IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Geospatial Animal Tracking and Analysis of the Animal Paths using GIS

[1]Vismaya D,[2]B P Sowmya

[1]Research Scholar, Dept. of MCA, PES College of Engineering, Mandya, Karnataka.
[2]Assistant Professor, Dept. of MCA, PES College of Engineering, Mandya, Karnataka.

Abstract: **Animals are important and should be cared for in human life. They should be provided with appropriate care in a proper, suitable and safe environment. A system is needed to remotely track and monitor animals. New technologies evolve over the years. As major enabling technology for tracking worldwide stuff, RFID (Radio Frequency Identifier) has developed. As a power supplier, RFID tags need battery to run the microchip circuitry, and transmit signal to the RFID reader. This is the system we develop that helps users understand the behaviour of the animal for research/study purposes who are not all allowed to track and study these animals.**

Index Terms **- Animal Tracking, RFID, GIS, KNN, SVM, Naïve Bayes.**

I. INTRODUCTION

A variety of ways can be used for RFID, GPS and sensors. RFID tags can be used for tracking and identification, physical distribution and access control, as well as animals and persons. GPS is used in many applications, including automotive navigation systems. In particular, network sensor applications gain a lot of traction. Health, military and home are among the applications. In military monitoring, recognition, and targeting systems, for instance, sensors can be used. In the medical field sensor nodes can also be used to monitor and support persons with disabilities. Cargo tracking and disaster monitoring can also be carried out with sensor nodes. Many studies on animal and plant monitoring using RFID, GPS, and sensors have recently been performed. RFID, for example, is used to manage expensive fish such as sturgeons. It is also used to track horses based on race findings, health tests and dope tests. For animal and plant environments, sensor networks are used. Furthermore, there is a GPS-based cow location tracking service and a satellite system. However, few studies and services use RFID, GPS and sensors for monitoring animals' and zoological workers' positions in zoological gardens.This study provides an intelligent RFID, GPS and sensor-based zoological garden animal tracking service. This service consists of using sensor nodes to detect animals' body temperatures, using GPS for animal and zoo tracking and RFID to identify animals, zoologists and veterinarians. We implement and test a prototype of the system proposed following the establishment of a service scenario for the proposed tracking service. The system proposed may give zoo visitors real-time information such as the body temperature of the animal, its position on a website, and so on. The technology can track animals also if you leave your cage.

II. LITERATURE SURVEY

Recently, remote monitoring systems have evolved to respond for particular needs in healthcare \ssector, which is an essential pillar in the modern concept of smart city, we propose a smart \ssystem to monitor patient current health conditions, as a smart healthcare system based on the \swidely spread available technologies; namely, GSM and GPS. Statistics show that the risk factors for high mortality are hypertensive heart conditions and blood pressure, so preventive measures are to be implemented to ensure real-time health surveillance, so as to save patients' lives in time.[1].

Animals become a component of the ecosystem. Animal life is now at risk, the animals need to be protected. Thus, animal monitoring and tracking is becoming increasingly important. Four main applications have been installed in the proposed system: localisation, health surveillance, normal movement surveillance and sending cloud data. GPS is used for animal coordinates in the location tracking system. Temperature sensors are used to measure animal temperature in the health monitoring unit. Every animal usually has a special body temperature variety.[2]

Every living thing on this planet has an equal role in the ecosystem. However, the survival of wild animals is currently under jeopardy. Wild animals used to be able to roam freely in the jungle or the forest. Physical harm or disease may result in the death of animals in the forest if they have an accident in the forest. In such cases, we are unable to pinpoint the specific location of the animal in such a broad area.

A wildlife animal tracking system is used to minimise complications such as discovering the exact geographical location of an animal in the jungle, a national park, or a wildlife reserve. The Global Positioning System and the Global System for Mobile Communication are used in this system.[3]

There are an increasing number of problems relating to animal health and movement. As a result, a ZigBee-based animal health monitoring and tracking system has been developed. ZigBee technology is being more widely used in a variety of applications. Sensors such as the temperature sensor, heart rate sensor, pulse rate sensor, and respiratory sensor are used to monitor an animal's health. To display the digital data, the ZigBee module would be connected to a Graphical User Interface (GUI). The data from the sensors, on the other hand, is converted using an analogue to digital converter. The originality and feasibility of both animal tracking and monitoring along would be the system's contribution.[4]

This project proposes a self-contained GSM-based animal health monitoring system. Sensors monitor the physiological conditions of the animals, and the output of these sensors is transferred by GSM to a server system, which is a mobile phone. GSM, GPS, and a phone make up the remote wirelessmonitor. The measured signal must be transmitted to a mobile phone, which can then be used to collect data. The benefit of this initiative is that it will take into account more parameters such as temperature and heartbeat, allowing for early detection of dangerous disorders. When the measured signals exceed a certain threshold, the GSM will send a message to the caretaker's phone. This project demonstrates how to track the location of animals as well as their health state. As a result, several instruments are put on them for security purposes, allowing them to monitor their health and ammo. Bio-sensor systems combine a variety of small physiological sensors, transmission modules, and processing capabilities to enable low-cost, unobtrusive health monitoring solutions. The GPS receiver is used to record the longitude and latitude of animals so that their direction can be easily determined, and this information is saved in the microcontroller memory. To calculate geographic position, a GPS receiver receives and compares signals from orbiting GPS satellites.[5]

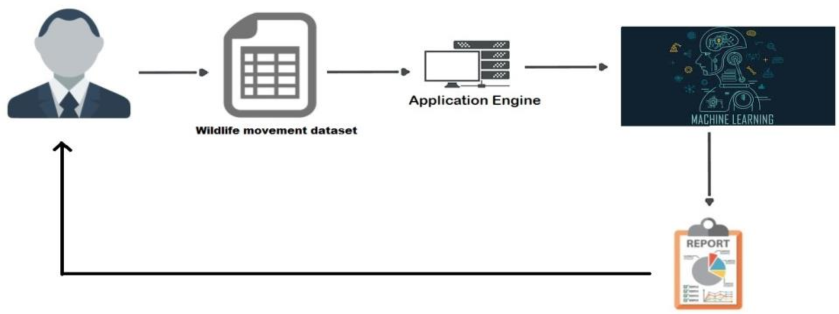
Animals play a vital role in our daily lives. The majority of the time, humans living near forests are in danger because animals invade their living areas, hence animal detection is critical. Some animals suffer from disease; if they are injured or have been in an accident, we must treat their wounds. In such circumstances, we must catch the animals and administer the necessary remedies.

The main issue in such cases is that these species are extremely difficult to identify in vast wildlife reserves. As a result, we frequently have to search the entire area. We're working on a project named "Animal Tracking and Health Monitoring Using Zigbee" to avoid similar issues. Temperature sensors were utilised to monitor the health of the animals in this experiment. The animal's whereabouts is tracked using a GPS device.

Temperature and position will be displayed on the LCD, and this information will be sent to a specific mobile phone through Bluetooth.[6].

III. PROPOSED SYSTEM

In this paper we are evaluating the patterns of wild animals in this project, which will aid in the study of their behaviour. The acquired dataset contains animals that have been categorised and their movements based on RFID tags. These data are gathered through forest officials or researchers, who will attach an RFID tag to the animals and monitor their movement and boundaries, while a reader reads the tag and records the information. It is then used for analysis after gathering all of the information on the animal and its movements. It is simple to update all of the animal's information. It's simple to read the animal's details from an RFID tag using an RFID reader.



In this architecture, it explains the dataset loading of the wildlife movement into the application. The recorded wildlife is managed and processed to get the reports based on the user query.

IV. METHODOLOGY

4.1SVM Working

1. Determine the number of clusters (K).

2. Create centroids by shuffling the dataset and then selecting K data points at random for the centroids without replacing them.

3. Continue iterating until the centroids do not change. i.e. the clustering of data points does not change.Compute the sum of the squared distance between data points and all centroids.

- Assign each data point to the cluster that is closest to it (centroid).
- Calculate the cluster centroids by averaging all of the data points that correspond to each cluster.

4.2 KNN Working

Step 1 − We need a dataset to implement any algorithm. As a result, we must import the training data from the exam taken data list and the test data from the students who are currently taking tests during the first phase of KNN.
Test data set – Upload data based on user input dataset.
Train data set – collected data samples.
Step 2 − The value of K, i.e. the closest data points, must then be chosen. Any integer can be used as K.
The value k is taken from the test data set and serves as a centroid point.
Step 3 − For each point in the test data do the following −

- **3.1** − Calculate the distance between each row of training data and the test data using one of the following methods: Euclidean, Manhattan, or Hamming distance. The Euclidean method is the most widely used method for calculating distance.
- **3.2** − Sort the user's preference data in ascending order depending on the distance value.
- **3.3** − The top K rows of the sorted array will then be chosen.
- **3.4** − It will now assign a class to the test point based on the most frequently occurring segments from these rows' exam data.

Step 4 – End

4.3 Naive Bayes

1. for q = 1…w // loop for each mining models element
2. μ[q] = 0; // initialization of mining models elements
3. end for;
4. for j = 1…m // loop for each row
5. μ[d[j,p]]++; // increment number of row for value $x_{j.p}$ of object x_j;
6. for k = 1 …p-1 // loop for each column
7. $\mu[\varphi(k\text{-}1)+(d[j,k]\text{-}1)\cdot\varphi(0)+ d[j,p]]$++; // increment number of rows with value $x_{j.k}$ // and value $x_{j.p}$, where $\varphi(k)=s+\sum_{q=1}^{k}(|T_q|\cdot s)$
8. end for;
9. end for;

V. CONCLUSION

Modern IT technology, including as RFID, GPS, and sensor networks, is being used to investigate and develop a variety of intelligent application services. However, the aforementioned technologies must be integrated in order to provide more intelligent application services. There is a scarcity of technological integration in ecological research, particularly for animals and plants. As a result, we proposed an intelligent animal monitoring service for zoos and created a prototype combining RFID, GPS, and sensor technologies.RFID is used to identify animals and zookeepers, GPS is used to locate animals and cages, and sensor nodes are used to analyse animals' current state, such as their body temperature. The prototype has web-based open APIs that allow users to rapidly and easily access the system. Even if animals escape their cages, users can check the status of animals in the system remotely and monitor their current location using the open API.

REFERENCES

[1] Kahtan Aziz, SaedTarapiah, Salah Haj Ismail, Shadi Atalla --- Smart real-time healthcare monitoring and tracking system using GSM/GPS technologies, 28 April 2016
[2] Miss. PrajaktaSukumar Manakapure1, Prof. Mr. A. V. Shah2 --- Movement Monitoring of Pet Animal Using Internet of Things
[3] Prof. Joshi V. V. , Prof. Bhange S. S, Prof. Chopade S. S. "Wildlife Animal Location Detection and Health Monitoring System " International Journal of Engineering Research & Technology (IJERT) , Vol. 3 Issue 11, November-2014
[4] P. Keertana, Dr. B.Vanathi, K. Shanmugam, A Survey on Various Animal Health Monitoring and Tracking Techniques, Volume: 04 Issue: 02, Feb -2017
[5] R.B. Gaikwad, K.R. Pawar , R.P. Gaikwad , S.B. Gaikwad, Animal Health Monitoring System Using GPS & GSM Modem, Volume: 06 Issue: 03, Mar 2019
[6] Prof. Gujar. M. P. VileshaBhandirge, NamrataChavan, Shraddha Chavan Animal Tracking and Health Monitoring System using Zigbee, Vol. 6, Issue 02, 2018