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RESEARCH ARTICLE

Automated Face Authentication and Alert System Using AI

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ABSTRACT

Local animals such as buffaloes, elephants, goats, birds, and others frequently kill farm crops. Farmers lose a lot of money as a result. Farmers cannot barricade whole fields or remain on the premises 24 hours a day to guard them. For animal detection and unknown individual detection, we propose a deep learning process. We will create a system to detect wild animals trespassing on agricultural fields as part of this project. We'll be working on a device to identify wild animals trespassing on farmland as part of this project. Animal detection and classification may help farmers avoid damage to their fields, track down livestock, and avoid crop loss. To recognize unknown persons or animal, we'll use face recognition tools.

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Introduction

A mobile application is developed using react native. When an unknown person or an animal enters into an agricultural land an alert is sent to the mobile application with a live streaming. Hence this project helps in protecting the agricultural land from being destroyed by animals as well as unknown person.

Agricultural lands are very closes to protected areas (PAs) which is often faced a lot of effect due over grase by the herbivores animals, which is severe problem for the farmers who is mainly depends on the agriculture produce. In order to overcame this problem and avoid economic loss, farmers have to apply some of the protective measures. which include and using the dogs at the fields it's very difficult to stay in field all the time, various types of fences, trenches and other sound making devices. However, these type measure may be expensive and little bit risky. The different types of fences we are using are wooden fence and

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some of the throney fences which which makes the substantial damage to the forest. Animals can be killed or injured as a result of interventions such as traps. Electric fences, for example, are costly to build and maintain. Despite the fact that while a number of approaches have been developed and demonstrated to be effective on a small scale, there are reasons why they have had limited success when implemented on a larger scale.

Wildlife-related economic loss presents a major challenge to animal conservation, as citizens' anger increases, possibly leading to retribution. Sufficient remuneration is thought to mitigate tension, thus increasing the efficacy of conservation efforts. Compensation has been shown to be a successful management policy for wolves in Yellowstone National Park, at least in one situation. Even if no compensation is assumed to aid conservation, the government will recognize it as its social justice obligation to compensate farmers for their losses. Many countries, including our study region, have laws that enable farmers to be compensated for their losses. Despite the fact that a number of studies on crop raiding have been published, few of them use robust methods for primary damage assessment and make an effort to verify or cross-check the methods Some rigorous methods for damage assessment in the context of rodent injury have been proposed, but none of these methods have been used in compensation procedures in the study area. Since our study area's legal procedures for assessing the degree of harm lack precise guidelines, a visual inspection and estimation of damage is performed, along with negotiations between the farmer and the compensating authority. As a result, farmers and park officials have been at odds for some time.

Different herbivores cause different patterns of damage, making it difficult to estimate them using a single tool. Raids by Asian elephants can cause visible damage over a measurable area, while smaller to medium sized herbivores such as blackbucks, nilgais, sheeps, wild pigs, and others are unable to identify the damage easily.

Literature Review

Despite the fact that every algorithm for animal detection using a computer vision device has improved over time, it is still virtually unusable in an uncontrolled setting. Object identification, recognition, and classification, among other things, have piqued people's interest. Visual scene tracking for animals is one of the most active research subjects in computer vision right now (CV). Despite the fact that there has been a lot of study, intelligent, real-time methods for dynamic object detection and recognition remain inaccessible. The Deep Convolutional Neural Network (CNN) is proposed in this paper for detecting and classifying animals (vertebrate classes) in digital images. In This CNN is used to train the dataset. Just five species have been found so far.

To close this gap, we'll use AL and a new criterion called Transfer Sampling (TS). TS employs Optimal Transport (OT) to locate corresponding regions in the space of CNN activations between the source and target data sets. The samples are ranked according to their probability of being animals using the CNN scores from the source data set, and this rating is then transferred to the target data set. Unlike traditional AL parameters, which take advantage of model ambiguity, TS focuses on very confident samples, allowing for fast retrieval of true positives in the target data set, where true positives are usually uncommon and difficult to identify by visual inspection. In difficult sets of UAV pictures, nearly 80% of the animals are found. The system is very poor in accuracy.

A system for counting objects in general that does not require any prior knowledge of the object's type. Without using any form of local annotations, we learn from local image divisions to predict global image-level counts. Our method divides the input image into several image divisions, each of which covers the entire image. A collection of area proposals or standardised grid cells make up each image division. To predict global image-level counts from local image divisions, our method employs an end-to-end deep learning architecture. When dealing with overlapping image regions, the approach includes a counting layer that predicts object counts across the entire image by enforcing consistency in counts. An typical acoustic sound with a resonant frequency of 15 kHz and a sound pressure level of 55 dB at a distance of 1 m. The system is very poor in accuracy.

Interfering with wildlife in their natural environment without permission is considered to be dangerous to both humans and animals. Forest fire is a significant threat that happens on a regular basis as a result of natural events or human activities. The aim is to develop a framework based on IoT and wireless networks that can be updated from the cloud. Until entering human range, wild animals' motion is recorded using sensors and alerted through cloud periodic notification. To detect forest fires, To achieve high verdict accuracy for early detection with minimal consequences, a network-based wireless sensor is used. People in the area have been notified and told by an alarm system that has been mounted. The comparisons of results across a complex range of demanding camera-trap data show. The system is very poor in accuracy.

Disadvantages in Existing System

- Very low accuracy.
- Only few types of animals are been detected.
- No real time implementation using camera.

Methodology

We'll be working on a device to identify wild animals trespassing on farmland as part of this project. Animal detection and classification may help farmers avoid damage to their fields, track down livestock, and avoid crop loss. We will be using face recognition technique to identify unknown person to prevent trespassing. A mobile application is developed using react native.

When an unknown person or an animal enters into an agricultural land an alert is sent to the mobile application with a live streaming.

Hence this project helps in protecting the agricultural land from being destroyed by animals as well as unknown person.

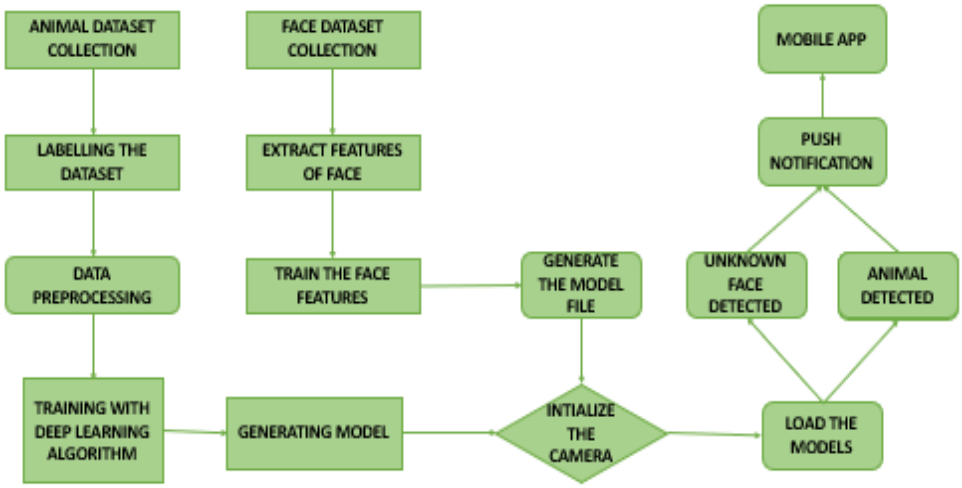

Figure 1. Architectural diagram

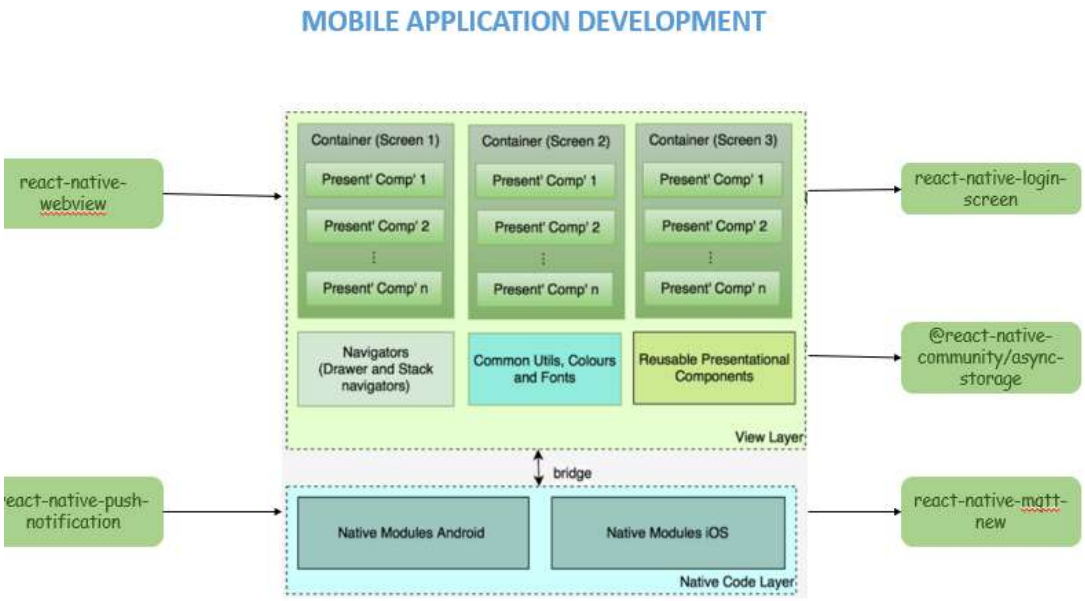

Figure 2. Mobile application development

Dataset Collection

The dataset collection module is responsible for gathering data that the machine can evaluate in order to conduct deep learning.

There are three steps of collecting data.

- Manually finding and uploading pictures takes a long time because of the amount of human activity needed to take picture and to upload.
- Because data has become such a valuable commodity in the deep learning period, a lot of it comes from third-party sources.
- We'll start with a network that has already been trained on a large dataset and fine-tune it ourselves.

Preprocessing

The trained data module is the project's preprocessing data module. In most instances, the data you will find in practice will not be safe. It means there would be non-uniform data types, missing values, outliers, and features with large ranges in the data.

The data would not be appropriate for use as model training data.

As a result, the data must be preprocessed in a variety of ways.

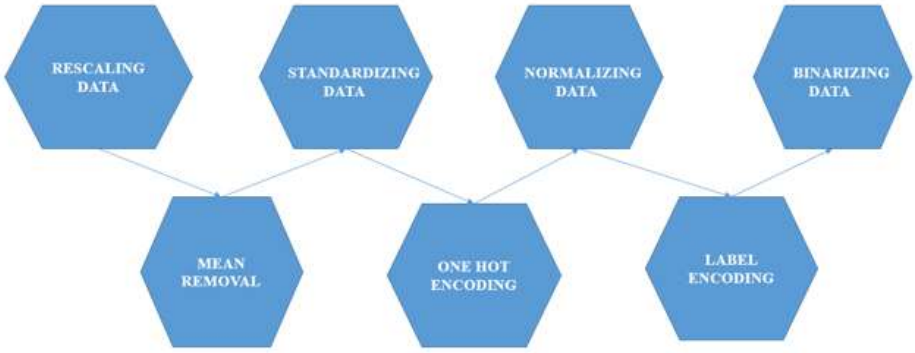

Figure 3. Preprocessing

Data Augmentation

Deep learning neural networks' performance is also improved by the amount of data available.Data augmentation is a method of producing new training data from old data. This is accomplished by using domain-specific techniques to generate new and unique training examples from the training data.

The most well-known method of data augmentation is image data augmentation, which involves transforming images in the training dataset into transformed versions that belong to the same class as the original image.

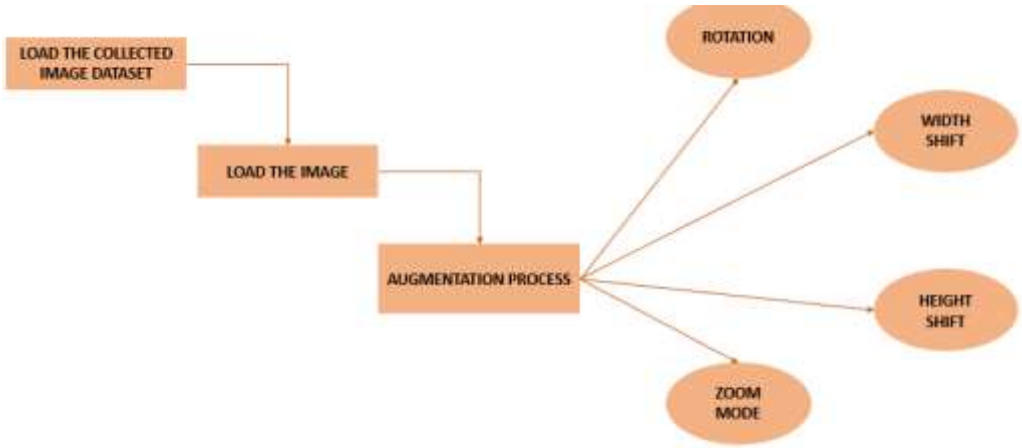

Figure 4. Data augumentaion

Training

In this we use googlenet algorithm to tarin the datasets. In order to predict the presence of animal we will be training with deeper googlenet which provides accuracy in classification of images.

Mobile Application Development

React native is used to build a mobile application. When an unknown human or animal enters agricultural property, a live streaming alert is sent to the smartphone application. As a result, this project assists in the defence of agricultural land from being ravaged by animals or unknown individual.

Result and Discussion

When the known person entedred into the farm it captures and stored with the name in the database as shown in Figure 5.

Figure 5. For known person

When the Unknown person entedred into the farm it captures and stored as unknows in the database as shown in Figure 6 and gives an alert message.

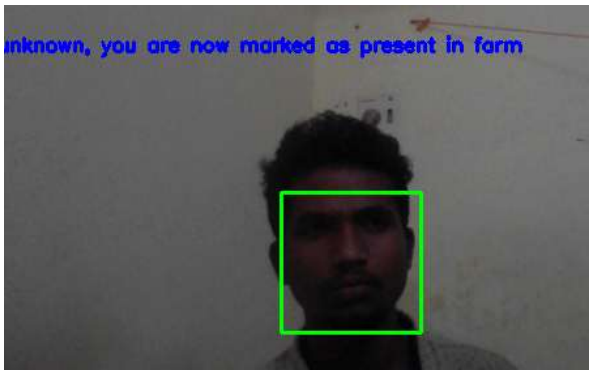

Figure 6. For unknown person

The GUI for this application is developed as an Android APP as shown in Figure 7 and the status of the farm is as shown in figure 8.

Figure 7. Login page

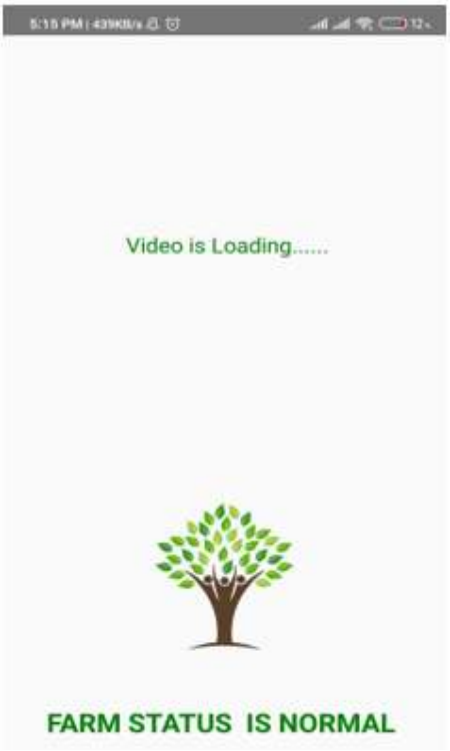

Figure 8. Farm status

When the animal is entered into the farm it gives an alarm as shown in the figure 9.

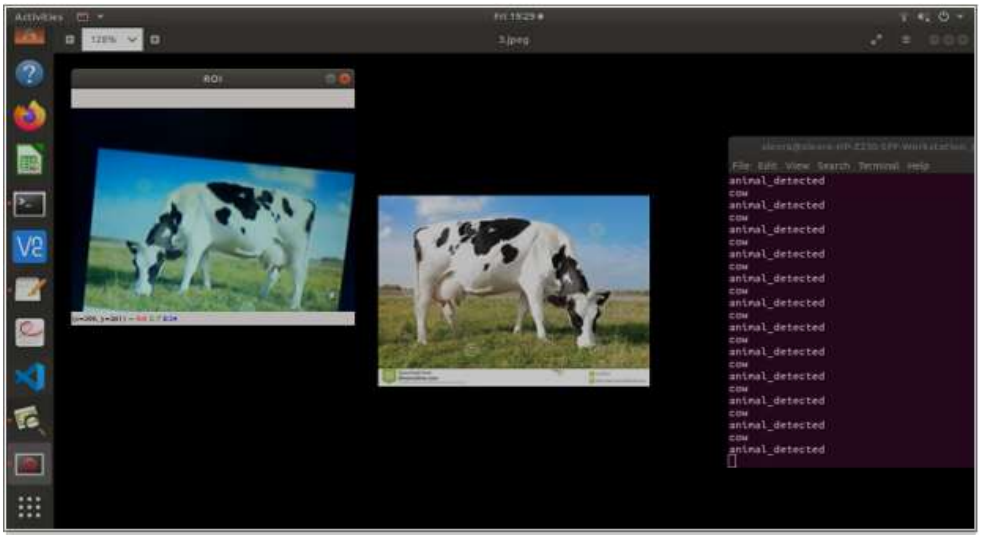

Figure 9. Animal Detection

Conclusion

This project is used to track animals or trespassers in agricultural fields. This also aids in the provision of effective defense at a low cost, thus reducing the losses sustained by farmers as a result of crop failure. It is currently performed manually, which takes longer and entails a higher rate of human error. As a result, this project decreases the amount of time needed for manual classification and removes the rate of human error. In the near future, animal detection technology can be used in agriculture to help identify trespassers and animals entering fields with high precision. There are more opportunities to build or convert this project in the field of agriculture in a variety of ways. As a result, this project has a promising future ahead of it, with manual forecasting being easily converted to computerized output at a low cost.

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