iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** XI **Month of publication:** November 2020

DOI: https://doi.org/10.22214/ijraset.2020.32190

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue XI Nov 2020- Available at www.ijraset.com

Animal Health Smart Monitoring Device

Vaishnavi Singh[1], Shiksha Jain[2], Nupur Kesharwani[3]
[1]*Department of Electronic & Communication Engineering, RMLAU, Ayodhya, India*
[2]*Head of Department, Assistant professor, Department of Electronic & Communication Engineering, RMLAU, Ayodhya, India*
[3]*Assistant professor, Department of Electronic & Communication Engineering, RMLAU, Ayodhya, India*

Abstract: Every living thing on this earth has equal ecosystem significance. Nevertheless, biodiversity is now at risk. In the forest or jungle, wild animals moved freely. In the event of an accident in the forests or any illnesses in them, sometimes livestock in the woods may be destroyed. In these cases, the exact location of the animal in such a large area can not be determined. In the jungle, in national parks or in wildlife reserves, wildlife monitoring plans are employed to prevent these problems in identifying an exact geographic location for animals. The system uses technologies such as a global mobile communications positioning system and a global system.

Keywords: animal tracking, GPS, Health sensor, IoT , Neck collar.

I. INTRODUCTION

For a long time, both naturalists and animal research in animals and monitoring involved. The landscape, the geographical variability of animal husbandry, land use, animal efficiency and activity or social interaction in the group makes it possible to determine other important aspects such as the movement of animals for researchers to identify animals locations. The early animal positioning approaches focused on human observation of natural (colour pattern) or artificial (colour collar or tag) Properties. The topics that observers involved in these processes involved fatigue and related errors, physical limitations, external factors (weather and light) and the impact on the animals' behaviour as an observer nearby.

Since the late 1950s, the commercially available technology for the collection of location data was extremely high frequency tracking.

However, there are some limitations in VHF-based tracking systems that disturb the animal, so it only during the day, the soil will be pursued because of the difficulty.

Because of advances in the miniaturization of sensor technologies and the development of the higher energy density batteries, some devices allow the pursuit of smaller species, such as birds, are now available. But with actual devices, the size of the battery pack critical a threshold between the time resolution and the service life in the search.

Another major drawback of most early GPS-based systems was that the data was stored on board until the device remotely controlled by a radio-activated "break-away" mechanism or obtained by the recapture of the animal could be released. The development of mobile communication has the transfer and regular updating of location data via GSM / SMS or GSM / GPRS services activated. GSM services are widely used in Europe, but there are many large areas around the world, especially rural areas. Opportunistic sensor networks based on peer-to-peer routing, were used to store data to collect more animals when GSM services were not available.

However, the regular updating of information can be a challenge in this case. The Internet of Things (IoT) is a paradigm shift to improve the connectivity of the Internet.

It provides the technical feasibility of a large number of sensors, actuators and intelligent devices connected to it to stay that is crucial for the development of real-time or near-real-time applications. The requirements of IoT applications have driven the development of low-power wide area (LPWA) networks. They provide long-distance communication up to 10-40 km in rural areas and 1-5 km in urban areas.

It can be covered by a single base station an entire city or more businesses. In addition LPWA networks are very energy efficient and cost effective, with a radio chipset costs less than 2 € and an operating cost of 1 € per unit. Below it is expected that the 5.e. generation (5G) of wireless mobile communications will provide the opportunity to make an all-connected world of people and devices that would result for IoT applications.

Precision cattle to a global solution LPWAN manage farming (PLF) monitoring their health, welfare, production / reproduction and / or environmental impact objectives by continuous and real-time individual animals.

©IJRASET: All Rights are Reserved

II. LITERATURE REVIEW

We have summarized first on the smart agriculture and then monitor animal health. The results of this review are motivating future research and communication engineering, as well as contribute to data, information and communication management for animal welfare.

A. Animal Health Monitoring System with Raspberry Pi and Wireless Sensor

Explained in this chapter Author L.narayan [3], the creature health framework observed continuous monitoring of the creature parameters, Example rumination, body temperature next coterminous temperature and mugginess was manufactured. The system also includes the analysis of Stress levels animal in view of the thermal humidity Index. Raspberry Pi Model B + is used as the Web Server. Graphical representation is possible for the analysis Ruminating process and stress levels of the animals. GUI with PHP implemented.

B. Smart Computing and Sensing Technologies for Animal Welfare

Explained in this paper, author Admela Jukan [4]Homestead creatures is a lot of world food store network, and there are Enhancements shopper enthusiasm for course encouraged and compassionate raised domesticated animals, and how it affects our Well-being and ecological impression .He has checks intelligent technologies for pets, Indoor and outdoor animal breeding, as well as Animals in the wild and zoos. They have characterized creature welfare in nonexclusive Terms, perceiving that conditions judged serve solid to allow creatures to remain exempt spoiled and enduring, and also is strongly authorized in their state.

C. Advance Cattle Health Monitoring System With Arduino and IOT

In this paper, the author Meenakshi .M [5] explains the health Wireless Sensor Based cattle to influence monitoring system critical parameters includes cattle health, body temperature, Breathable, moisture, heartbeat and rumination be continuously monitored. These advanced cattle Health monitoring system can replace this manual processes the various diseases for recognition. This System is very useful for farmers and for doctors because it is just as a handbook Monitoring. Animals to fight the disease by sending the exact Layer in the form of the message is appended with link of Location near the animal welfare Organizations. So they get location information take animal with the help of GPS and the necessary measures. The Application user data including mobile number will Use of Fire Base is stored in the cloud. It reduces man Interference current and avoids in the search for the Location of the victim animal. This is every animal Charities can get short victim Period of time. This increases to save "s life the possibility of the animal that is in need of help. This application can prevent human animal conflict in cities, urban areas, densely populated areas in the country areas.

D. Smart Health Monitoring system for Animals

In this paper, author A. Patil [6] clarify propelled cows wellbeing checking framework for cows. Here sensors are utilized for identifying different wellbeing parameters of the bovine, as an example, body temperature, mugginess and breath then forth The sensors are interfaced with Arduino UNO and then it'll show the diagram on the graph application through ESP8266 Wifi module. This propelled cows wellbeing checking framework can swap this manual procedure for perceiving the different maladies. This framework is particularly useful for ranchers and furthermore for specialists since it's exact than manual perception. Verity objective to beat diverse therapeutic issues and issue associated with animal, we have proposed a splendid animal prosperity checking structure. This method includes diverse sensor modules which is able to upgrade the animal prosperity and their distinctive issues. The structure are useful for testing nonstop checking of blood heat, rumination and beat and also including temperature.

E. Ad-hoc Wireless Sensor Network in Studies of Animals well-being

In this paper, the author explains McCauley [7], it is to develop deployment and maintenance of the sensor easier arrange sensi cast DV used have been there. When Tiny DB with was big problems considerable amount of investigation. Sensi was cast moderately easy to line up and to maintain and worked in an ecological researcher. Something remarkably PC pad is accessible and versatile, acquisition application is arranged a TinyDB sufficiently apparatus for agrarian detection test. Where some critical PC strengthen access and an adaptable yet simple acquisition

Application is arranged, would be a TinyDB Satisfactory tool for rural detection tests.

Where capital expenditure is not most of the Point, and the processing ability is limited or in which complex sensor systems to be sent Sensi Cast DV would be the higher decision.

©IJRASET: All Rights are Reserved

F. Internet of Things (IoT) Enables Smart Pet Farm

Explain the above titled paper, author Menon [8] The systematic implementation of automatic Smart Animal farm which monitors and controls the Animal health parameters. The process uses Sensors. The process by means of sensors, which allows automatic feeding, watering and exhaustingto protect access biogas and farm and animal Hof. System includes the first module includes water level sensors, bio-sensor, Temperature and humidity sensors. Farm sensor and two microcontroller sensory system and send it with a parameter IP users and perform appropriate function of real-time automatically. This intelligent system should do Monitoring of the entire farm. The elegant farm cultivating includes subsystems consists of bio Gas control framework, feed control framework, Hatchery control system, IP camera, fire Divorce frame and water control Frame.

G. Smart Farm Computing System for animal Welfare Monitoring

In this paper the author Marcel Caria [9] explains the system of animal welfare. The farm controller is middle part of the overall system architecture, tie layer between cloud and edges

A low-cost and open computing and The sensor system can effectively for multiple monitors

Parameters for animal welfare in the context of this paper two types of sensors are used portable and not portable. The portable sensors are on the solid animal body movements and to the sending farm workstation.The sensors measure multiple values as Temperature Humidity. The farm controller receives all measurements to evaluate if and classifies them.

1) Problem Formulation

a) In order to develop a system that is able to measure the Body temperature, rumination, moisture and heart rate Parameters with the environmental conditions, overcome various health problems and problems related to Animal."
b) The ranchers livestock faced health problems around the world due to the continuous rise in air temperature in the troposphere.
c) Difficult in many animals to monitor in agriculture.
d) Wireless data transmission is a challenge, rural in most areas.
e) The financial cost of GPS tracking systems (usually several hundred euros per unit).
f) Difficulties in Rescuing during natural disaster.

2) Objectives

a) Animal like we do not speak. So they can not say, and their problems or sick situation share. So, in order to monitor their physiological parameters such as temperature, humidity, heart rate, Ruminate etc.
b) Recently, faced various farmers livestock health problems in the world because continuous increases in air temperature in the troposphere. To avoid such problems we have proposed Animal Health Monitoring System.
c) The main objective of this proposal work is to develop a cost-effective solution that allows monitoring of the location of all animals in a herd and the continuous updating of the location data required for farmer decision support.
d) The secondary objective is to test the real performance of the solution on commercial enterprises with different production conditions.
e) A further aim of this proposal work, to save the rare category animals.
f) Another aim of this work is the smart watch on animals health.

III. METHODOLOGY

In this proposal work, a systematic literature review (SLR) will review selected protocol for papers from the most reliable sources. The SLR is often specifically find, interpret and to consider these research results, which had formulated research questions addressing. provided mainly the impact / support, lookup work, applications and security elements of IoT healthcare gadget technological know-how have been considered. The line of research was first-class assessment for the purpose of analysis of learning to be recognized over the fantastic healthy results. The look-up followed the SLR to the questions due to the fact a predefined protocol is reduce the possibility of bias researchers to address an integral part. The top center of attention an SLR is the implementation discover a comprehensive evaluation of studies Covered in a particular environment, the gaps in the current look with the intention also to look into and provide the depth perception of the new phenomenon.

To avoid all the above problems with the animals health and places, we proposed a project, known as "Animal Smart Health Monitoring Device ". In this proposal a GPS modem helps the coordinates of the location to obtain. This modem can requires minimal 3 satellite Global Positioning System Modem location parameters such as length and width receives from the satellite.

©IJRASET: All Rights are Reserved

We have GSM modem be used in addition that although SMS sends these parameters to specific cell number. These cell number can be from a forest officer or any government agency involved person. This SMS is the precise location of the animal music help. And if the animal then the exact location variable parameters received. We moves into the wildlife reserves or forest also includes a temperature sensor, a coronary heart beat sensor and a blood press your and add many different units in Nano measuring in this project. If the animal has a fever, or if there are some wounds on animal body and due to the fact of wounds temperature rises of animal, then we can send SMS to the forest officer, so that he can provide the attention immediately. This SMS message content material like "temperature threshold level crossing" and this message also contains GPS coordinates.

In this system, we are micro-fitness equipment such as tickr, two FitBit Surge, Forerunner 920XT, add iBGSta. This obligation should be attached to the animal's body. Just as animal moves from one place to another, coordinate the GPS is trade and this trade is the use of text messages are indicated. We can receive regular SMS to the mobile number of the officer.

Talking about the current universities in some countries have many animals belt in the neck. This belt has a wireless transmitter. A flora and fauna officer receiver looking her hand and location in his /. However, the most important disadvantage of this method is that range of wireless transmitters less. In some sensors, it is a hundred meters in some sensor in a few kilometers, but not anymore. But as we know that the forests and nature know national parks, thousands of kilometers in length. And in such conditions these wireless transmitters are now not much useful and they are time consuming. With the aid of GPS technology and GSM technology, we can an animal in the forest of thousands kilometres in length. For retrieving we have used GPS modem and latitude and longitude of the location.

IV. OVERVIEW OF BLOCK DIAGRAM

1) *GPS Modem:* The GPS modem communicates using serial verbal exchange with the microcontroller. GPS modem sends a series of records to the microcontroller. This set of data consists of many parameters include the length and width.
2) *Temperature Sensor:* We want to tell the vital sign of the animal. The temperature sensor is an Analog sensor. Which skill it gives variable voltage consistent with the variation of the temperature of the body. The temperature sensor is one which senses the temperature and measure. It is used to the environment and the body both any animal. For conventional work in any system, the temperature must be at steady state. If there is any variation in it, a patient shows health occurred and cause some serious health cattle. The temperature sensor is used to observe the temperature of cattle. In the same way, other temperature sensor is used to display the temperature of the environment surrounding cattle. Body will work only properly specified temperature. The normal temperature ranges cattle 101.5 ° F (38.6 ° C). various temperature sensors are thermistors, LM35, a temperature sensor IC.
3) *Humidity Sensor:* It is also known as a hygrometer. The water present in the air is only moisture. the amount of vapour present in the air actually It affects the health of humans, as well as the health of livestock. Since metabolism is low and several behaviour were placed with moisture should be properly supervised. Humidity sensor is used to calculate the change occurred in the environmental conditions. proportion It should be between 30% to 70%. Various humidity sensors are there. AM1001 is an analog sensor humidity.
4) *Pulse Sensor:* Heart rate is one in each of the important parameter when health is monitored. Indicates stress and irritation occurred to any animal Body. Variation occurred in the heart typically shows stress, anticipation, movement, effort and various diseases. Normal pulse between 48-84 beats per minute in cattle. There are many pulse sensors and Polar Tester (PST), PC-3147.
5) *Arduino Pro Mini:* Pro Mini Arduino usually has the same microcontroller (MCU) as the Arduino Uno, the Atmel ATmega328P. Because MCU is the same, the speed and memory size are the same. The Mini Pro also has the same pins I / S as the One. The main difference between the Arduino Uno and Mini Pro is its size. This is the major block of this project. It carried out various functions such as reading the GPS coordinates of the modem. He learns the longitude and latitude of this data. Sends commands to the GSM modem for sending SMS.
6) *IOT Sensors:* At this point, the IO sensors are being employed to constantly check and record their health status and send warnings if any prerequisite irregular has been found. If some minor problems were detected, the software can defend itself IO also sufficient to cure the patient. the subsequent sections include variety of application. supported the IO support monitoring and control of health limitations like force per unit area (BP), haemoglobin (Hb), the stage of blood glucose, and also the development of irregular cells approach is proposed. Health care service supported one IO is proposed to detect pressure, diabetes and weightness.

©IJRASET: All Rights are Reserved

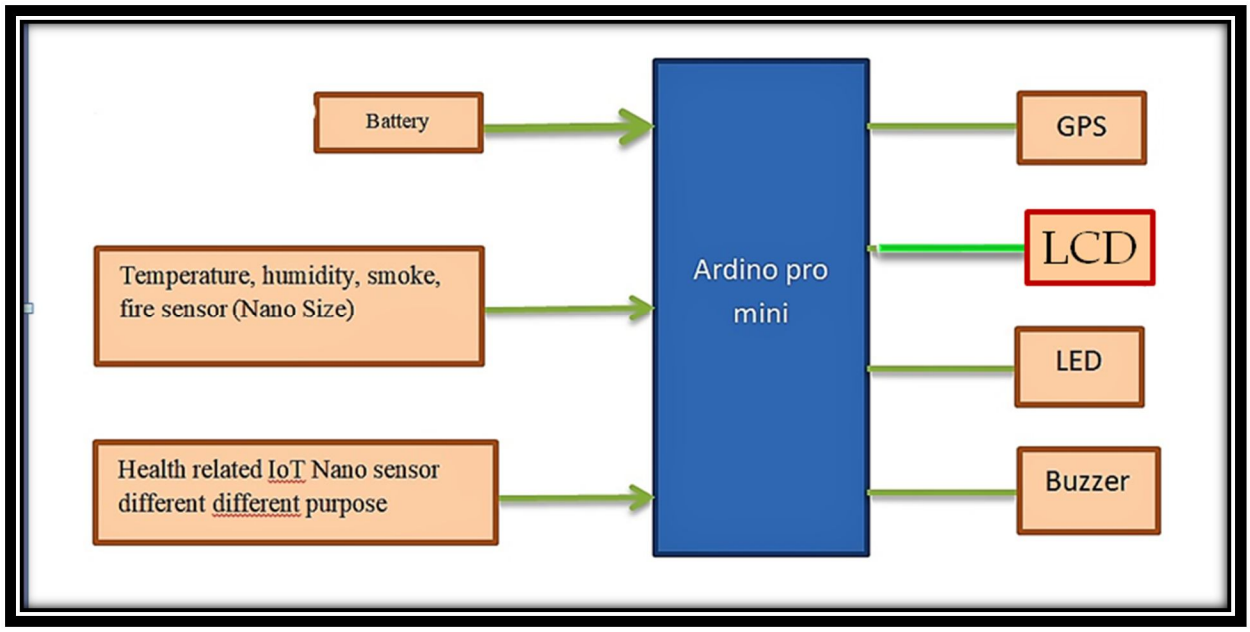


Figure:1 Block Diagram For The Proposed System

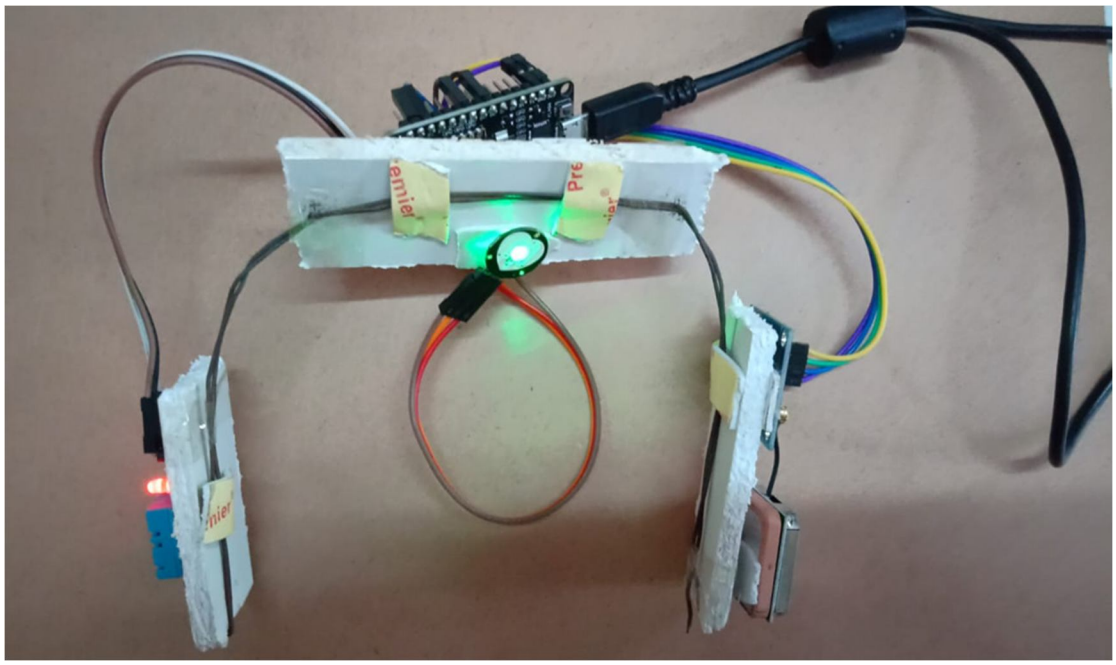


Figure:2 Designed System In a Collar Shape

V. APPLICATIONS

A. The project is to monitor the situation of animals in zoo and home. This project uses a GPS modem and a cellular modem. The owner receive this text in length and width.
B. This project can also be helpful for further studies on animals behavior.
C. Regularly check the animal health without hosptial.
D. In order to improve animal health or minimize the Cattle health problems.
E. This system will be used in veterinary clinics.
F. It has an important social impact in the field of animal health surveillance and to minimize animal diseases.
G. Medical improvement for animal health.

©IJRASET: All Rights are Reserved

VI. FUTURE SCOPE

The future of this paper will be in the hardware also to develop a portable device that can be connected to one, Device IoT use. But since the portable device as a serious threat is to the security can have, the device can be from the animal's "body removed and may result in theft. And can be placed so that an intelligent theft detection system or alarm on the hardware of the user and sends a notification to your device in case if to alert someone baskets with the portable device.

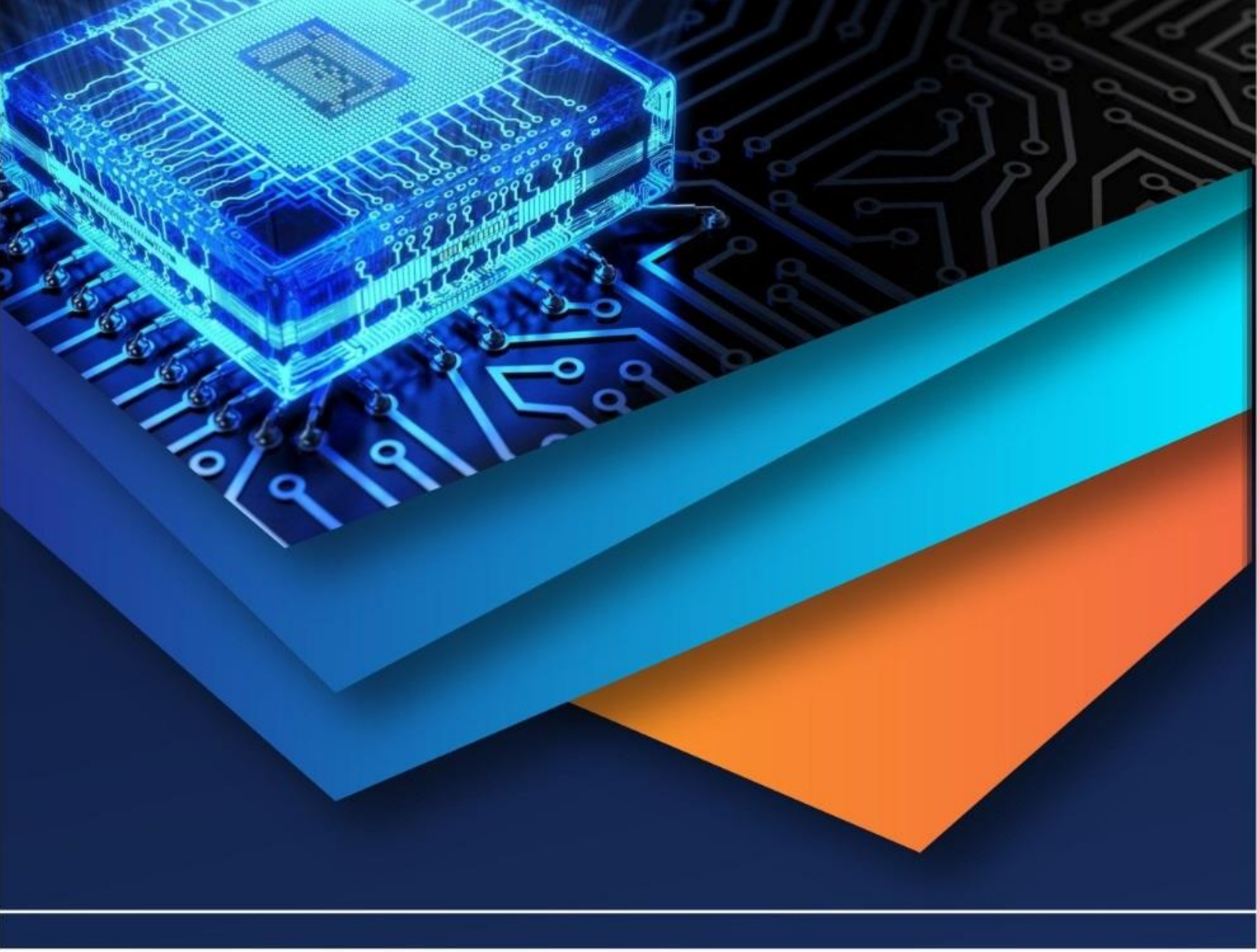
VII. CONCLUSIONS

In this paper, we gave a literature Review study of various systems implemented for Animal health surveillance through their used Techniques and benefits. The system is useful for the examination of animals real bodies Temperature and surrounding shed Temperature. It reduces men power and avoids interference in the place of discovery Sacrificial animal The whole premise can to meet when frame made by IOT concepts. So IOT Animal Foundation "Health observed Frame is above striking Conditions. We show that a low-cost and open system can effectively for multiple monitors relevant parameters for the animal health surveillance System of sensors.

REFERENCES

[1] http://movie.adworms.in/jgeecnryg/iot-gps-tracker-project.html
[2] Forest Monitoring System Using Wireless Sensor Network B S Sudha1 Yogitha H R2 Sushma K M2 and Pooja Bhat2 April, 2018.
[3] L. Narayan, Dr. T. Muthumanickam and Dr. A.Nagappan,"Animal Health Monitoring System using Raspberry Pi and Wireless Sensor", International Journal of Scientific Research and Education (IJSRE), Volume 3 Issue 5, May 2015 Digital Information Processing and Communications (ICDIPC),
[4] A. Jukan, X. Masip-Bruin and N. Amla, "Smart Computing and Sensing Technologies for Animal Welfare: A Systematic Review",CoRR, http://arxiv.org/abs/1609.00627, 2016
[5] Meenakshi .M, Snehal. S. Kharde „Advance Cattle Health Monitoring System Using Arduino and IOT",IJAREEIE,vol.4.,2016.
[6] A. Patil, C. Pawar, N. Patil and R. Tambe, "Smart health monitoring system for animals", 2015 International Conference on Green Computing and Internet of Things (ICGCIoT), October 2015.
[7] I. McCauley, B. Matthews, L. Nugent, A. Mather and J. Simons,"Wired Pigs: Ad-Hoc Wireless Sensor Networks in Studies of Animal Welfare", The Second IEEE Workshop on Embedded Networked Sensors, 2005. EmNetS-II., May 2005.
[8] M. H. Memon, W. Kumar, A. Memon, B. S. Chowdhry, M. Aamir and P. Kumar, "Internet of Things (IoT) enabled smart animal farm", 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, 2016, pp. 2067-2072
[9] Marcel Caria, Jasmin Schudrowitz, Admela Jukan and Nicole Kemper ,"Smart Farm Computing Systems for Animal Welfare Monitoring "MIPRO 2017, May 22- 26, 2017, Opatija, Croatia."
[10] Internet of Things for Healthcare Using Effects of Mobile Computing: A Systematic Literature Review.
[11] Estimation of location: global coverage using light intensity, Wilson R.P., Ducamp J., Rees W.G., Culik B.M., Niekamp K., in Wildlife Telemetry: remote monitoring and tracking of animals, Priede I.M., Swift S.M. (eds), Ellis Horward, Chichester, p131-134, 1992.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)