

# Dynamic fire detection system based on android Using zigbee

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## ABSTRACT

A ZigBee-based wireless sensor network node for detection of fire based on android technology. A heat sensor and smoke detector are devices that detects heat and smoke and issues a alarm to alert embedded system and nearby people that there is a potential fire. they can detect fire in their early stages and give you those precious minutes to enable you to leave the affected area safely. Wireless communication enables transfer of data or signals over part of the entire communication network. Wireless implementation of sensor network ensures safety in terms of saving lives and property. The sensor node is composed of a temperature sensors,smoke detectors,and a transceiver operated at a 2.4-GHz industrial, scientific, and medical band. A passive heat sensors are designed to have a cutoff at particular threshold value and convert the sensors data into radio signals. Including mixed signal processing and ZigBee transmission, the speed of fire detection is as fast as 70 ms . The sensor node consumes only an average of 2.3 mW from a 3.3-V supply.

**Keywords—** Clustering, Distributed System, Arduino,Network OS,Android System.

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## I. INTRODUCTION

fire is considered as one of the serious threats in our daily life with fast spreading speed and totality of property destruction. Low cost, reliable, and wide coverage fire alarm systems are indispensable in industry to protect the equipment and assets. The damage can be mitigated if fire is detected as soon as possible. The most commonly used fire detector in the fire safety sector is the smoke detector even if they always have false alarms. Some estimates are as high as 11 to 1 for the ratios of false to actual alarms. Current fire detection systems are not able to track and detect fire in real time, and they are unable to analyze the fire. Systems cannot notify people in premise. There is a need to build systems, which can sense and track surrounding and do analysis continuously. The systems that can analyze the fire and notify the people or inform the controller so the controller can take appropriate action to reduce destruction cause by the fire, are need to be developed.

## II. LITERATURE SURVEY

There are many concerns in automatic fire detection, of which the most important ones are about different sensor combinations and appropriate techniques for quick and

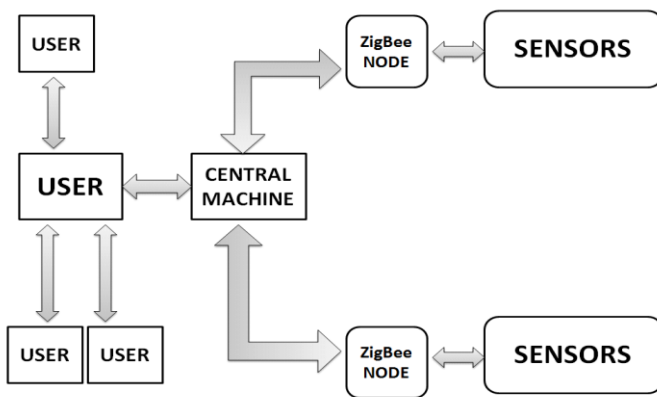
noise-tolerant fire detection. Researchers have been studying fires taking place in various places such as residential area (Milke and McAvoy 2004), forest (Yu, Wang et al. 2010; Bagheri 2008) and mines (Tan, Wang et al. 2008) to find some solutions for fire monitoring. An important issue in automatic fire detection is separation of fire sources from noise sources. For the residential fires, being flaming or non-flaming (smouldering smoke fires), the general trend is to focus either on the sensor and sensor combinations or detection techniques. In another word, researchers have focused either on identifying the best set of sensors which collaboratively can detect fire using simple techniques (Milke and McAvoy 2008; Milke 2008; Cestari, Worrell et al. 2005) or on designing complex detection techniques that use single or at best very small set of simple sensors

## III. EXISTING SYSTEM

With the development of network and communication technology, the WSN has solved the inconvenience into people's life. WSN has good functions of data collection,

transmission, and processing. It has many advantages compared to traditional wired network, for example, convenient organizing network, small influence to environment, low power dissipation, low cost, etc. At present, near field wireless communication technology has been used widely, especially Bluetooth, wireless local area network (WLAN), infrared, etc. But, they have a number of disadvantages, for example, complexity, large power dissipation, short distance, networking in small scale. In order to satisfy the demand of low power dissipation and low speed among wireless communication devices, a new type of wireless net technology-Zigbee emerges as the times require. Current fire detection systems are not able to track and detect fire in real time, and they are unable to analyze the fire. Systems cannot notify people in premise. There is a need to build systems, which can sense and track surrounding and do analysis continuously.

#### IV. PROPOSED SYSTEM & ARCHITECTURE



In This System, Sensors Deployed in the Environment Will Monitor the Environment Continuously, If there is detection of Fire, Sensors will get tripped and will communicate with Corresponding Zigbee Node And transfer their current data to the Zigbee Node .

All Intermediate Nodes will communicate with Central System and Transfer Data Collected to central Machine, Data collected by Nodes is Analyzed by Central Machine then Report Are Sent to Android Device and It will invoke basic alarm system.

The main objective of Proposed system is that it can sense the fire in real time. If any calamity related to fire occurs at any time. Dynamic fire detection will sense it And inform to controller system. The system will be sensitive enough to detect fire so that it will differentiate ordinary smoke and fire smoke.

#### Advantages

##### Real Time Tracking

False alarm rate will be reduced.  
advanced systems which is reliable and accurate.

##### ZigBee

ZigBee is a low-cost, low-power, wireless mesh network standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications. Low power-usage allows longer life with smaller batteries. Mesh networking provides high reliability and more extensive range. ZigBee chip vendors typically sell integrated radios and microcontrollers with between 60 KB and 256 KB flash memory.

ZigBee is a specification for a suite of high level communication protocols using tiny, low-power digital radios based on an IEEE 802 standard for personal area networks. ZigBee has a defined rate of 250 Kbit/s best suited for periodic or irregular data or a single signal transmission from a sensor or input device.

#### Need for ZIGBEE

There are a multitude of standards that address mid to high data rates for voice, PC LANs, video, etc. However, up till now there hasn't been a wireless network standard that meets the unique needs of sensors and control devices. Sensors and controls don't need high bandwidth but they do need low latency and very low energy consumption for long battery lives and for large device arrays.

#### V. ZIGBEE DEVICE TYPES

Zigbee devices are of three types:

1) ZigBee coordinator (ZC): The most capable device, the coordinator forms the root of the network tree and might bridge to other networks. There is exactly one ZigBee coordinator in each network since it is the device that started the network originally. It stores information about the network, including acting as the Trust Center & repository for security keys.

2) ZigBee Router (ZR): As well as running an application function, a router can act as an intermediate router, passing on data from other devices.

3) ZigBee End Device (ZED): Contains just enough functionality to talk to the parent node (either the coordinator or a router); it cannot relay data from other devices. This relationship allows the node to be asleep a significant amount of the time thereby giving long battery life. A ZED requires the least amount of memory, and therefore can be less expensive to manufacture than ZR or ZC.

#### VI. CONCLUSION

The security features provided by the ZigBee standard can be considered as very strong and robust. We Presented New Approach for fire Detection Using Zigbee . The Fire Flame Detection Algorithm Using Thermal Sensors and Smoke Detectors are Used to Implement Wireless Sensor Network. Hence we Have Presented A low cost, low power, Zigbee Based Dynamic WSN System for the Fire Detection Contributing to the Fire Safety Protection. The Output Of The System Is a System which can sense and track surroundings and do analysis continuously.

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