

### **AI BASED FRIGHTNER**

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#### **ABSTRACT**

Crop damage caused by animal attacks is one of the major threats in reducing the crop yield. Crops in farms are many times ravaged by local animals like buffalos, cows, goats, birds etc. This leads to huge losses for the farmers. It is not possible for farmers to barricade entire fields or stay on field 24 hours and guard it. The existing systems mainly provide the surveillance functionality. They also need to take actions based on the type of animal that tries to enter the area, as different animals from entering such restricted areas. The other commonly used methods by the farmers in order to prevent the crop vandalization by animals include building physical barriers, use of electric fences and manual surveillance and various such exhaustive and dangerous methods. Also the farmers resort to the other methods by erecting human puppets and effigies in their farms, which is ineffective in warding off the wild animals, though is useful to some extent to ward off birds. So here we propose an AI BASED FRIGHTNER that protects the crops from wild animals with the help of scanning using camera, it detects the stray animals or birds and when it detects the stray animals or birds then it produces a sound of animal extermination. We make a program with the help of live video detecting object using yolov3, coco names, cv2 modules. This ensures complete safety of crops from animals causing damage to it.

#### **1. INTRODUCTION**

In agriculture one of the major social Problems that is existing in the present is the damaging of the crops by the wild animals. Some of the animals in South India that act as a threat to crops are deer, monkey, elephant and others. This problem must be attended immediately and an effective solution must be created and accomplished. Thus, this project aims to address this problem. Animal attacks in India are a common story nowadays. Due to the unavailability of any detection system these attacks destroy their crops. Due to lack of proper safety measures, these villagers are left helpless to their fate. Also the crops of villagers are destroyed due to frequent

interference of animals. The crops and paddy fields cannot be always fenced. So the possibility of crops being eaten away by cows and goats are very much present. This could result in huge wastage of crops produced by the farmers.

Animals such as deer, wild boars, rabbits, moles, elephants, monkeys, and many others may cause serious damage to crops. They can damage the plants by feeding on plant parts or simply by running over the field and trampling over the crops. In India, problems associated with locally overabundant wildlife species have emerged as important management issues for reason of some species losing their natural habitat and adapting themselves to the man-altered



situation. Cropraiding by locally overabundant populations of nilgai antelopes has been widely reported in many parts of the country. Due to prolonged breeding activity and lacks of potential predators, numbers of nilgai have increased considerably and become locally overabundant in the states of Gujarat, Uttar Pradesh, Haryana, Punjab, Rajasthan, Madhya Pradesh and Delhi. The extent of Humaila conflict varied from place to place within these states. Nilgai were found to be capable of causing extensive damage to most agricultural crops. Damage to wheat, gram (*Cicer arietinum*) and mustard (*Brassica campestris*) crops was caused not only by foraging but also through trampling, resting in field and daily movement of the animals. In low density nilgai areas, losses to wheat, gram and moong (*Phaseolus mungo*) crops were 20-30%, 40-55% and 40-45%, respectively. Damage to guar and 2 cotton (*Gossypium arboretum*) was 20-35% and 25-40%, respectively. Our goal is to build a crop protection from animals using Artificial Intelligence. Cameras: Cameras can be used to take pictures or videos of animals. The images or videos can then be analyzed by a computer to identify the animals present. Sensors: Sensors can be used to detect the presence of animals by detecting their movement, heat signature, or sound.

**Radio collars:** Radio collars can be used to track the movement of animals. The collars emit a signal that can be tracked by a receiver. The specific technology that is used for animal detection will depend on the specific application. For example, cameras may be used to detect animals in a forest,

while sensors may be used to detect animals in a field.

**Sending an alert:** The system can send an alert to a human operator, who can then take action to deter the animal or protect people or property.

**Activating a deterrent:** The system can activate a deterrent, such as a siren or strobe light, to scare the animal away.

**Collecting data:** The system can collect data about the animal, such as its species, location, and time of day. This data can be used to track animal populations and movements. Animal detection systems are a valuable tool for protecting people and property from animals. They can also be used to study animal behavior and populations. Here are some examples of how animal detection systems are used:

**Wildlife conservation:** Animal detection systems can be used to track the movement of endangered animals and to identify areas where they are at risk of poaching.

**Agriculture:** Animal detection systems can be used to protect crops from animals, such as deer and wild boar.

**Security:** Animal detection systems can be used to detect animals that may be a threat to people or property, such as bears or coyotes.

## 2. LITERATURE SURVEY

The purpose of animal detection is to prevent or reduce the number of animal vehicle collisions. These systems are specifically aimed at the wild animals that can cause human death, injury and property damage. This system detects the wild animals before they enter the road. Historically animal-vehicle collisions have been addressed by putting up signs that warn peoples of potential animal crossings. In

other cases, wildlife warning reflectors or wildlife fences have been installed to keep animals away from the road. In some selected areas wildlife fencing has been combined with a series of wildlife crossing structures. Machine Learning-Machine learning enables computers to solve tasks without being explicitly programmed to solve them. State-of-the-art methods teach machines via supervised learning (i.e., by showing them correct pairs of inputs and outputs. For example, when classifying images, the machine is trained with many pairs of images and their corresponding labels, where the image is the input and its correct label (e.g., “buffalo”) is the output. Deep Learning Approach-As the above problem stated is still prevailing despite of all the methods taken, we approached the problem using deep learning to drive away the animals automatically. In our project, we used packages like Kera’s and Play sound to do the pre-processing steps involved and to create. Here, the input is received from the CCTV (Closed Circuit Television), the code does the processing and prediction of the frames received from the camera and appropriate repellent sound is played to drive away the detected animal. Object Detection-When we look at images or videos, we can easily locate and identify the objects of our interest within moments. Passing on of this intelligence to computers is nothing but object detection locating the object and identifying it. Object Detection has found its application in a wide variety of domains such as video surveillance, image retrieval systems, autonomous driving vehicles and many more. Various algorithms

can be used for object detection but we will be focusing on YoloV3 algorithm.

**3. SYSTEM DESIGN**

**3.1 SYSTEM ARCHITECTURE**

A system architecture is the conceptual model that defines the structure,behaviour more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behavior of the system.

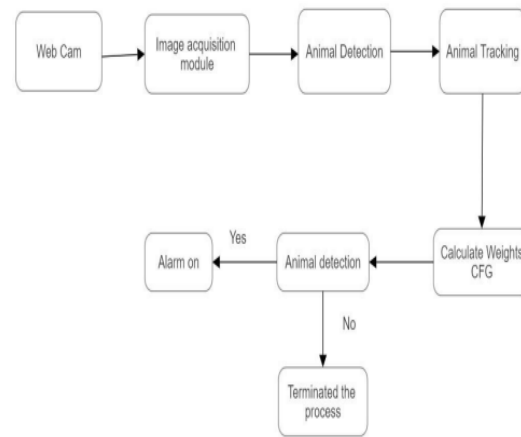


Fig-1 System Architecture

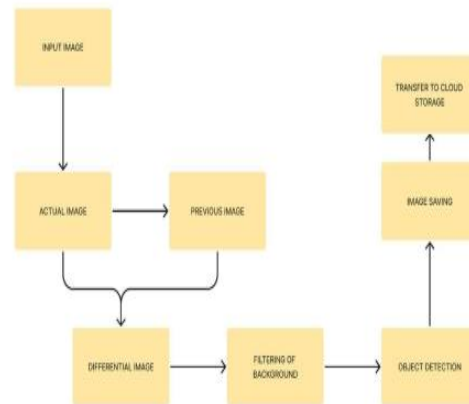


Fig-2 Flow Chart -2 of Animal Detection

Animal detection systems are used in a variety of applications, including wildlife conservation, agriculture, and security. They can be used to detect the presence of animals in a variety of environments, including forests, fields, and urban areas. There are a

number of different technologies that can be used for animal detection, including:

- **Cameras:** Cameras can be used to take pictures or videos of animals. The images videos can then be analyzed by a computer to identify the animals present.
- **Sensors:** Sensors can be used to detect the presence of animals by detecting their movement, heat signature, or sound.
- **Radio collars:** Radio collars can be used to track the movement of animals. The collars emit a signal that can be tracked by a receiver.
- The specific technology that is used for animal detection will depend on the specific application. For example, cameras may be used to detect animals in a forest, while sensors may be used to detect animals in a field.

### 3.2 ACTIVITY DIAGRAM

We use Activity Diagrams to illustrate the flow of control in a system and refer to the steps involved in the execution of a use case. We model sequential and concurrent activities using activity diagrams. So, we basically depict workflows visually using an activity diagram. An activity diagram focuses on condition of flow and the sequence in which it happens. We describe or depict what causes a particular event using an activity diagram. UML models basically three types of 16 diagrams, namely, structure diagrams, interaction diagrams, and behavior diagrams. An activity diagram is a behavioral diagram i.e. it depicts the behavior of a system. An activity diagram portrays the control flow from a start point to a finish point showing the various decision paths that exist while the activity is being executed. We can depict

both sequential processing and concurrent processing of activities using an activity diagram. They are used in business and process modelling where their primary use is to depict the dynamic aspects of a system. An activity diagram is very similar to a flowchart. So let us understand if an activity diagrams or a flowcharts are any different.

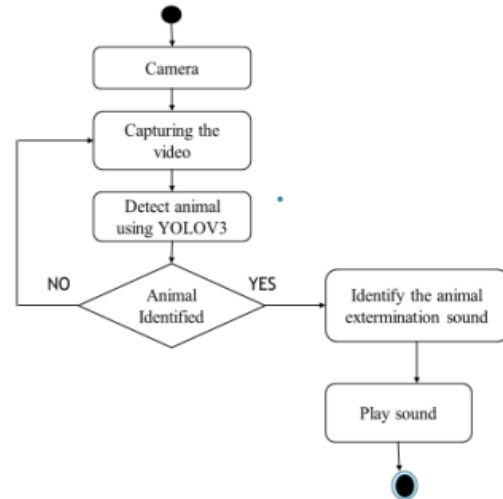


Fig-3 Activity Diagram

## 4. OUTPUT SCREENS

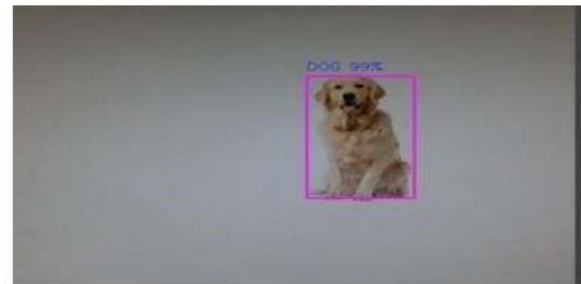


Fig-4 Detection of Dog by Camera

A smart crop protection system utilizes camera-based dog detection to safeguard crops. Using advanced technology, such as PIR and ultrasonic sensors, the system detects animal movement and triggers an alarm, diverting animals away from the crop fields.



Fig-5 Detection of Elephant by Camera

A smart crop protection system utilizes camera-based Elephant detection to safeguard crops. Using advanced technology, such as PIR and ultrasonic sensors, the system detects animal movement and triggers an alarm, diverting animals away from the crop fields

### PLAYING EXTERMINATION SOUND

When the animal comes into the field it can be detected which animal it is and the extermination is played to scare the animal. When the sound started the animal scared and get out the field.

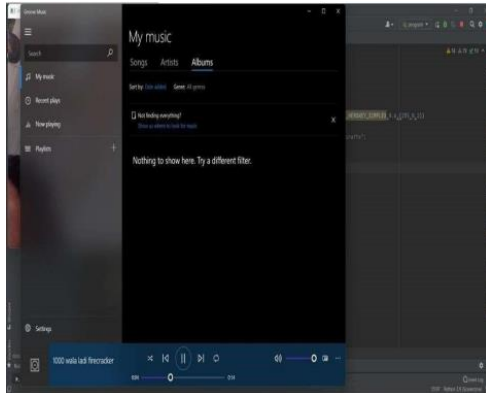


Fig- 6 -Playing Extermination sound

## 5. CONCLUSION

Ai Based Frightener is a system that repels the wild animals that are trying to enter the field and exterminates them by playing the sound that they fear off. So, it can be concluded that we can recognize and reverse the animals before they enter the field by playing various repelling sounds. The problem of crop vandalization by wild animals has become a major social problem

in current time. In other words, while utilizing his crop production, every farmer should be aware and take into consideration the fact that animals are living beings and need to be protected from any potential suffering. It requires urgent attention and an effective solution. By doing so, we reduce the crop loss and man power. This project is very useful and affordable to the farmer. The module will not be dangerous to animal and human being, and it protects farm. Thus, this project carries a great social relevance as it will help farmers in protecting their fields and save them from significant financial losses and will save them from the unproductive efforts that they endure for the protection of their fields. This ensures complete safety of crops from animals causing damage to it.

## 6. FUTURE ENHANCEMENT

We are using an integrative approach in the field of Artificial Intelligence to overcome this. The goal of this work is to provide a repelling and monitoring system for crop protection against animal attacks. In our future work, we will extend the current functionalities of a model like increasing the dataset so as to achieve high accuracy and investigate the chance of incorporating the future of the model to other sectors. It can be made into a robot and do the needful actions like moving hands and make it scare animals. It can be made to detect Human intrusion in order to stop robbery of crops.

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