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Animal Image Reorganization Using Yolo Algorithm

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ABSTRACT: This research study about image classification by yolo algorithm. This proposed work use an algorithm to detect the animals in wild life. Since there are many different animals manually identifying them can be a difficult task. This algorithm classifies animals based on their images so we can monitor them more efficiently. Animal detection and classification can help the user to know more about animals. The experimental results show that automatic feature extraction in yolo algorithm is better compared to other simple feature extraction techniques (both local- and appearancebased features). It shows that the proposed technique have a positive effect on classification accuracy.

KEYWORDS: animal detection, yolo algorithm, python, android, etc

I. INTRODUCTION

Animal recognition and classification is an important area which has not been discussed rapidly. Animal classification which relies on the problem of distinguishing images of different animal species is an easy task for humans, but evidence suggests that even in simple cases like cats and dogs, it is difficult to distinguish them automatically. Animals have flexible structure that could self-mask and usually they appear in complex scene. Also, as all objects, they may appear under different illumination conditions, viewpoints and scales. There are attempts to apply recognition methods on images of animals but the specific problem of animal categorization has recently attracted limited interest. There are several kinds of approaches for solving this problem with each one having its advantages and disadvantages. The first approach constructs complex features which represents and discriminates sample images better but creating such a feature is complicated and it is problem dependent. The second approach combines the extracted features from different methods and concatenates them to build a more powerful feature vector. Observing wild animals in their natural environments is an important task in ecology. Monitoring wild animals, therefore, is essential as it provides researchers evidences to help make conservation and management decisions to maintain diverse, balanced and sustainable ecosystems in the face of those changes, Various modern technologies have been developed for wild animal monitoring, including radio tracking, wireless sensor network tracking, satellite and global positioning system (GPS) tracking, and monitoring by motion sensitive camera traps.

II. RELATED WORK

In studied about Convolutional Neural Network. as a method for the image classification. The framework consists of a combination between mimics of two pairs human eye and variation sequence auto-encoding. According to [2], the journal discussed on image classification system based on a structure of a Convolutional Neural Network (CNN). The training was performed such that a balanced number of animal images were used for training by deriving additional animal images from the animal images data. The image classification system employs the biscale CNN with 120 trained data and the auto-stage training achieves 81.6% detection rate with only six false positives on animal Detection

Data Set, where the current state of the art achieves about 80% detection rate with 50 false positives. From [3] the research used Decision Tree (DT) as the techniques in image classification. The DT has multiple datasets that are located under each of Hierarchical classifier. It must be done in order to calculate membership for each of the classes. The classifier allowed some rejection of the class on the intermediary stages. This method also required of three (3) parts which the first one is to find terminal nodes and second in the placement of class within it. The third one is partitioning of the nodes. This method is considered very simple and high rate of efficiency.

III. METHODOLOGY

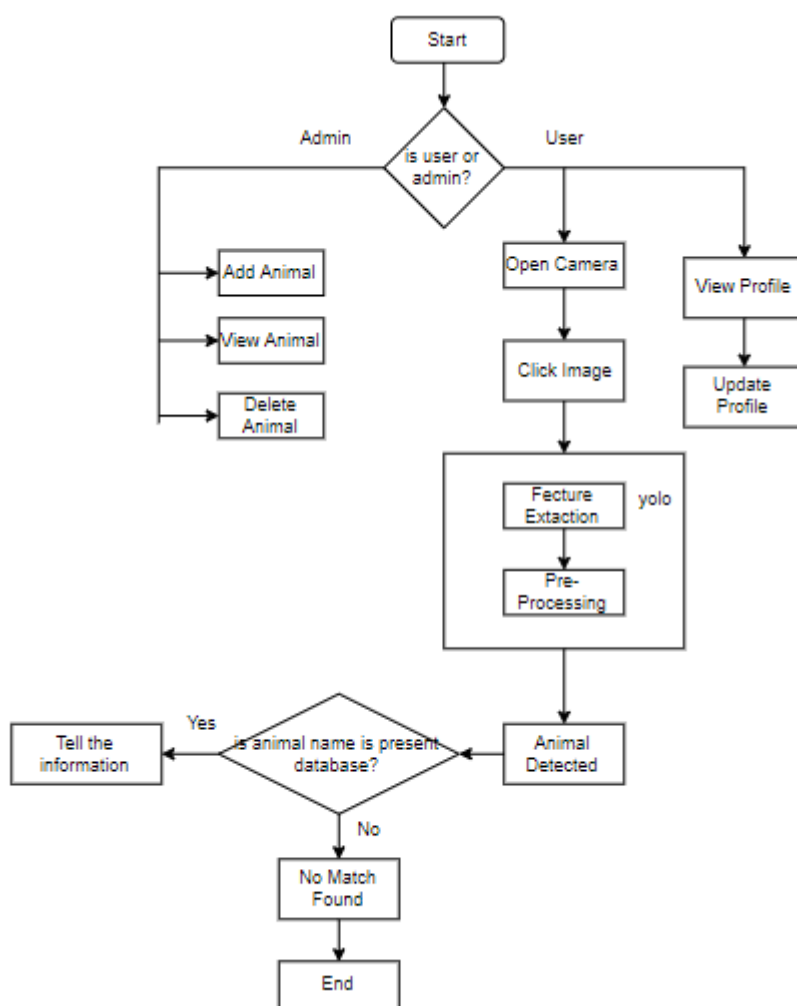


Fig:1 Proposed System

In this project, System proposea animal Detection through yolo algorithm. To overcome the drawbacks that were in the existing system we develop a system that will be very useful for any investigation department. Here the program keeps track of images from different sides. Based on this record number the program retrieves the personal record of the suspect (which face from comparing and get result more than 90 percent match then show as animal is identified.

Algorithms based on classification. They are implemented in two stages. First, they select regions of interest in an image. Second, they classify these regions using convolutional neural networks. This solution can be slow because we have to run predictions for every selected region. A widely known example of this type of algorithm is the Region-based convolutionalneural network (RCNN) and its cousins Fast-RCNN, Faster-RCNN and the latest addition to the family: Mask-RCNN. Another example is RetinaNet.

Algorithms based on regression – instead of selecting interesting parts of an image, they predict classes and bounding boxes for the whole image in one run of the algorithm. The two best known examples from this group are the YOLO (You Only Look Once) family algorithms and SSD (Single Shot Multibox Detector). They are commonly used for real-time object detection as, in general, they trade a bit of accuracy for large improvements in speed.

YOLO algorithm works using the following three techniques.

1. Residual blocks
2. Bounding box regression.
3. Intersection over Union(IOU).

Residual blocks

The image is divided various grids. Each grid has a dimension of $S \times S$. The following image shows how an input image is divided into

Bounding box regression

A bounding box is an outline that highlights an object in an image. Every bounding box in the image consists of the following attributes

1. Width (bw)
2. Height (bh)
3. Class(for example animal) this is represented by letter C.
4. Bounding box center(bx,by).

YOLO uses a single bounding box regression to predict the height, width, center, and class of objects. In the image above represent the probability of an object appearing in the bounding box.

Intersection over union (IOU)

Intersection over union (IOU) is a phenomenon in object detection that describes how boxes overlap. YOLO uses IOU to provide an output box that surrounds the objects perfectly. Each grid cell is responsible for predicting the bounding boxes and their confidence scores. The IOU is equal to 1 if the predicted bounding box is the same as the real box. This mechanism eliminates bounding boxes that are not equal to the real box.

Combination of the three techniques

The following image shows how the three techniques are applied to produce the final detection results.

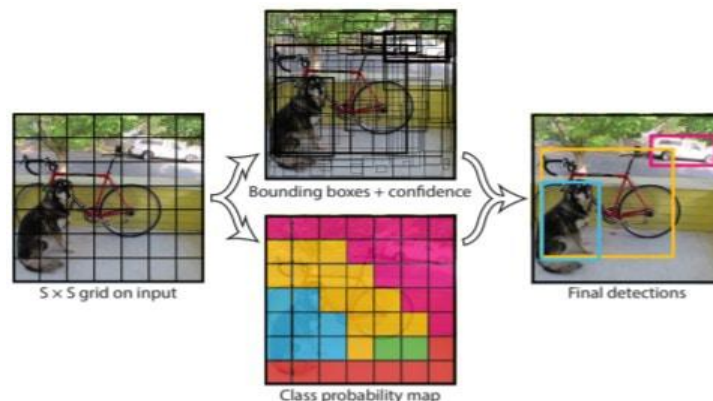


Fig.2 Combination Of Techniques

First, the image is divided into grid cells. Each grid cell forecasts B bounding boxes and provides their confidence scores. The cells predict the class probabilities to establish the class of each object. For example, we can notice at least three classes of objects: a car, a dog, and a bicycle. All the predictions are made simultaneously using a single convolutional neural network. Intersection over union ensures that the predicted bounding boxes are equal to the real boxes of the objects. This phenomenon eliminates unnecessary bounding boxes that do not meet the characteristics of the objects (like height and width). The final detection will consist of unique bounding boxes that fit the objects perfectly. For example, the car is surrounded by the pink bounding box while the bicycle is surrounded by the yellow bounding box. The dog has been highlighted using the blue bounding box.

IV. EXPERIMENTAL RESULT

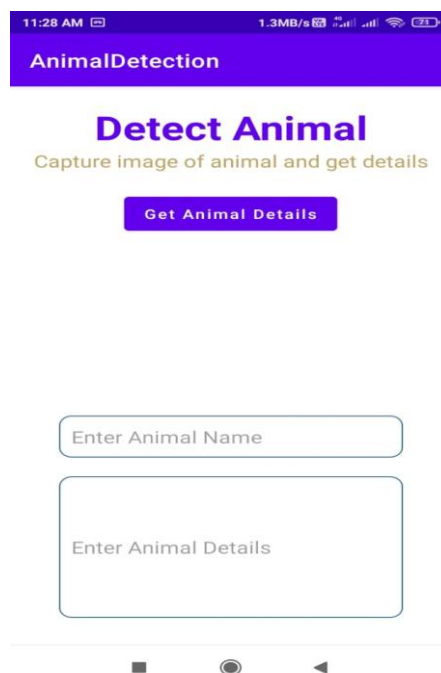


Fig.3 Detection

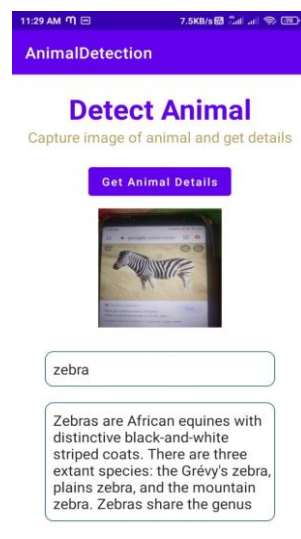


Fig.4 Animal Detected

V. CONCLUSION

The paper presents a proposed well-known yoloalgorithms for the image recognition, feature extraction and image classification. In this system we have implemented a animal identification system which will record animal according to yoloalgorithms. It will save time and effort, especially if it is a social place. Automated animal identification System has been envisioned for the purpose of reducing the drawbacks in the traditional (manual) system.

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