



## **IOT Based Wildlife Monitoring System**

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### **ABSTRACT-**

The use of technology in wildlife conservation has been gaining momentum in recent years. One such technological solution is virtual fencing, which is a system that uses sensors and GPS to create an invisible boundary around an area. The system can be used to monitor the movement of wildlife and prevent them from entering areas where they may be at risk, such as highways or urban areas. In addition to virtual fencing, technology can also be used to monitor deforestation and provide notifications when illegal logging activity is detected. This can help conservation organizations and law enforcement agencies to quickly respond to threats to forest ecosystems and take action to protect them. The combination of virtual fencing and deforestation monitoring technology can be a powerful tool in the fight to protect wildlife and their habitats. By using these tools, conservationists can better understand animal behaviour and take steps to mitigate human impact on ecosystems.

### **I. INTRODUCTION**

The destruction of wildlife habitats due to human activity has led to a significant decline in biodiversity. As such, conservation efforts have become increasingly important in recent years. Technology has been identified as a powerful tool in conservation efforts, and two such technologies are virtual fencing and deforestation monitoring. Virtual fencing is a system that uses sensors and GPS to create a boundary around an area. The system can be used to monitor the movement of wildlife and prevent them from entering areas where they may be at risk. This can be particularly useful in preventing wildlife from entering areas where they may be at risk of being hit by vehicles or becoming a nuisance to humans.

Deforestation monitoring is another important technology that can be used to protect wildlife habitats. Deforestation is a major threat to biodiversity, and monitoring this activity is crucial in conservation efforts. Technology such as remote sensing and satellite imagery can be used to detect changes

in forest cover, while ground-based monitoring using sensors and cameras can be used to detect illegal logging activity. **Benefits of Virtual Fencing:** Virtual fencing has several benefits over traditional physical fencing. Unlike physical fencing, virtual fencing does not require any physical barriers, meaning that animals can move freely within their natural habitats. This is important because it allows animals to maintain their natural behaviors and interactions, while still being protected from harm. Virtual fencing can also be used to monitor animal movement, providing important information on their behavior and habits. This can help conservationists make informed decisions about how best to protect wildlife habitats. **Benefits of Deforestation Monitoring:** Deforestation monitoring is also an important technology in conservation efforts. By monitoring deforestation, conservationists can identify areas where intervention is necessary to protect the forest ecosystem. This can help to prevent the loss of biodiversity and the disruption of natural habitats. Monitoring deforestation can also be used to identify areas where illegal logging activity is taking place. This information can be shared with law enforcement agencies, allowing them to take action to stop the illegal activity and protect the forest ecosystem. virtual fencing and deforestation monitoring are important technologies in wildlife conservation efforts. They can be used to protect wildlife habitats and prevent the loss of biodiversity. While there are challenges associated with these technologies, including potential costs and difficulties in implementation, with careful planning and integration with existing conservation efforts, they have the potential to greatly enhance conservation efforts and promote the long-term sustainability of our planet's natural resources.

### **II. PROPOSED SYSTEM**

The proposed system for wildlife monitoring, virtual fencing, and deforestation notification would involve the integration of several technologies to create a comprehensive conservation solution. The system would involve the use of sensors, GPS, remote sensing, satellite imagery, and camera traps to monitor wildlife movement, create virtual boundaries, and detect changes in forest cover. **Virtual Fencing:** The virtual fencing component of the system would involve the use of GPS collars or tags attached to animals. These collars or tags would communicate with a network of sensors placed around the area, creating a virtual boundary. When an animal approaches the boundary, the sensors would emit a signal that would deter the animal from crossing. The

virtual fencing component would be particularly useful in areas where wildlife and humans interact, such as roads or residential areas. By preventing animals from crossing into these areas, the virtual fencing would reduce the risk of animal-vehicle collisions and the potential for human-wildlife conflict.

**Wildlife Monitoring:** The wildlife monitoring component of the system would involve the use of GPS collars or tags, camera traps, and other sensors to monitor animal movement and behaviour. This information would be used to create a database of animal behaviour and habitat use, allowing conservationists to make informed decisions about how best to protect wildlife habitats. **Deforestation Monitoring:** The deforestation monitoring component of the system would involve the use of remote sensing and satellite imagery to detect changes in forest cover. This information would be used to identify areas where deforestation is occurring and to track changes over time. Ground-based monitoring using sensors and cameras would also be used to detect illegal logging activity. This information would be shared with law enforcement agencies, allowing them to take action to stop the illegal activity and protect the forest ecosystem.

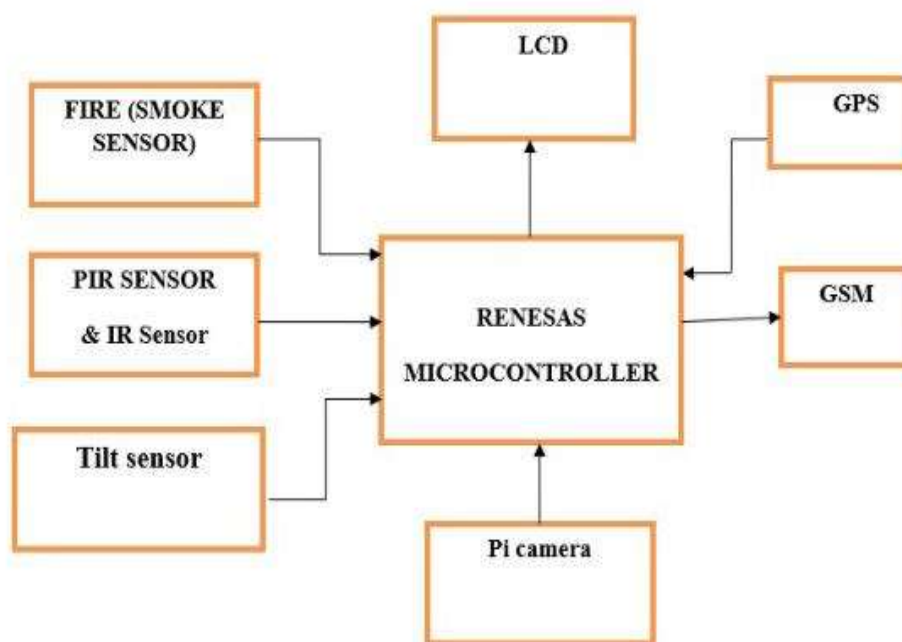


Fig 1 Block Diagram

**Notification System :** The notification system component of the system would involve the use of alerts to notify conservationists and law enforcement agencies of potential threats to wildlife habitats. These alerts could be triggered by the virtual fencing system, the wildlife monitoring system, or the deforestation monitoring system. For example, if an animal approaches the virtual fence boundary, an alert could be sent to conservationists to notify them of the animal's presence. If illegal logging activity is detected, an alert could be sent to law enforcement agencies to take action. The proposed system for wildlife monitoring, virtual fencing, and deforestation notification would involve the integration of several technologies to create a comprehensive conservation solution. By combining virtual fencing, wildlife monitoring, deforestation monitoring, and a notification system, conservationists and law enforcement agencies would have the tools necessary to protect wildlife habitats and promote the long-term sustainability of our planet's natural resources. While there are challenges associated with implementing this system, including the cost of technology and the need for careful planning, the benefits to wildlife and ecosystems make it a worthwhile investment.

### III. LITERACY SURVEY

[1] "Internet of Things: Wildlife Conservation and its Challenges" Prof. Ratnesh Kumar Choudhary is an expert in the field of wildlife conservation and the Internet of Things (IoT). He has conducted extensive research on the use of IoT in wildlife conservation and the challenges associated with its implementation. In his work, he highlights the potential of IoT to improve conservation efforts, but also the need for careful planning and consideration of ethical issues. Possible solutions.

[2] "Forest Monitoring Unit and Traveller Safety Gadget Using Wireless Sensor Network" S. Manasa<sup>1</sup>, K. A. Anusha<sup>2\*</sup>, M. B. Bhavyashree<sup>3</sup>, N. Chaitanya<sup>4</sup>, M. K. Pooja<sup>5</sup>, discusses the development of a system to monitor forest areas and provide safety measures for travellers using wireless sensor network technology. The system consists of sensor nodes that collect and transmit environmental data, such as temperature, humidity, and sound levels, to a central node that processes and analyses the data.

[3]"Human Safety in Farm from Wild Animals" Arpita Roy<sup>1</sup> , Vaishnavi Jadhav<sup>2</sup> , Manali Jiwane<sup>3</sup> , Shaily Kamble<sup>4</sup> , Prof.Namrata D. Ghuseaddresses the issue of human safety in agricultural areas where there is a potential threat from wild animals. The paper highlights the need for measures to prevent animal attacks and protect farmers and farm workers from harm.

[4]"IoT based Animal Health Monitoring & Tracking System using ZigBee" P.Keertana,presents a system for monitoring and tracking the health of animals using Internet of Things (IoT) technology and ZigBee communication protocol.The proposed system consists of a sensor node attached to each animal that collects data on the animal's health parameters, such as body temperature, heart rate, and activity level.

#### IV. RESULT

The use of virtual fencing in wildlife monitoring can help reduce the impact of deforestation and provide an effective means of notifying authorities when wildlife is endangered. Virtual fencing involves using technology, such as GPS tracking and sensors, to create a virtual boundary that animals cannot cross. This can be used to create wildlife corridors, which help maintain connectivity between fragmented habitats and increase biodiversity.By monitoring animal movements through virtual fencing, researchers and wildlife conservationists can gain insights into animal behavior, habitat use, and migration patterns. This information can be used to inform conservation and management strategies, such as identifying areas where deforestation should be avoided or restricted to reduce the impact on wildlife populations.

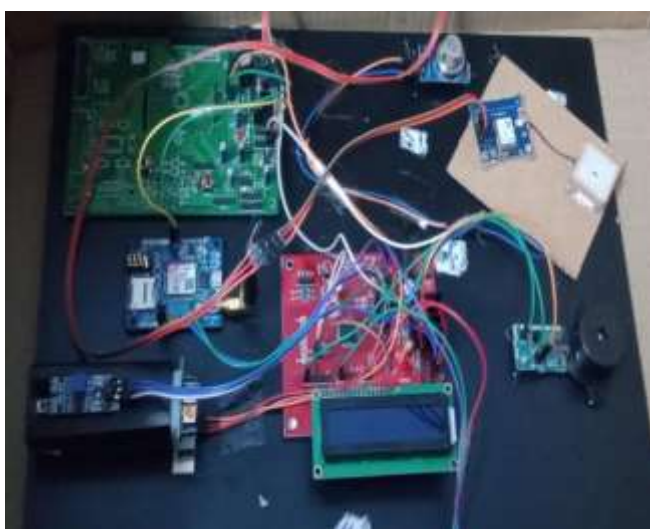


Fig 2 Experimental set

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$#FIRE@
LA,,,,,120LG,,N*74
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LA,,,,,120LG,,N*74
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LA,,,,,120LG,,N*74
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$#FIRE@
LA,,,,,120LG,,N*7B
$#TREE_FALL@
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Fig 3:GSM Output

Virtual fencing can also be used to provide real-time notifications to authorities when animals are endangered. For example, if a protected species crosses a virtual boundary, an alert can be sent to park rangers or other officials, who can respond quickly to protect the animal.Overall, the use of virtual fencing in wildlife monitoring can help mitigate the impact of deforestation on wildlife and provide an effective means of notifying authorities when animals are in danger.

#### V. C0NCLUSION

In conclusion, wildlife monitoring, virtual fencing, and deforestation notification are important tools for conservation efforts to protect natural habitats and wildlife. These technological approaches help us understand animal behavior and populations, create barriers to prevent wildlife from accessing dangerous areas, and detect changes in forest cover to prevent illegal logging and habitat destruction. By utilizing these tools, we can work towards preserving the health of ecosystems and maintaining biodiversity, ensuring the continued existence of these precious natural resources for future generations.

#### VI. REFERENCES

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