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Animal Detection in Farms

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A B S T R A C T

Over the last many ages, there has been a steady rise in number of reported mortal animal conflicts. While there are several reasons for increase in similar conflicts, foremost among them is the reduction in timber cover. A broad range

of methodologies in computer vision and deep- learning have shown enormous implicit to answer similar problems. The design of a prototype for the proposed result is also described, which uses Raspberry Pi devices equipped with cameras. The proposed methodology achieves an accurateness of98.8 and99.8 to discover animals and humans together.

Keywords: Animal, Reduction, Methodologies, Deep-learning.

1. Introduction

There have been adding reports of wild animals entering townlets or cities, especially in settlements circling forestland areas, risking mortal lives. Intrusions by animals cause huge losses be it in terms of crop loss or cattle being attacked. adding mortal population leading to dwindling forestland cover is one of the leading causes for rise in mortal animal conflicts. Use of deep learning methodologies to classify images that contain entities of interest are gaining popularity. Deep Convolutional Neural Networks (DCNN) are known to be accurate, and outperform all other being methods in the task of image classification.

2. Methodology

Here we use the convolutional neural network to build the model. Object detection relates to both machine learning and image processing which is used to detect the instances of the object. The algorithms for object detection are popularly used in real time applications. Here we collected different animals namely elephants, dears, bears, buffalos, etc. After gathered data, it is divided into two folders, testing data set and training data set. Fig 1. Shows the overall diagram of the methodology.

3. Software Description

The YOLO (You Only Look formerly) real-time object discovery algorithm, which is one of the most effective object finding algorithms that also encompasses numerous of the most innovative ideas coming out of the computer vision investigation community. Object finding is a critical capability of independent vehicle technology. It’s an area of computer vision that’s exploding and working so much better than just a many years ago.

4. Modelling and Analysis

Then we collected different animals namely elephants, deer, bears, buffalo, hens, etc. After gathered data, it's divided into two folders, testing data set and training data set. We divide all images (of size 800 × 600 pixels) into the same size. To get a high accurateness we use the data augmentation methodology. Using python and visual code IDE, we make the CNN model and divide the data set according to the 7030 rules. (70 for the training data set and 30 for the testing data set).

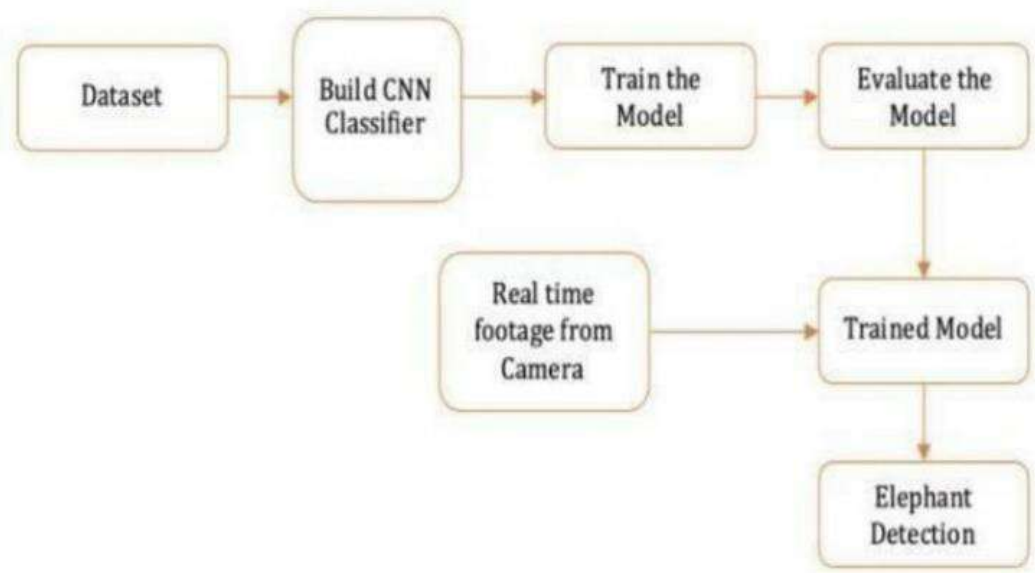

Fig. 1. Flow Diagram

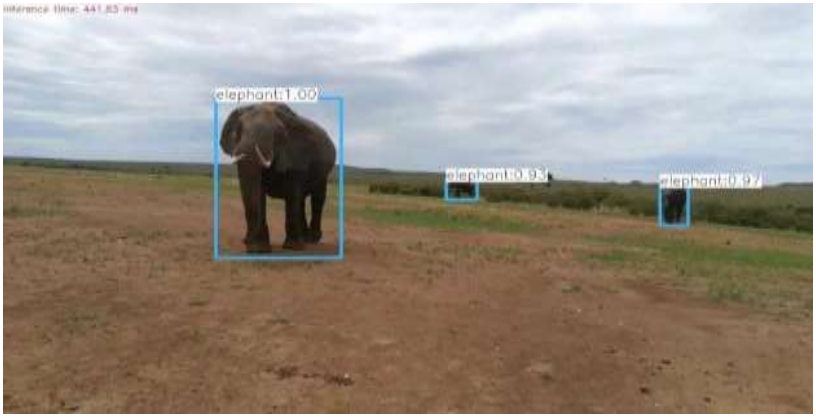

Fig. 2. Animal Detection

5. Result and Discussion

The results and performances of our system show that it provides an effective and robust procedure for wildlife spotting and analysis. The animal spotting has shown accurateness up to 91 with F1- measure up to0.95. We observe that our system is robust to pose as we've taken images of animals from different views for animal – background verification. also, the system works well in both day and night time as our database contains both classifications of images, i.e., day images and night time images. They claimed F-score 0.839, which is lower than our study i.e. 0.951. Similarly, in the researchers have applied graph cut for object classification and object verification for animal detection with F1-measure 0.8695, which is also lower than this work.

6. Conclusion

The proposed system attempts to reduce human-animal conflicts by continuous and automatic monitoring of vulnerable areas using computer vision to detect animal intrusions. The intrusion detection pipeline consists of three stages –animal detection, animal tracking and user alerts and notifications. Although the prototype described in this paper is trained to recognize five different species of animals, it is easily extendable to detect and track other types of animals with sufficient training data. The choice of species can also be region specific, thereby providing a unique edge over other existing solutions. Such a system if implemented on a large scale, has potential to largely reduce causalities due to animal intrusions.

7. Future Scope

This work can be further extended by sending an alert in the form of a message when the animal is detected to the nearby forest office. Furthermore it can be used to reduce human wildlife conflict and also animal accident.

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