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SMART CITY EMERGENCY COMMUNICATION OVER HILLY AND FOREST REGION WITHIN NETWORK COVERAGE

K. Madhumitha[1], R. Prakash[2], S. Sudha[3], V. Hemalatha[4]
[1,2,3]Student, Dept. of Computer Science and Engineering
[4]Associate Professor, Dept. of Computer Science and Engineering
N.S.N College of Engineering and Technology, Karur, India.

ABSTRACT
In remote areas with poor network coverage, like hilly or forested regions, communication during emergencies is challenging. To tackle this issue, a proposed system employs acoustic waves for communication. Using Radio Frequency generation, a Transmitter and Receiver facilitate acoustic wave transmission, enabling data communication. Magnetic waves integrated with acoustic waves enhance communication efficiency via Internet of Everything approach. This cost-effective and easily integrated RF module is ideal for emergency communication scenarios. Additionally, an emergency button allows individuals to initiate communication, offering an efficient solution to communication limitations in remote areas.
KEYWORDS: *Arduino, RF transmitter, RF receiver, IOT, Sensor, GPS.*

1. INTRODUCTION

The main objective of the system is to provide communication in hilly regions at emergency situations. Mostly communication cannot be provided in those area which is more interior where cellular connected or Tower connection will not be provided. Internet Of Things (IoT) involves connecting various physical objects and devices to the internet, enabling them to exchange data without direct human interaction. This approach provides numerous benefit such as accessing a wide range of information and services through devices like smartphones, laptops, and tablets. Additionally, it mentions the potential for extending these benefits to other physical objects and locations, making everyday tasks more convenient and efficient.

2. EXISTING SYSTEM

In an existing system for emergency communication, normal radiation tower-based processing can be implemented, where a normal process in a real-time environment can be created. In most of the survey, the real-time existence of frequency and radiation transmission can be maintained with emergency underwater level monitoring systems, which are taken as services in the literature survey. The normal range of communication can be achieved in the existing system, where it is not taken into consideration for the proposed system in an emergency. Mostly in the hilly regions, emergency problems cannot be identified, and emergency situation case data communication cannot be processed where it has been taken as a problem statement in the implementation. Thus, a smart monitoring system will eliminate this communication problem without our having to enhance.

Demerits

- Higher amount of radiation might cause cancer.
- Tower areas cannot be analyzed.
- High amount of tower implementation will proceed higher cost.
- Emergency data transmission or emergency information transmission cannot be made.

3. PROPOSED SYSTEM

In this system, a Radio Frequency based transmission of the data in emergency cases has been used. In the developed hardware part, the arduino is connected with RF transmitter and receiver. This make an intimation to the receiver regarding that the sender is in danger. The developed RF communication focuses with a transmitter and the receiver system combined on a frequency pattern. With a wide range of frequency the system with RF range fixed can transmit the data in emergency cases. Here GPS (Global Positioning System) gets the location of the person to the concern saver. This the complete system helps in easiest detection of the emergency situation in hilly region is done. Communication can be wide enough for the concern range where it will be most enough for the emergency processing system. Acoustic waves manner can be generated with electromagnetic generation system which will Travels the date of from one part of transmitter to the receiver side.

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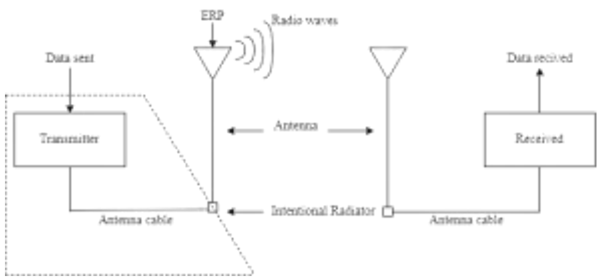

Fig.1 Transmitter and Receiver Architecture

Transmission Of Data: Sensors can be temperature sensors, movement sensors, dampness sensors, quality sensors and light sensors. These sensors, in conjunction with an association, permit us to consequently collect data from the environment, which, in turn, permits us to make more intelligent decisions. On a cultivate, consequently getting data about the soil dampness can tell agriculturists precisely when their crops need to be watered. Rather than watering as much (which can be a costly overuse of water system frameworks) or watering as little (which can be a costly misfortune for crops), the agriculturist can guarantee that crops get precisely the proper amount of water. This empowers ranchers to extend their trim surrender while diminishing their related costs.

Data Receiving: IOT is exceptionally recognizable, with machines getting data and then acting. The printer gets a record, and it prints it. The car gets a flag from the car keys, and the entryways open. The illustrations are endless. Whether it's as straightforward as sending the command "turn on" or as complex as sending a 3D show to a 3D printer, we know that machines are able to tell machines what to do from a distance.

Intension Radiator: In smart cities, emergency communication in hilly and forested regions within network coverage relies on Intentional Radiator (IR) technology. IR devices are strategically placed transmitters that emit signals with specific power levels and frequencies to ensure reliable communication over challenging terrain. These devices boost signal strength and optimize coverage, enabling seamless emergency communication even in rugged environments, helping authorities respond effectively to incidents and ensure public safety.

Antenna: In hilly and forested regions, traditional communication methods like cellular networks may have limited coverage due to terrain obstacles. Smart cities in such areas often utilize antenna systems strategically placed on high points to overcome these challenges. These antennas enhance network coverage and enable reliable emergency communication by extending the reach of signals over rugged terrain, ensuring that critical messages can be transmitted and received efficiently in times of need.

Radio Waves: In hilly and forested regions, traditional forms of communication like cellular networks may face challenges due to signal obstruction. However, radio waves can penetrate obstacles like trees and terrain more effectively, making them suitable for emergency communication in such areas. By using radio waves, smart city emergency systems can maintain reliable communication even in rugged terrain, ensuring that critical information reaches first responders and citizens in need.

Merits

- The system will make an emergency communication in over hilly regions or villages.
- The RF transmitter and receiver can act as a intermediate communicator range of 100 kms with accuracy 82 percentage.

4. MODULES

- Network Creation.
- Emergency Push Button.
- Megnatic Resonance Transmission.
- Data Receiver.
- Location Anaysis.

Modules Description

Network Creation: There are numerous clusters in an arrangement for submerged information collection. Each cluster encompasses a door hub. Since the throughput at the portal increases with the decrease in transmission, whereas it diminishes within the moment-hop multi-access communication, this propels us to discover an optimal number of clusters within the submerged so as to achieve a maximum organized throughput with the chosen multi-access protocols within the two stages.

Emergency Button: The emergency button can be done with emergency case situation generation, where the emergency case situation can be alerted with the button interface system.

Magnetic Resonance Transmission: The magnetic resonant wireless power transfer in conducting medium and found out an optimal frequency for designing the system. In a conducting environment, the eddy current loss is generated by the high-frequency alternating currents in the coils. It is manifested by the increased radiation resistance of the resonator coil, which leads to a decrease in the quality factor, which reduces the wireless power transfer efficiency in the conducting medium.

Data Receiver: The receiver synchronization method is used to transmit the data through electromagnetic signals and acoustic waves. The synchronization process involves time-stamp network connectivity with area and note management. In this area, we ponder the execution of an adjusted receiver-synchronized S-Aloha, considering proliferation delay variance as a work of transmitter-receiver removal.

Location Analysis: Location analysis is the process by which the exact of the latitude and longitude values can be extracted. The extraction can be done with a GPS system where the location-based points are gathered from the map and the current implementation of the location can be known. The system identifies this location and inputs it to the concern. LCD display at the receiver side

5. CONCLUSION

This system enables the transfer of vital emergency problem to the hub in reduced and packed format using limited bandwidth wireless network. This preference scheme is only intended for use by IEPS users to be able to place buttons with preference. Public emergency services, on the other hand, are intended for use by members of the general public to request services such as fire, police, and medical. They are often invoked by a short access code. The IEPS enables the use of public telecommunications by national authorities for emergency and disaster relief operations. It allows users, authorized by national authorities, to have access to the hub, while this service is restricted either due to damage, congestion or faults, or any combination of these. This Recommendation describes the functional requirements, features, access and the operational management of the IEPS.

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