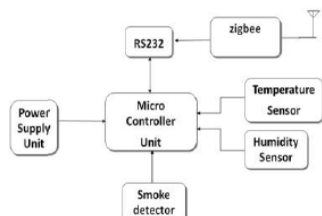
IV.   IV.BLOCK DIAGRAM
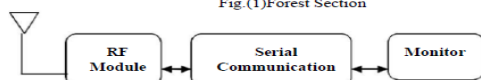

Fig.(1)Forest Section

Fig.(2) Monitor Unit

V.   WORKING

There are two main unites of hardware. In which one is Forest section which will be placed in the forest having Microcontroller unit to which different units are connected.Sensors are used to sense i.e smoke sensor is used to sense the smoke generated by the forest fire.As there occurs change in temperature when fire in been generated so for that purpose temperature sensor is used.Humidity sensor is used to since the humidity in the environment after changing the temperature. For data transmission purpose RF module/zigbee is used that sends the data to the receiver side But to send the data from microcontroller unit to the RF module/Zigbee we require standard RS232 cable. Entire circuit will work on 5v power supply.From the receiver side decoding is done of the data and the signaltransmitted through serial communication cable.

VI.   ADVANTAGES

1. Early Detection of the forest fire by the different readings taken through the sensors.
2. Due to wild the fire causes death of many animals,
   so this system will definitely Save the life of animals by controlling the fire which is been spreded in forest developed Forest Fire Surveillance system consists of WSNs
3. Continues checking of forest fire generated or not this system will reduce man work by

directly getting the information of generation of fire in any region of forest.

VII.   APPLICATION

1. Forest fire applications.
2. In industries for fire surveillance.
3. Big society for fire alert.

VIII.   FUTURE SCOPE

RF Serial Monitor 1 .For future works will be more researches about

Module Communication effective modes of communication that facilitate no data loss to achieve the WSNs for the other
Fig.(2) Monitor Unitapplications.
2. Power supply can be replaced by solar operated battery.
3. Camera can be placed for review.
4. Higher range zigbee can be used.

IX.   CONCLUSION

Working on the system we came to conclusion that Technology can be very effectively used for nature purpose. Our nature can be protected by technology. In real-time observation with FFSS, it provides early extinguishing of a forest fire so that damages and injuries will be reduced. For future works will be more researches about effective modes of communication that facilitate no data loss to achieve the WSNs for the other applications. The forest fire monitoring system will detects fire in the forest. The real time sense data will be recorded in database.

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