Forest Animal Detection System Using Machine Learning

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ABSTRACT
In forest areas and agricultural areas human and animal conflict is a big problem where there is a number of resources is lost. Due to this People lose their products, income, and sometimes their food. So, this is to be monitored continuously to prevent entry of animals. With keen on this problem, we have made a model to develop the system which will monitor the field without any harm. At first it will detect intrusion around the field using sensor, then camera will capture the image of the intruder and classify them using image processing and then taking suitable action based on the type of the intruder. Finally sends notification to particular person and forest officials using Telegram application. In India nearly 65% of the people are directly or indirectly dependent on agricultural sector for economic survival. The annual income of farmers is significantly influenced by the yield of the crops, which is continuously decreasing due to natural phenomena and poor technological advancement. Many of the used methods result in extinction of the rare species. Therefore, there is a need to develop alternative techniques, such that it does not harm birds and animals where it protects the crops, thus we have collected sources from the experts in the fields of ornithology, agricultural sectors, and field visits, to avoid irreversible harm to the Indian biodiversity. This research analyzes the loss of yield of crops due to birds and animals, explores repelling techniques adopted by the farmers, and addresses the consequences of damage caused by the bird and animals to field crops in India. This project protects farmers from reduced crop damage.

Keywords: Forest Zone, Agriculture field, Animal Detection, Image Processing, Live capture, Alert through Telegram

I. INTRODUCTION
India is an agricultural country. Agriculture has always been The India's most important economical sector. Though most of the India's population depends on agriculture, there are a lot of problems have been faced by farmers. Human animal malinterruption is a big problem where large number of resources is lost and our farm is in danger. In recent times these kind of problem is increasing rapidly. So, the area is to be protected safely to prevent entry of any kind of animals and at the same time it should not be any harm to anyone. Human and animal interruptions arise due to forest disasters, humans shifting into the forest to satisfy their livelihood, for claiming of land for agricultural purposes and industrialization causes spreading of urban ground and animals enter the nearby villages to satisfy their needs which has been demolished. Elephants or wild boar ramp the cultivation in farm land in need of food. Need of the animal or human puts the other in real danger, in this process, resources are wasted and sometimes we can’t guarantee our life too. Human and elephant conflict is more in south Asia and in Africa. Usually, farms are protected with an electrical fence, animal which tries to enter the field suffers electrocution with intense pain cause animals to behave in abnormal manner.

II. EASEOF USE
Wildlife monitoring is crucial for tracking animal habitat utilization, population demographics, poaching incidents, and movement patterns. Numerous technologies have been introduced that includes motion-sensitive camera traps, radio tracking, wireless sensor network tracking, and satellite for monitoring wild animals. Currently, the animalespialandrecognitionarestillanarduouschallengeandthere is no unique method that provides a sturdy and
Efficient solution at all situations. Monitoring wild animals through cameratraps are prominent due to their commercial availability, equipped features, and ease deployment. The extraction of knowledge from these camera capturing images is implemented using machine learning and deep learning models. Machine learning (ML) plays a key role in a wide range of statistical, image recognition, natural language processing, and expert systems.

B. Proposed System

In this we are using deep convolutional neural network method to detect the animals and birds in live capture. In the first process of detection in live capture animal and birds, we are used to pre-train the structure of the animals in different angles, for every animals we need to pre-train the images of different angles.

In our project, the live images are captured and matched with pre-trained images and gives sound through speaker and to repelled the animals in night time the flashlights are used, when the alert are given a sound the message is sent to farmer via telegram.

III. IMPLEMENTATION

We used Python 3.7 Platform and Anaconda Tool (Spyder). The first step is to install Anaconda Tool.

A. Step by step process:

- First detect the interruption around the field.
- To capture the image how the interruption happens and
- Categorize them using image processing.
- Taking fitting measures based on the type of the interruption.
- To send notification to farm owner and
- Forest officials using Telegram.

B. Architecture

![Architecture of the system](image)

C. Results

Thus this project uses Convolutional Neural Network (CNN) algorithm to detect wild animals. The algorithm classifies animals efficiently with a good number of accuracy and also the image of the detected animal is displayed for a better result so that it can be used for other purposes such as detecting wild animals entering into human habitat and to prevent wildlife.
IV. CONCLUSION

In this paper, the well-known algorithms of machine learning such as SVM, Random Forest and deep learning models including Alexnet, InceptionV3 are compared for classification of wild animals species from KTH dataset. Among which deep learning model, InceptionV3 outperforms thanother models and achieves better accuracy. The experiment uses KTH dataset that composed of 19 different categories of animal samples among which 12 classes are selected to measure the performance of the models. From the experiment, random forest produces better results compared to SVM. Among deep learning models, InceptionV3 conferred excellent result. However, machine learning algorithm provides good accuracy for the small dataset rather than the large dataset.

V. FUTURE SCOPE

The system can be further extended by sending the image and alert in the form of a message when the interruption is detected to the nearby centres. Furthermore, it can be used to reduce human wildlife conflict and also some accidents. We can produce corresponding warning alerts for animals to go out from agriculture lands.

REFERENCES


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