International Journal of Innovative Research in Engineering
Volume 3, Issue 3 (May-June 2022), PP: 64-68.
www.theijire.com
ISSN No: 2582-8746

Animal Detection Using Machine Learning

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How to cite this paper:
A. Lalitha[1], S. Nivasraj[2], C. Praveen Kumar[3], Girish. M.V[4], "Animal Detection Using Machine Learning", IJIRE-V3I03-64-68.

Abstract: *Object Detection is a field of computer vision and image processing which kjkjinvolves detecting objects of varying class (animal, humans or cars) present in images and videos. Some well researched applications of object detection are in the domain of car detection, face detection, image retrieval and video surveillance. This survey especially focuses on to examine the different images and videos based object detection methods to support various environments. The main objective of this research is to study about different images and videos based object detection methods used for detecting and solving images and videos based object detection problems. This paper provides detailed information about the different object detection techniques in various environments. Finally, comparisons are made for different object detection methods used in different images and videos environments.*

I. INTRODUCTION

Over the last decade, we have seen an increase in the use of technology in many business sectors to simplify and better engage customers. This is especially true in the banking and finance sector. Since the start of the digital revolution facial recognition has been gaining prominence over touch and type based interactions due to the convenience it offers without compromising on the security of transactions. Despite an increase in the use of EMV cards (Europay, MasterCard, Visa) coupled with password creation policies, there has been a surge in banking fraud cases. As a result of the billions that are lost by major banking institutions, there has been a call to switch to biometric facial recognition to curb this issue. It means that banking software will rely on face scans which it then compares with similar ones that were uploaded by the bank's personnel into their system so as to verify the customer's identity. The aim is to authenticate the identity and only allow a transaction to go through if the account owner's identity is positively identified. This customer ID authentication process is known as KYC (Know Your Customer).

A. *Scope of the project:*

Many methods have been developed by human being in order to have a better understanding on animal behavior. Identifying animal attributes, analyzing their behavior in the pictures remains an expensive time consuming manual task performed by various researchers. Thus, we demonstrate that such detection of animal can be done by machine learning algorithm.

B. *Feature Extraction:*

Feature extraction is a process of dimensionality reduction by which an initial set of raw data is reduced to more manageable groups for processing. A characteristic of these large data sets is a large number of variables that require a lot of computing resources to process.

C. Aim and Objectives of the project:

Feature extraction is a process of dimensionality reduction by which an initial set of raw data is reduced to more manageable groups for processing. A characteristic of these large data sets is a large number of variables that require a lot of computing resources to process.

Pre-Processing

In detecting abnormalities associated with fundus image, the images have to be Pre-Processed in order to correct the problems of uneven illumination problem, insufficient contrast between exudates and image background pixels and presence of noise in the input fundus image.

II. RELATED WORKS

In existing system zoological systems for tracing an animal, identification, and anti-theft for the management and security of animal in zoo with the help of sensor, radio-frequency identification (RFID), and global positioning system (GPS). By tracking and observing the animal movements, it helps us to have a better understanding on how an animal behaves and interacts with its environment Sometimes sensors not sensed. Deciding to tag animals with RFID can be both a business decision as well as personal. Tagging livestock with RFID can be an important tool in a farmer's arsenal to identify each animal. An LF reader or wand scans the animal during veterinary visits or inventory counts, and with the help of software, uploads significant information on each animal to a database.

New equipment and software is available that builds on the LF RFID identification premise, but offer new data and options. These new livestock tracking RFID systems use UHF RFID and GPS to track the animal's movement in order to identify feeding and travel habits, and even monitor heart rates.

Livestock and farm animals are not the only animals currently tracked using RFID. Veterinarians are now pushing for all household animals to be tracked using RFID in order to create a system to identify lost and found pets. If all household animals are tagged with LF RFID chips, when they are found, vets can scan their tag to see information such as identification and the owner's contact information. RFID chips that identify all pets on a nation-wide database can help reunite lost pets with their owners.

Another important reason for tagging animals using RFID is to manage exotic and endangered animals on preserves or other wildlife habitats. LF RFID, UHF RFID, and GPS systems are all used in animal management. The specific system selected is usually dependent on the information needed and safety of the animals.

III. PROPOSED SYSTEM

Haar Cascade Algorithm

Haar Cascade is a machine learning object detection algorithm used to identify objects in an image or video.
The algorithm has four stages:
1. Haar Feature Selection
2. Creating Integral Images
3. Adaboost Training
4. Cascading Classifiers

Advantages

1. We can able to train more amount of data
2. High accuracy

Procedure

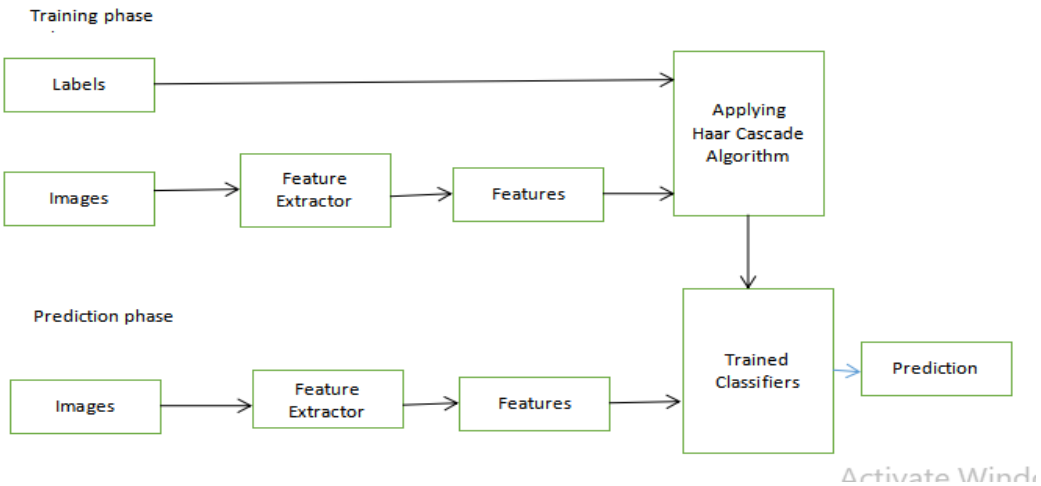
- Haar Cascade classifier is based on the Haar Wavelet technique to analyse pixels in the image into squares by function. This uses “integral image” concepts to compute the “features” detected.
- Haar Cascades use the Ada-boost learning algorithm which selects a small number of important features from a large set to give an efficient result of classifiers then use cascading techniques to detect animal in a input.

Haar features:

- Haar features are similar to convolution kernels which are used to detect the presence of that feature in the given input.

Detect edges using convolution kernels:

- Given a input and convolution kernel, we place kernel to a corner and do convolution multiplication shifting the kernels. This method is used to detect different types of edges using different kernels.



IV. METHODOLOGY

MODULE DESCRIPTION

Data Pre-Processing

In detecting animals associated with the video, the video or image have to be preprocessed in order to detect the animals of the uneven footage, where it can detect the animal according to the algorithm

Data Augmentation

Data Augmentation is a technique that can be used to artificially expand the size of a training data set.

Feature Extraction

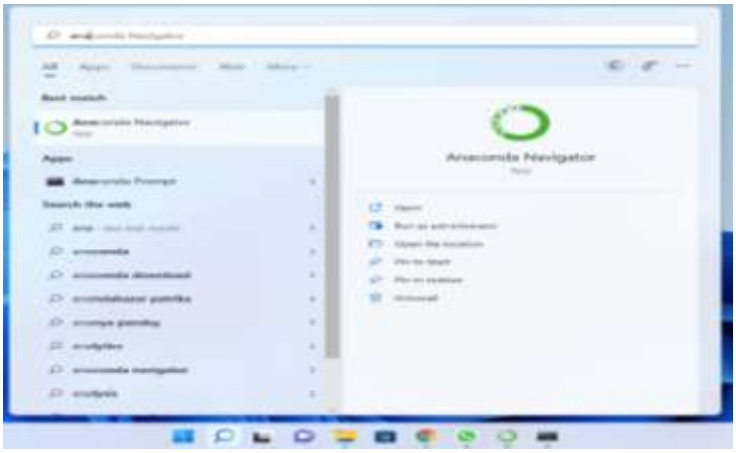
Feature extraction is a process of dimensionality reduction by which an initial set of raw data is reduced to more manageable groups for processing. A characteristic of these large data sets is a large number of variables that require a lot of computing resources to process.

V. RESULT AND DISCUSSION

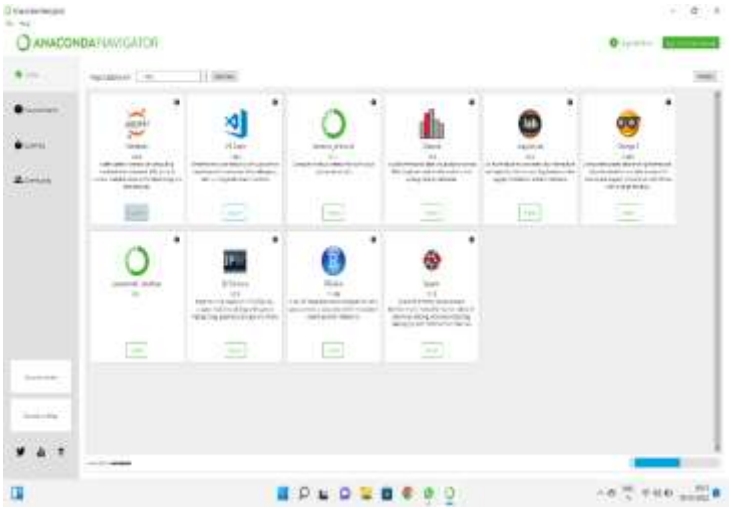
In this experiment, results of our implemented system as well as the relevant details can be divided into 6 consecutive parts which work together:

i. Open anaconda Navigator
ii. And change it to tens
iii. Then launch jupyter
iv. Select the required folder
v. Then paste the video path in the given location
vi. Then get the result

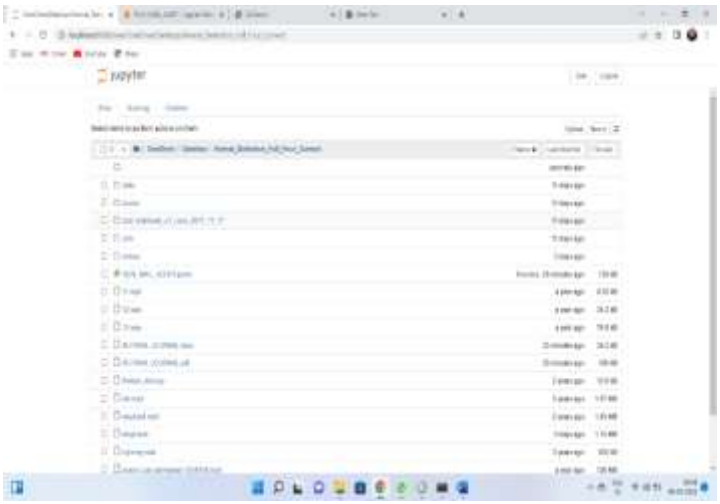
i.Open anaconda navigator



ii. And change it to tens



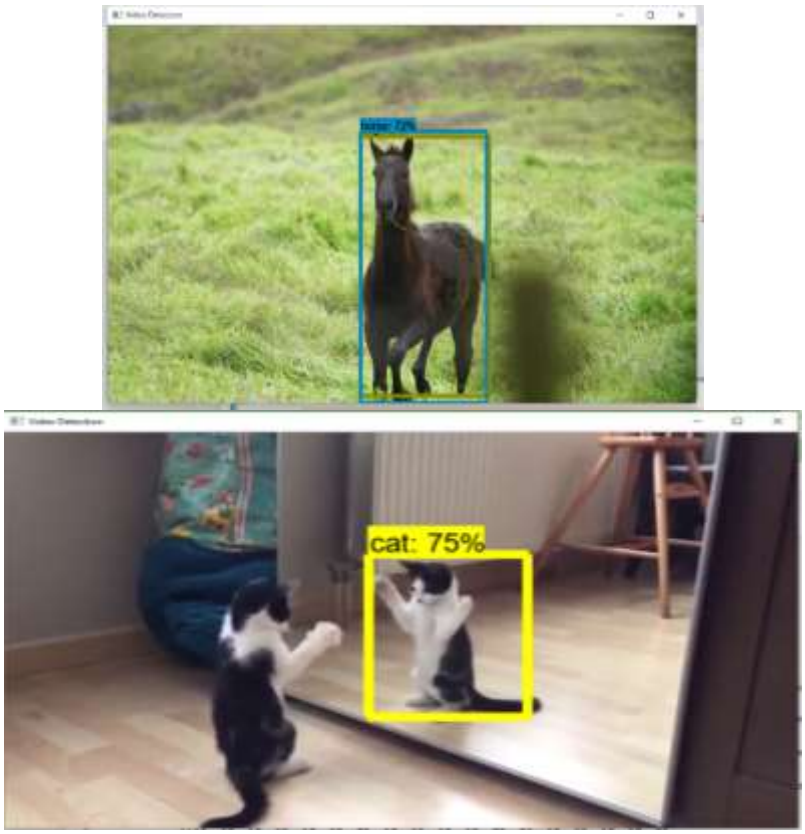
iii. Then launch jupyter



iv. Select the file required

v. Then paste the video path in the given location

vi. Then get the result



VI.FUTURE ENHANCEMENT

Therefore in future we want to extract regions for addressing the location of objects and extract other features as well to get better results.

VII.CONCLUSION

In this report, we first briefly explained our motivation of this project and showed some background materials. Then, we precisely illustrated our task of demonstrating that wild animals' detection can be done sing machine learning algorithm. Features learned from the method called haar cascade to automatically identify animals. Automating animal identification can thus dramatically reduce the cost to extract informative and actionable information from wild habitats, potentially revolutionizing studies of animal behavior, ecosystem dynamics, and wildlife conservation. Therefore in future we want to extract regions for addressing the location of objects and extract other features as well to get better results.

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