



Animal Tracking and Temperature Monitoring Using IoT

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ABSTRACT

This project envisages the rapid advancement of the Internet of Things has revolutionized the way animal health and behaviour are monitored in wildlife conservation, livestock farming, and pet management. This paper presents the development and implementation of an Animal Tracking and Temperature Monitoring System using IoT to provide real-time insights into animal location, movement patterns, and vital health metrics, particularly body temperature. The system integrates GPS-enabled tracking devices and temperature sensors with IoT connectivity, enabling remote monitoring and data analysis through cloud-based platforms. The proposed system is designed to address several key challenges, including the need for continuous animal monitoring, early detection of health issues, and efficient resource management in livestock farming. By leveraging IoT technology, farmers, conservationists, and pet owners can track animal location, detect abnormal temperature fluctuations, and respond swiftly to potential threats such as illness, stress, or environmental hazards

Keywords: Temperature sensor,GSM,GPS,,Ardiuno NANO

1. INTRODUCTION

In recent years, the integration of the Internet of Things into wildlife conservation, livestock management, and pet care has opened up new avenues for monitoring and tracking animal health, behavior, and location. An Animal Tracking and Temperature Monitoring System using IoT is one such innovation that enhances the ability to monitor animals in real-time, ensuring better care, safety, and management. Animal tracking involves the use of IoT-enabled devices to gather data on an animal's location, movement patterns, and sometimes other biological metrics. Using technologies like GPS (Global Positioning System), RFID (Radio Frequency Identification), or other sensor-based systems, IoT devices attached to animals (collars, implants, or tags) can communicate location data to a central hub or cloud platform. Temperature monitoring is crucial for the health and well-being of animals, especially in extreme climates or when managing disease outbreaks. IoT sensors can monitor the body temperature of animals or the environmental temperature of their habitats. Abnormal temperature readings can indicate health issues such as infections, stress, or heat/cold exposure.

2. LITERATURE SURVEY

E. Pereira et al., 'RFID Technology for Animal Tracking: A Survey,' in IEEE Journal of Radio Frequency Identification, vol. 7, pp. 609-620, 2023, doi: 10.1109/JRFID.2023.3334952. The application of animal tracking holds significant importance across diverse economic domains, encompassing sectors including livestock husbandry, agricultural practices, and the conservation of wildlife populations. It aims to track and understand animal behavior, movement patterns, and health status. The predominant use of RFID technology is observed within the domains of logistics, localization, and the tracking of goods. Notably, the application of this technology in the field of animal tracking has experienced a significant surge in popularity in recent years. This paper conducts a systematic literature review focused on understanding how RFID technology is being applied in the field of animal tracking. We have conducted a state-of-the-art research regarding animal tracking solutions in the scientific literature and patents. We have analyzed these solutions targeting which animals are being tracked, which problems are addressed, operating frequency, and whether other technologies are combined with RFID for animal tracking purposes. Among the categories of problems addressed, livestock management emerged as the main area, followed by animal tracking and traceability. Mammals, especially cattle, are the most common type of animal monitored. Considering RFID technology, passive UHF tags appeared more often. Moreover, many works also employed cameras and GPS together with RFID..

3. BLOCK DIAGRAM

The block diagram for the animal tracking and temperature monitoring system using IoT consists of five key components: Power Supply, Temperature Sensor, Arduino Nano, GSM Module, and GPS Module. The Power Supply provides the necessary energy to the entire system, ensuring all components are operational. The Temperature Sensor is connected to the Arduino Nano and is responsible for continuously monitoring the animal's environmental temperature. The GPS Module also interfaces with the Arduino, tracking the real-time location of the animal. The Arduino Nano acts as

the central controller, processing the temperature and location data, then communicating with the GSM Module to transmit the information wirelessly to a remote server or mobile device. This setup allows real-time monitoring of both the animal's location and its surrounding temperature, making it ideal for wildlife tracking. The combination of these components creates a robust IoT-based animal tracking system. The process begins with the power supply activating the entire system. The temperature sensor constantly measures the ambient temperature, while the GPS module tracks the animal's movements. The Arduino Nano, acting as the system's brain, processes this data and relays it to the GSM module for transmission. The GSM module then sends this data to a remote server, cloud storage, or mobile device, where it can be monitored and analysed in real time. The system's ability to provide continuous data on both the animal's location and surrounding environmental temperature makes it particularly useful in wildlife conservation efforts, where tracking and ensuring the safety of animals in the wild is critical. For domestic animals, it can help prevent them from straying too far or encountering unsafe environmental conditions.

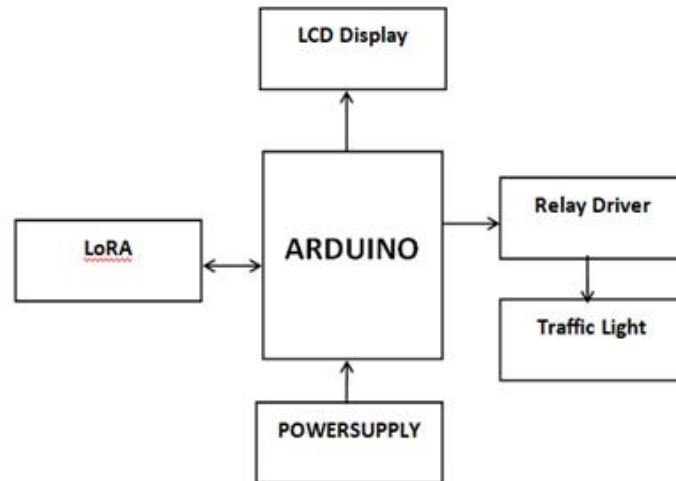


Figure 1: Animal tracking and temperature monitoring using iot

4. SIMULATION DIAGRAM

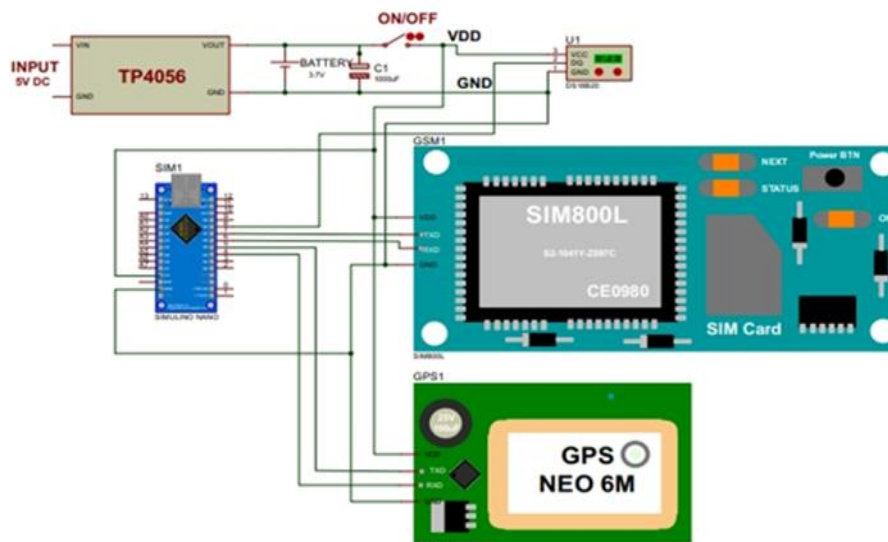


Figure4: Animal tracking and temperature monitoring using iot

5. CONCLUSION

In this report work the integration of IoT technology into animal tracking and temperature monitoring systems revolutionizes how animal health, movement, and environmental conditions are monitored, Real-time data collection becomes seamless and more efficient.

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