GSM GPS BASED WILDLIFE ANIMAL TRACKING SYSTEM

Dr. P. Joel Josephson[1], Nandimalla Goutham[2], Rapaka Deva Raju[3], Ichavarapu Suresh Kumar[4], Maduri Sai Ganesh[5]

[1] Associate Professor, Dept of ECE, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), Hyderabad, TG, India.

[2,3,4,5]UG students, Dept of ECE, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), Hyderabad, TG, India.

ABSTRACT: GPS based Wildlife animal tracking system is used to track the location of Animals in wildlife reserves or national parks. This project utilizes a GPS modem and a GSM modem for this purpose. A forest officer or Government authority person will get these SMS containing Longitude and Latitude. As the human race or human society is growing, wildlife animals or wild animals are in danger. But as per nature's rule, every living creature on this earth is important and has an important role ecosystem. Also, we get some medicines or useful drugs from some animals. We have already realized this, so in every country, we see that there are wildlife animal reserves and national parks where these animals can live freely in forests or in a jungle however these are monitored by human beings. Also nowadays these wildlife national parks have become popular tourist places. Many endangered species or rare species are available or preserved here. For example white tigers, pandas, and many other animals. But these animals also undergo some diseases or there can be some situations where human being attention is required for these animals like vaccination of these animals. If they met with some accident or are hurt then we have to cure their wounds, in such cases, we need to catch those animals and do the required treatments. The main problem in such situations is that in large wildlife sanctuaries these animals are really hard to locate. Due to this many times, we have to search the entire area.

Keywords: GSM, GPS, animals, SMS, WSN, Cloud.

I INTRODUCTION

As per nature's rule, every living creature on this earth is important and has important role in ecosystem. Since human race, or human society is growing, the wildlife animals or wild animals are in danger. Endangered animal and wildlife, they live in the protected forest or

national park where are in big area and when we need to know about the number of the special wild animals such as tiger or leopard, they become very hard to track or count them because they live in the big forest where there is no infrastructure for data communication. Fig 1. Shows a cheetah with tracking collar on its neck. Hence in order to track the location Global Positioning System receiver and Global System for Mobile communication is used. In this project a GPS modem helps to get the coordinates of the location. This modem requires minimum 4 satellites Global Positioning System modem receives location parameters like latitude and longitude from the satellite. We have also used GSM modem which sense these parameters to particular mobile number through SMS. This information is used to locate the current location using Google map. We have added a temperature sensor to this project. If the animal has fever or if there are some wounds on animal body and because of wounds temperature of animal rises, then it sends SMS to the forest officer so he can give immediate attention.Hence in order to track the location Global Positioning System receiver and Global System for Mobile communication is used. In this project a GPS modem helps to get the location. This modem requires minimum 4 satellites Global Positioning System modem receives location parameters like latitude and longitude from the satellite. We have also used GSM modem which sense these parameters to particular mobile number through SMS. This information is used to locate the current location using Google map. We have added a temperature sensor to this project. If the animal has fever or if there are some wounds on animal body and because of wounds temperature of animal rises, then it sends SMS to the forest officer so he can give immediate attention.

As per nature's rule, every living creature on this earth is important and has its role in ecosystem. Since human race, or human society is growing, the animals are in danger. They live in the protected forest or national park in a big area and when we need to know about the number of the special wild animals such as tiger or leopard, they become very hard to track or count them because they live in the big forest where there is no infrastructure for data communication.

II LITERATURE SURVEY

1) The role of communication in day to day life is very important .Communication can be of two types which are wireless or wired. Basically wireless communication is mostly preferred over wired .But sometimes we need a secured wireless communication in case of industries,

companies etc. This paper helps in enabling the user for transmitting data wirelessly through ZigBee with encrypting data to provide security. In the paper it consists of two sections they are transmitter and receiver .The data can be sent to microcontroller through pc by using software called hyper terminal, this software is used for serial communication. The microcontroller after receiving the data it forwards the data to the ZigBee transmitter which is connected to the microcontroller. The data is encrypted and then transmitted to receiver. ZigBee transceiver does data transmission. Encryption does conversion of plain text to cipher text. Original data is Plain text whereas the modified data by using operations so that only authorized person can decode is called as Cipher text. Decryption does conversion of Cipher text to Plain text. The received data is decrypted and is displayed on pc which requires some password to open the data. So by this the data cannot be hacked and is secured.[1]

2) Security of data in army stations is an important issue. In early systems, at the time of information transmission between two army stations, it can be hacked by terrorists, spies and enemies. Cryptography is a very important system employed for this purpose. There are various types of algorithms available for encryption and decryption of data and new algorithms are evolving. Polyalphabetic substitution cipher is a strong algorithm used for security of data in army stations. In this paper, various techniques of security of data and one the algorithm using polyalphabetic substitution cipher are discussed.[2]

3) In earlier security systems, data transmission between two army stations was being hacked by terrorists, enemy nations and even spies. Hence, data security is very important especially from defense point of view. There are various techniques for transmission of data securely. Cryptography is a one of the technique which can be used for secured transmission of data. There are numerous algorithms available for encrypting and decrypting data and many algorithms are being discovered. Poly alphabetic cipher algorithm is one of the strongest algorithms used for securing data in army stations. In this paper, poly alphabetic cipher algorithm is discussed for wireless data transmission between army stations using arm7 processor.[5]

4) Stealthiness can be described as a disposition to be sly and to do things surreptitiously. This paper presents a new architecture for flexible and secure networking in battlefields that enables stealthy and covert communication in the presence of node mobility. Our architecture is based on the combination of optical (fiber) and wireless links. Our objective is to be able to carry on undeterred communication without the attack/eavesdropping nodes being able to

detect the presence of any communication. This objective is not only crucial for successful completion of the operation, but also for the safety of our mobile nodes, by not giving out their locations. We combine the advantages of optical links, such as high bandwidth, low delays, low error rates, good security, with the advantages of wireless links, such as mobility and flexibility, along with directional antennas for communication. From security point of view, we also assume presence of red zones, which are the ones controlled by the adversary or where the adversary can trace wireless activities.[6]

III **EXISTING SYSTEM**

Talking about existing technologies in some countries, many animals have belts on their neck. This belt has a wireless transmitter. A wildlife officer has a receiver in his/her hand and will search the location. However the main drawback of this technique is that range of wireless transmitters is less. In some sensors, it is 100 meters in some sensors it is in few kilometers but not more than that. But as we know that forests and wildlife national parks are hundreds of kilometers in length. And in such situations, these wireless transmitters are not much useful and they are time-consuming. With the help of GPS technology and GSM technology, we can track an animal in a forest of thousands of kilometers in length.

IV **PROPOSED SYSTEM**

This research is meant for the design of wildlife animal tracking system using GPS and GSM. This explains the methodology to overcome the problem of animal injury and mortality due to straying of wild animals out of national parks and wildlife sanctuaries by the use of wildlife tracking system. Automatic tracking system has been implemented by incorporating GSM and GPS technology in the form of a device that would be attached to the body of an animal and would be continuously monitoring the position of the animal with respect to the GPS defined boundaries setup inside a wildlife sanctuary or national park. In case an animal strays out of the GPS defined zone, the coordinates specifying both the latitude and longitude information of an animal informing the concerned officer about the approaching danger. This system is flexible, low cost and simple to execute and can be beneficial for monitoring wildlife related complexities like poaching, railway and roadway accidents, destruction of vegetation and threat to life on the straying of wild animals out of their habitation area.

V WORKING METHODOLOGY

A GSM GPS-based wildlife animal tracking system relies on lightweight GPS tracking devices attached to animals' collars or harnesses. These devices incorporate both GPS and GSM modules, enabling them to determine the animal's precise location using GPS satellites and transmit this information via cellular networks. As the animal moves, the GPS tracking device periodically sends its location coordinates, along with other relevant data such as time stamps and sensor readings, to a central database or server using GSM communication. In the central database or server, the received tracking data is processed, stored, and made accessible to authorized users through a web interface or specialized software application. Researchers, wildlife managers, or conservationists can monitor the tracked animals' movements in real-time or analyze historical tracking data to understand their behaviors, habitat preferences, and interactions. The system may also provide features such as setting up geofences or alerts to notify users of specific events like animals straying outside designated areas or exhibiting unusual behavior.

The GSM GPS-based wildlife animal tracking system plays a crucial role in wildlife conservation efforts by providing valuable insights into animal behavior and movement patterns. By tracking animals remotely, researchers can gather data without disturbing their natural habitats, allowing for more accurate and comprehensive studies. This information aids in wildlife management decisions, habitat protection measures, and the development of conservation strategies tailored to specific species' needs, ultimately contributing to the preservation of biodiversity and ecosystems.

CONCLUSION

Wildlife monitoring is important for protection, sustainable and scientific management of wildlife resources. Although there is currently a lot of work on building real sensor systems, very few attempts have been made to deploy them in the field and then maintain and develop them. The study on the animals through this system for their conservation.

References

[1] Mattisson –"Effects of species behavior on GPS Collar Fix Rates",(2010).

[2] A.Tovar, T.Friesen, K.Ferens- "A DTN wireless sensor network for wildlife habitat monitoring" 23rd Canadian Conference on Electrical and Computer Engineering(May 2010).

[3] Lorenzo Quaglietta- "A Low Cost GPS GSM/GPRS Telemetry System: Performance in Stationary Field Tests and Preliminary Data on Wild Otters" Journal ,January 2012, Volume 7 Issue 1.

[4] Lawence A.Wan, Malibu –"Self-Charging Power Controlled System for Locating Animals by GPS", United States Patent Application PublicationWan, August 16, 2012.

[5] Eltimir Stoimenov, Tsvetan Shoskov, Rosen Miletiesv and Ivailo Pandiev-"Design of GPS based Wild Animal's Tracking System with reduced size and weight", Conference paper(CSET), June 2013.

[6] Joshi V.Bhange S.Chopade-"Wildlife Animal location detection and Health Monitoring System" International Journal of Engineering Research and Technology Vol.03 Issue:11 (Nov-2014).

[7] Khtatal Sachin Sahebrao-"GPS/GSM based animal tracking and health monitoring system", International Journal of Engineering, Education and Technology Vol.03 Issue 02(April 2015).

[8] Kshama s.Bhise-"Wildlife Animal Tracking using RFID and GSM technology", International Journal of Scientific and Engineering Research, Vol.07 Issue:02(Feb-2016).

[9] James P.GIBBS- "Effective Monitoring for Adaptive Wildlife Management: Lessons from the Galapagos Island" Journal of Wildlife Management(May 2015).

[10] Lawence A.Wan, Malibu –"Self-Charging Power Controlled System for Locating Animals by GPS", United States Patent Application PublicationWan, August 16, 2012.

[11] Eltimir Stoimenov, Tsvetan Shoskov, Rosen Miletiesv and Ivailo Pandiev-"Design of GPS based Wild Animal's Tracking System with reduced size and weight", Conference paper(CSET), June 2013.

[12] Mr. Mohammed Azharuddin, Mr. Yasser Nizam, Mr. Wajid Hussain, Smart Shopping Cart With Automated Billing System, International Journal of Multidisciplinary Engineering in Current Research - IJMEC Volume 8, Issue 7, July-2023, http://ijmec.com/, ISSN: 2456-4265.

[13] Mr. Shaik Fayaz, Ms. Pedddinti Nandini , Mr. Vemula Mallikarjuna Rao , Mr. Sampath Kumar, Rfid Based Examination Room Guide Navigation System With Voice, International Journal of Multidisciplinary Engineering in Current Research - IJMEC Volume 8, Issue 7, July-2023, http://ijmec.com/, ISSN: 2456-4265.

[14] Mr. Muzammil Hussain , Mr. Syed Masiuddin , Mr. Mk Ameeruddin , Ms. Rubeena Begum , Smart Energy Meter With Overload Trip Facility And Alerting, International Journal of Multidisciplinary Engineering in Current Research - IJMEC Volume 8, Issue 7, July-2023, http://ijmec.com/, ISSN: 2456-4265.

[15] Joshi V.Bhange S.Chopade-"Wildlife Animal location detection and Health Monitoring System" International Journal of Engineering Research and Technology Vol.03 Issue:11 (Nov2014).

[16] Khtatal Sachin Sahebrao-"GPS/GSM based animal tracking and health monitoring system", International Journal of Engineering, Education and Technology Vol.03 Issue 02(April 2015).

[17] Kshama s.Bhise-"Wildlife Animal Tracking using RFID and GSM technology", International Journal of Scientific and Engineering Research, Vol.07 Issue:02(Feb-2016).