International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

AI BASED SCARECROW

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ABSTRACT

Crop damage are caused by animal attacks is one of the major threat s in reducing the crop field. This leads to huge losses for the formers. It is not possible for formers to barricade entire fields or stay on field 24 hours and guard it. The other commonly used methods by the formers in order to prevent the crop vandalization by animals including building physical barriers, use of electrical fences and manual surveillance and various such exhaustive and dangerous methods. So here we propose “Ai Based Scarecrow” that protects the crop from wild animals with the help of scanning and using the camera. It detects the stary animals and birds enter into the crop field. When it detects the stary animals and birds then its produce a sound of animal extermination.

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 m 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.

The foraging activities of cropland bird species like House Crow have caused more damage to wheat, while pigeons and doves cause damage to pearl millet and sunflower. Also, the parakeets and crows were found to inflict more damage to the crops than what they actually consumed. In India, problems associated with locally overabundant wildlife species have emerged as wild life species have emerged as important management issues for reason of some species losing their natural habitat and adapting themselves to the man-altered situation. Crop-raiding by locally overabundant populations of nilgai antelopes (Boselaphus tragocamelus) 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 human- nilgai 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 (Triticum aestivum), 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 (Cyamopsis tetragonoloba) and cotton (Gossypium arboretum) was 20-35% and 25-40%, respectively.

The existing systems mainly provide the surveillance functionality. Also, these systems don't provide protection from wild animals, especially in such an application area. 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, IOT based Sensor monitoring and manual surveillance and various such exhaustive and dangerous methods.

Our goal is to build a crop protection from animals using Artificial Intelligence. This system is called “AI Based Scarecrow”. This system detects the animals entering into the crop field and plays an extermination sound that is most feared by the animal. We are using YoloV3 Algorithm that is a Real time live object detection algorithm that detects the animals in the live video. cv2 module is

used to capture video. Play sound module is used to play extermination sound. We are using coco names data set for identifying animals and their names if detected by YoloV3 Algorithm. Its accuracy is more compared to existing systems**.**

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:

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

2.1EXISTING SYSTEM

Manual way such as constructing different kinds of fences and using natural repellents

are effective but they are not cost efficient. It is also not possible to increase the man power. So, initial projects were taken up to drive away the animals automatically by using hardware components like controllers and sensors. One such approaches camera interfaced to the Raspberry pi module. Camera is used to capture an image of wild animal and send captured image to the Raspberry pi module. When image can take by the Raspberry pi and compared with database image. After comparing, if the wild animal is detected then it gives commands to GSM module. GSM used to send message to the owner of the farm. The problem here is there is more of hardware components which is not cost efficient and its maintenance is also hard. Another approach is based on Arduino Uno based system using microcontroller. This system uses a motion sensor to detect wild animals approaching near the field. In such a case the sensor signals the microcontroller to take action. The microcontroller now sounds an alarm to drive away animals from the field as well as SMS send to the farmer so that the farmer may know about the issue. In recent times, researches are taken to solve this problem using Artificial Intelligence.

DISADVANTAGES:

- Electric fences are dangerous to animals and humans.
- IOT based sensors monitoring doesn't provide accurate results.

MOTIVATION:

The motivation for building an AI-based scarecrow would be to create a more efficient

and effective means of protecting crops from birds and other animals that may damage or destroy them. Traditional scarecrows, while they can be effective to some degree, are often static and can easily be ignored by birds and other animals after they become accustomed to them. By incorporating AI technology, a scarecrow could be designed to move and make noise in a more natural and unpredictable way, which could be more effective in deterring birds and other animals from approaching the crops. Additionally, an AI-based scarecrow could potentially have

the ability to learn and adapt its behavior based on feedback from sensors or cameras in the field, making it more effective over time. Overall, an AI-based scarecrow has the potential to be a more efficient and effective means of protecting crops from damage, potentially reducing the need for harmful pesticides and ultimately increasing crop yields.

2.2 PROPOSED SYSTEM

Our goal is to build a crop protection from animals using Artificial Intelligence.

This system is called "AI Based Scarecrow". This system detects the animals entering into the crop field and plays an extermination sound that is most feared by the animal. We are using YoloV3 Algorithm that is a Real time live object detection algorithm that detects the animals in the live video. cv2 module is used to capture video. Playsound module is used to play extermination sound. We are using coco.names data set for identifying animals and their names if detected by YoloV3 Algorithm. Its accuracy is more compared to existing systems.

YOLOV3 ALGORITHM: YOLOv3 (You Only Look Once, Version 3) is a real-time object detection algorithm that identifies specific objects in videos, live feeds, or images. YOLO uses features learned by Deep Convolutional Neural network to detect an object. Versions 1-3 of YOLO were created by Joseph Redmon and Ali Farhadi.(1)

The first version of YOLO was created in 2016, and version 3, which is discussed extensively in this article, was made two years later in 2018. YOLOv3 is an improved version of

YOLO and YOLOv2. YOLO is implemented using the Keras or OpenCV deep learning libraries.

COCO.NAMES DATASET:

COCO dataset, meaning "Common Objects In Context", is a set of challenging, high quality datasets for computer vision, mostly state-of-the-art neural networks. This name is also used to name a format used by those datasets.(2)

ADVANTAGES:

- Well aimed and precise.
- No need of human attention.
- Cause no harm to animals and human.

MODULES:

IMAGE DETECTION:

- Image detection is the process of identifying the animals from images or video frame.

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ISSN: 2457-0362

- In Image detection process a web cam is used to capture image of animals.
- The Image is captured from the video frames using OpenCV. • Once the animal is detected it stores the image of animal.

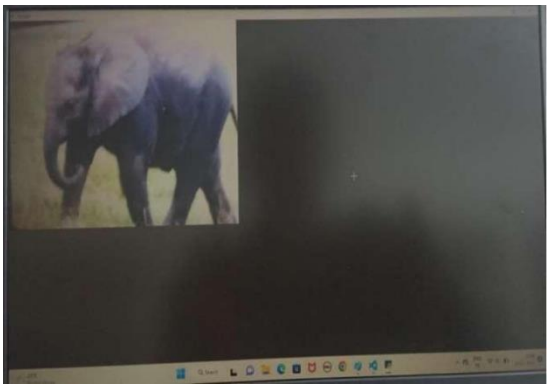
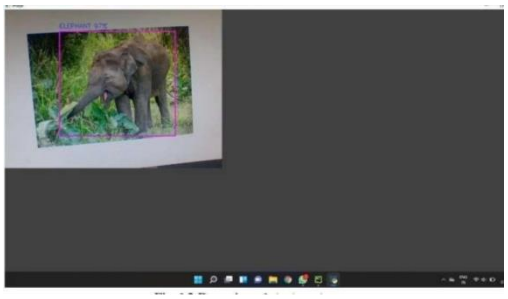


Fig Capturing the animal image.

CERTAINTY MODULE:

- In certainty module we came to know about the accuracy of image predicted.
- The Image is displayed with the name and a bounded box around the image base on the coco.names dataset.
- If the accuracy of the image is more than 90% the image will be selected.

• Based on selected image the extermination sound is played using play sound module.

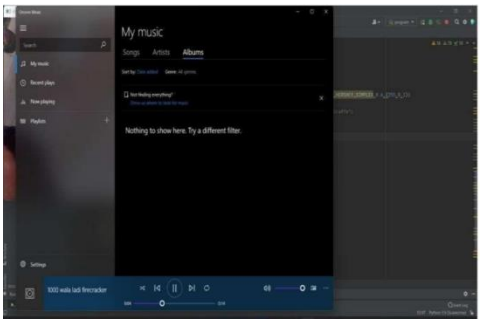


Detection Of Animal

PLAY SOUND MODULE:

- Play sound module is use to play the animal extermination sounds.
- When the animal is detected by yolov3 then it sends animal name to play sound module.
- According to the animal detected the animal extermination sound is played.

• When animal hear to the sound ,then it run away from the field.



Playing animal extermination sound.

3.SYSTEM DESIGN

3.1 SYSTEM ARCHITECTURE:

A system architecture is the conceptual model that defines the structure ,behaviour

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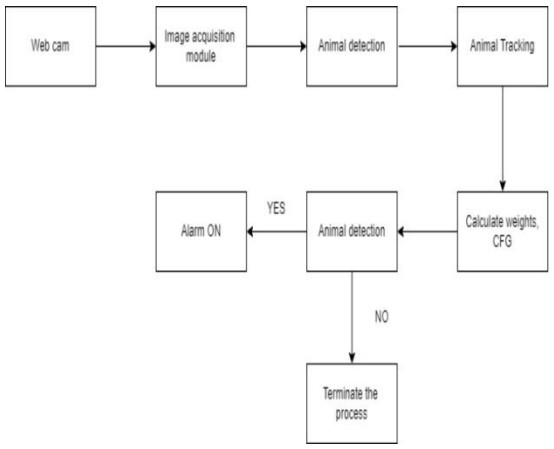
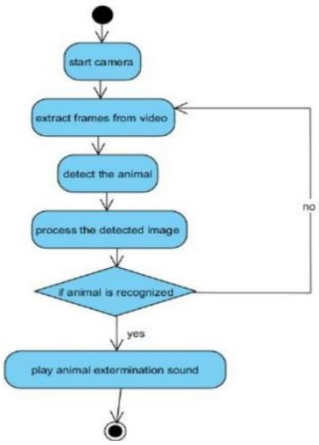
and more views of a system An architecture description is a formal description and representation system, organized in a way that supports reasoning about the structures and behaviors of the system**.**



ACTIVITY DIAGRAM:

Activity diagrams are graphical representations of Workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modelling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control. Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram is the message part. The purpose of an activity diagram can be described as –Draw the activity flow of a system. Describe the sequence from one activity to another.



4.OUTPUT SCREENS

ANIMAL DETECTION

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ISSN: 2457-0362

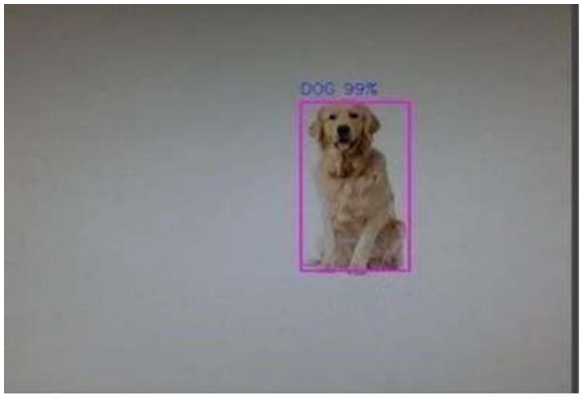
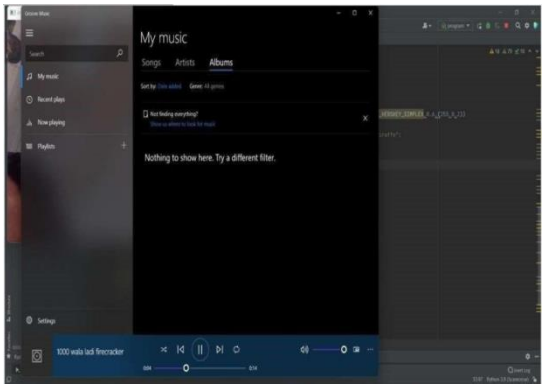


Fig-9 Detection of Dog by Camera

BIRDS DETECTION

PLAYING EXTERMINATION SOUND:



5. CONCLUSION

AI Based Scarecrow 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/her 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.

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6. FUTURE ENHANCEMENT

We our 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.

7.REFERENCES

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