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Android and IoT Integrated Smart Wildlife Surveillance using Night Vision

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Abstract: *Animal are important part of our ecosystem. Animal are very critical to our ecosystem. Due to increase in animal trafficking many wild animal are becoming endanger and also there population is decreasing. Because of this humans have created zoo, national park and sanctuaries which can work as safe heavens for these animal to avoid extinction. There can be scenario where animal are ill or poor health condition which can be a also cause of the death. Many people visit national park and sanctuaries where they are not able to see all animal. This project will be implement in python and will implement YOLO V7 algorithm to detect animals. Once animal is detected it will send name and GPS co-ordinates of the animal. These GPS co-ordinates will display on mobile and farmer can find animal at given location. This project can also be placed in farm land where human and animal conflict are common. If animal is detected it can send alert or sound can be generated to distract it. This project will help detection on wild animal using camera and deep learning technology. Android app will be used to locate the animal on google map..*

Keywords: GPS, YOLO V7, Android App, Animal

I. INTRODUCTION

Advanced Wild Animal Detection and Alert system using you look only once version 7 (YOLO V7) model is a proposed examine the pic and hit upon the presence of untamed animals. If the machine detects the presence of any wild animal, it sends an alert to the government via an alarm or message. The proposed system is anticipated to provide an effective approach to prevent any capacity damage due to wild animals and help maintain wildlife by using lowering human -animal war. The superior Wild Animal Detection and Alert gadget is an software of the you best appearance once version 7 (YOLO V7) gadget that pursuits to discover and alert the presence of untamed animals in a precise region using superior pc vision techniques. This machine is designed to provide an effective and green method to discover the presence of wild animals and alert the authorities to take important precautions. The machine utilizes you best look as soon as version5 (YOLO V7) version, that's one of the maximum extensively used and famous deep learning fashions for object detection, to locate wild animals.The proposed gadget is ready with superior sensors and cameras which can be set up on drones or different surveillance devices, which seize real-time. images and transmit them to a significant processing unit for detection and evaluation.The YOLO V7 model is then used to item detection algorithm designed to hit upon wild animals and alert humans approximately their presence in real-time. This device uses a camera to seize live video feed from the encompassing environment and tactics it the use of the you handiest appearance as soon as version5 (YOLO V7) set of rules to discover the presence of wild animals. once an animal is detected, an alert is despatched to the person interface and a notification is sent to the user's mobile tool to warn them approximately the animal's presence. This device is specifically useful for folks that live in regions with high populations of untamed animals, such as national parks, flora and fauna reserves, or rural regions, as it could offer an early warning system to prevent dangerous encounters with wild animals.

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II. LITERATURE SURVEY

Sr. No.	Name of Paper	Publisher	Authors	Year	Description	Algorithm Used
1	Creating Alert Messages Based on Wild Animal Activity Detection Using Hybrid Deep Neural Networks	IEEE Access	B. NATARAJAN , R. ELAKKIYA	2023	To track the movement of wild animals, surveillance cameras and drones are often employed. However, an efficient model is required to detect the animal type, monitor its locomotion and provide its location information. Alert messages can then be sent to ensure the safety of people and foresters	LSTM
2	An Accurate and Fast Animal Species Detection System for Embedded Devices	IEEE Access	MAI IBRAHEAM , KIN FUN L	2023	Animal species detection methods based on regular Convolutional Neural Networks (CNNs) have been widely applied	YOLO v2
3	Convolutional Network based Animal Recognition using YOLO and Darknet	International Conference on Inventive Computation Technologie	B. Karthikeya Reddy;	2021	The manual detection of animals with their names is a very tedious task. To overcome this challenge, this research work has developed a YOLOV3 model to identify the animal present in the image given by user.	Yolov3
4	Detection and Recognition of Animals Using RCNN Algorithm	IEEE Access	Swethaa Prabhu	2023	Animal recognition and tracking systems have the potential to provide accurate and cost-effective monitoring of animal populations and their behaviour in the wild, which can be crucial for conservation efforts and ecological research.	CNN
5	WildARe-RCNN: A lightweight and efficient wild animal recognition model	IEEE Conference	Vishwas jain	2023	The system would collect the micro-climatic as well as positional information of the animal and communicate it to a base station through flooding of data using peer-to-peer network.	RCNN
6	IOT Based animal tracking using GPS	IEEE Access	V. Sangeetha	2020	The goal of this project is to track the location of Animal in the zoo or national parks. This system would include a temperature sensor and PIR sensor. The temperature sensor senses the temperature of each animal and PIR sensor senses the	LSTM

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					human presence inside the animal boundaries or restricted areas.	
7	A Zigbee-Based Animal Health Monitoring System	IEEE conference	Anuj Kumar and Gerhard P. Hancke	2015	This paper state that variations in temperatureon animals health has harmful effect leading to diseases suchas foot and mouth disease, swine fever, bovine spongioformencephalopathy (mad cow disease), bovine rhinotracheitis,squamous cell carcinoma, warts, web tear, necrotic pododer-matitis, polioencephalomalacia, hypomagnesaemia, clostridia disease and hypoglycemi	Yolov 2

III. PROPOSED SYSTEM

This proposed system aims to develop an animal detection system for traffic monitoring using the YOLO V7 algorithm deployed on a Raspberry Pi. The system utilizes a pre-trained YOLO V7 model to detect animals in real-time video streams captured by a camera module or USB webcam connected to the Raspberry Pi. Through a series of steps including setting up the Raspberry Pi, installing dependencies, configuring YOLO V7, writing detection code, optimizing for the Raspberry Pi's limited computational resources, and testing in controlled and real-world environments, the project aims to create an efficient and accurate solution for detecting animals in traffic scenarios.

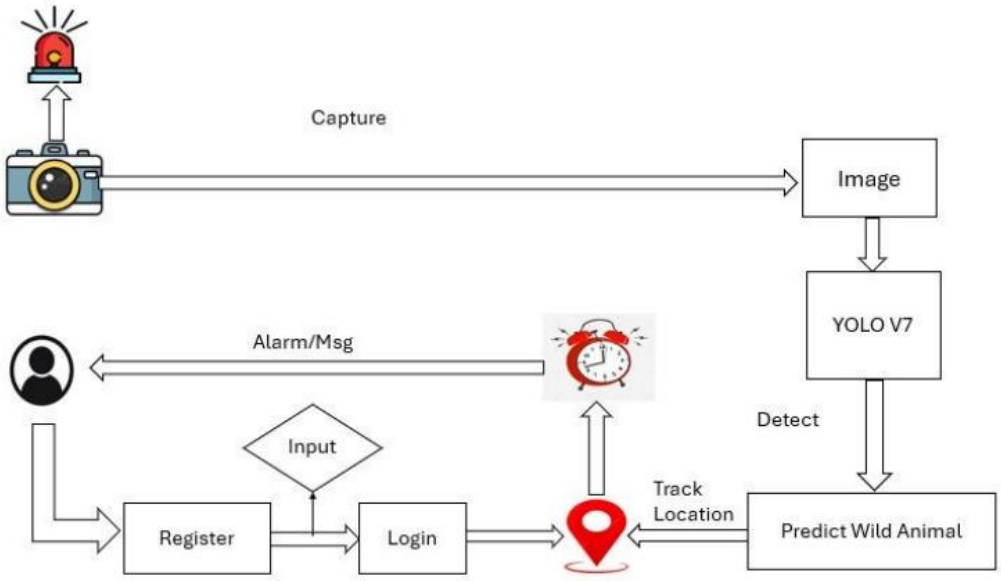

Fig 1. System Architecture

IV. SYSTEM REQUIREMENT

Software Requirement:

- **Technology:** Java,Python
- **Database:** MySQL5.5
- **IDE:** Spyder, Android Studio

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Hardware Requirement:

- **Processor:** Intel 5 Processor or more
- **RAM:** 4GB or more
- **Internal Storage:** 256GB or more
- **Operating System**: Android 7.0 or higher

V. SCOPE

Types of Wild Animals: This includes animals that may pose a threat to livestock (e.g., predators like wolves or coyotes), crops (e.g., deer or rabbits), or farm infrastructure (e.g., beavers or wild boars).

Signs of Threat: Farmers may receive alerts based on reports of tracks, sightings, or damage to property caused by wild animals.

VI. CONCLUSION

Identifying and classifying species is an essential first step in determining the long-term viability of animals and how our actions may affect them. It aids people in recognizing predators and non-predatory animals, both of which might pose a significant threat to local species and humans. This can potentially reduce the number of traffic accidents in various regions since some animals are regularly spotted on roadways, resulting in several collisions with automobiles

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