



## **Department of Computer Science and Engineering**

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**IT23A31 -IOT**

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**ANIMAL DETECTION SYSTEM**

**SURYA NIRANJAN S - 230701354  
SAKTHI ADITHYA E S - 230701398**

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# ABSTRACT

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The Animal Detection System is an IoT-based solution designed to identify the presence of animals in specific areas using sensor and camera technology. This system aims to prevent human-animal conflicts, reduce crop damage, and enhance safety in rural and forest-adjacent regions. It utilizes motion sensors, thermal imaging, or machine learning-based object detection models integrated with microcontrollers and wireless communication modules to detect and alert users in real time. Notifications are sent via mobile or web applications, enabling quick response and monitoring. This project showcases the practical application of IoT in wildlife monitoring, agriculture, and smart surveillance.

# Introduction

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- In many rural and forest-bordering regions, the intrusion of wild animals poses a serious threat to crops, property, and human safety. Traditional surveillance methods are often manual, time-consuming, and lack real-time responsiveness, making it difficult to prevent damages effectively.
- To address this problem, our project introduces an IoT-based Animal Detection System that combines motion sensors, cameras, and wireless communication to automatically detect animal movements and send real-time alerts to users. This smart and scalable solution enhances security, reduces losses, and supports better coexistence between humans and wildlife.

# Problem Statement

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Unmonitored animal intrusions in agricultural fields and human habitats near forest areas often lead to crop damage, property loss, and even threats to human life. Existing monitoring methods are largely manual, lack real-time detection, and are not scalable for continuous surveillance. There is a need for an automated, efficient, and real-time system to detect the presence of animals and alert users promptly to minimize damage and ensure safety.

# Proposed Work

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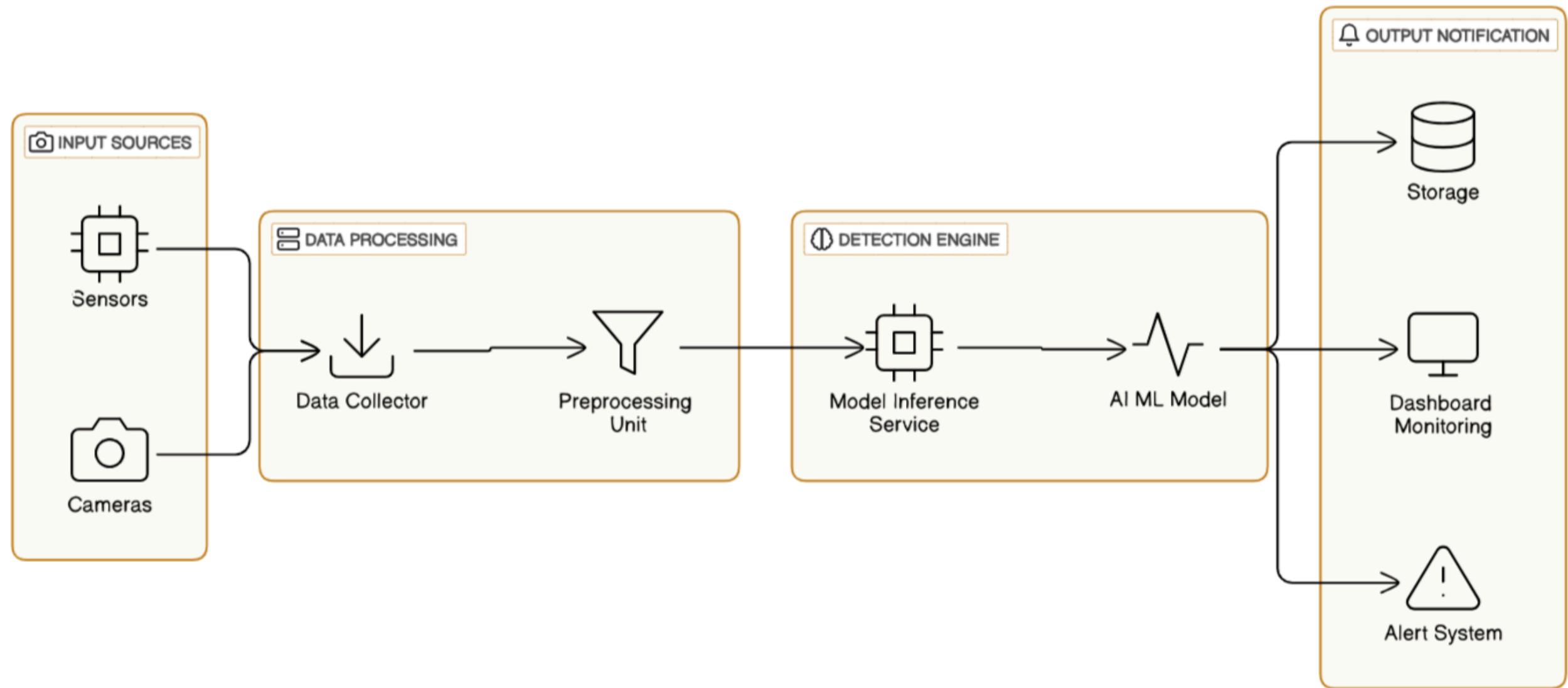
The proposed work for the Animal Detection System involves designing and developing an IoT-based solution to monitor animal movements in rural and forest-adjacent areas. The project will begin with analyzing the requirements and selecting appropriate components like motion sensors (PIR/Ultrasonic), a camera module, and a microcontroller (ESP32/Raspberry Pi). The system will integrate these components to detect motion, capture images, and send real-time alerts via an IoT platform (ThingSpeak/Firebase). After hardware setup and programming, the system will be tested and calibrated for accuracy. Upon successful testing, the system will be deployed in real-world environments, with potential future enhancements such as machine learning-based animal recognition and improved power efficiency.

# Implementation

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- The system was built using an ESP32 microcontroller integrated with a PIR motion sensor and a camera module. When motion is detected, the camera captures an image of the detected entity. The ESP32 processes the input and prepares it for transmission.
- The captured data is sent to an IoT platform such as ThingSpeak or Blynk via Wi-Fi. From there, real-time alerts and images are delivered to a mobile app or web dashboard, allowing users to monitor animal activity remotely and respond quickly to potential threats.

# Architecture



## **System requirements**

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- ESP 32 Microcontroller
- Ultrasonic sensors
- PIR sensor
- Buzzer

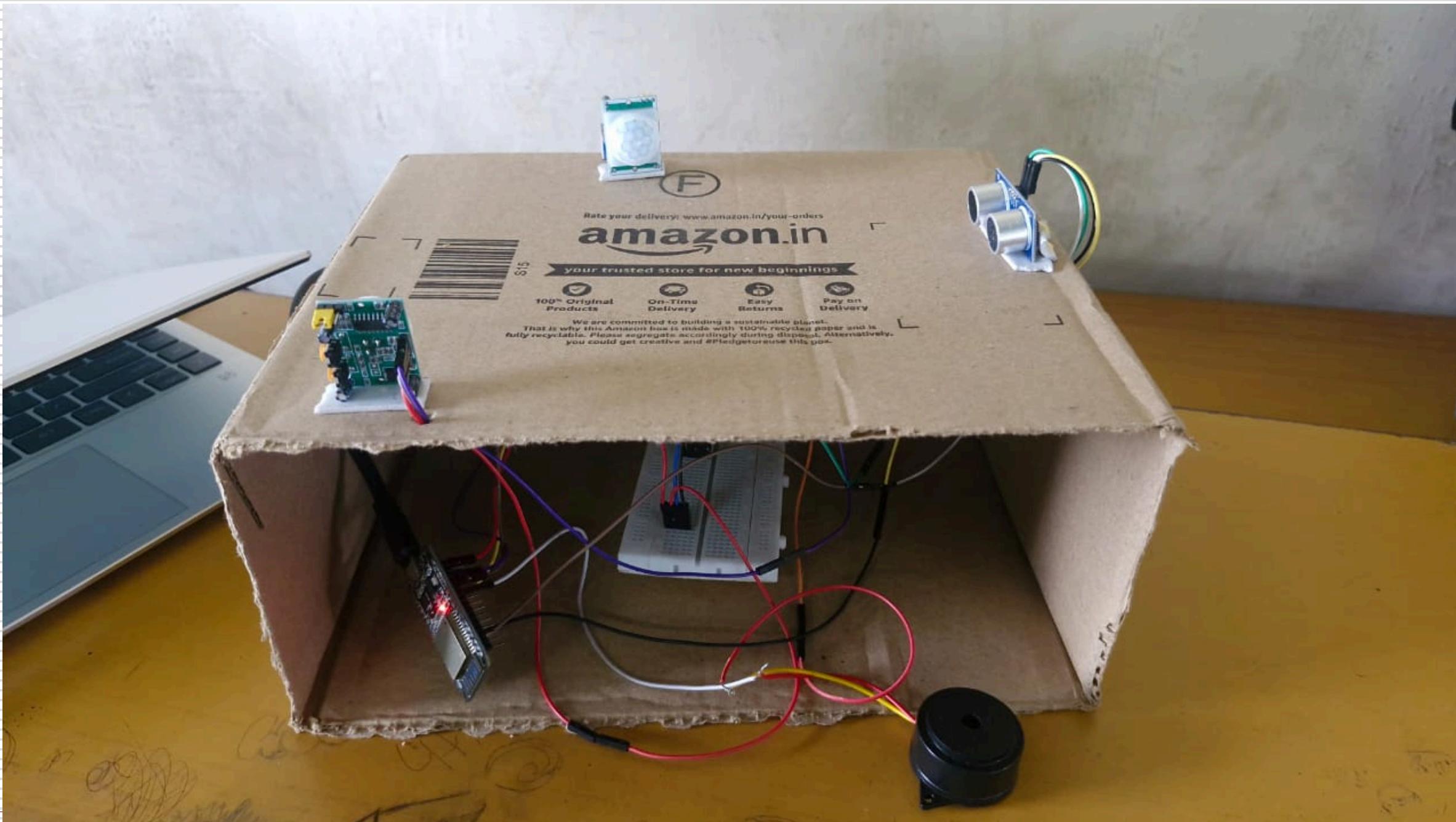
# **Advantages of the proposed system**

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- Real-Time Detection and Alerts.
- Enhanced Safety.
- Automation and Remote Monitoring.
- Cost-effectiveness.

# ANIMAL DETECTION SYSTEM

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IOT Mini-Project

# Implementation

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- When the PIR sensor detects motion, it sends a signal to the ESP32. The ESP32 processes this input and executes predefined actions—such as logging the event, activating alerts, or sending data to the cloud.
- Leveraging the built-in Wi-Fi capability of the ESP32, the system connects to an IoT platform (such as Blynk, Firebase, or ThingSpeak). This allows the system to push real-time alerts and data to the cloud without any external module

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# Conclusion

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The Animal Detection System successfully demonstrates the potential of IoT technology in addressing human-animal conflicts and protecting agricultural assets. By integrating motion sensors, cameras, and real-time IoT monitoring, the system can detect animal presence and alert users instantly, ensuring quick response and minimizing damage. This project not only enhances safety and efficiency but also showcases the practical application of IoT in wildlife monitoring. Future enhancements like machine learning for improved animal identification and energy-efficient solutions can further elevate the system's capabilities, making it a scalable and reliable tool for various environments.



**THANK YOU**

