WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Animal Detection Using Yolo Coco Model

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ABSTRACT:

Over the last few years, there has been a steady rise in number of reported human–animal conflicts. While there are severalreasons for increase in suchconflicts, foremost among them is the reduction in forest cover. Animals strayclose to human settlements in search of food, and often end up raiding crops or preying on cattle. There are at times human causalities as well. Proficient, reliable, and autonomous monitoring of human settlements bordering forest areas can help reduce such animal–human conflicts. A broad range of techniques in computer vision and deep-learninghas shown enormous potential to solve such problems. In this paper, a novel, efficient, and reliable system is presented which automatically detects wild-animals using computer vision. The proposed method usesthe YOLO object detection modelto ascertainpresence ofwild animals in images. The model is fine-tuned for identifying ten different types of animals (Dog, Horse, Butterfly, elephant, Hen, Cat, Cow, Sheep, Spider, and Squirrels). The proposed method achieves anaccuracyof98.8% and 99.8% to detect animals.

Introduction:

In the recent few years, diverse research work happened to develop a practical approach to accelerate the development of deep learning methods. Numerous developments accomplished excellent results and followed by continuous reformations in deep learning procedures. Object localizationisthe identificationofallthe visuals inaphotograph, incorporatingtheprecise location of those visuals. By using deep learning techniques for object identification and localization, computer vision hasreached a new zenith. Dueto significant inconstancies in viewpoints, postures, dimensions, and lighting positions, it is challenging to succeed in the identification of objects perfectly.Accordingly, considerable concern has been given by researchers to this area in the past few years.These techniques create region proposal networks (RPN), and then the region proposals are divided into categories afterward. On the other side, object detection algorithms usingregression includes SSD and YOLO, etc. These methods also generate region proposal networks (RPN) but divide these region proposals into categories at the moment of generation. All of the procedures mentioned above have significant accomplishments in object localization and recognition. YOLO consolidates labels in diverse datasets to form a tree-like arrangement, but the merged labelsare not reciprocallyexclusive. research inthe field.The main intent ofthispaper isto describe the design for a computer visionsystem, capable of detecting animals. DNN'scould be leveraged to detect the presence of animals in the captured images.In addition to detecting the presence of an animal, in order to effectively trackthem and monitor their actions, it is also necessary to localize the animals withintheimage.This is the task of object detection. Object detection systems predictregions of interest within images, and in addition classify entities within theseregions. Thus, object detection is the ideal choice for the system proposed in thispaper.This paper introduces a novel method of reducing human animal conflicts,through constant and automatic monitoring of vulnerable areas using a systemof cameras.Artificialintelligence (AI) is the abilityofa computer programor amachine tothink andlearn. It is also a field of study which tries to make computers "smart". As machines become increasingly capable, mentalfacilities once thought to require intelligence are removed fromthe definition. AI is an area of computer sciences that emphasizes the creation of intelligent machines that work and reacts like humans. Some of the activities computers with artificial intelligence are designed for include: Face recognition, Learning, Planning, Decision making etc. Artificial intelligence is the use ofcomputer science programming to imitate humanthought and action by analysing data and surroundings, solving or anticipating problems and learning or self-teaching to adapt to a variety of tasks.ObjectDetectionandTracking.There is a wide range of computer vision tasks benefiting society such as object classification, detection, tracking, counting, SemanticSegmentation, Captioning image, etc.Process of identifying objects in an image and finding its position is known as object detection. Various object detection tasks. With advancements in field of computer vision assisted by AI, realization of tasks was realizable along t time scale. Semantic segmentation task of clustering pixels based on similarities. Classification + Localization and object detection method of identifying class of object and drawing a bounding box around it to make it distinct. Instance segmentation is semantic segmentation applied to multi objects. The general intuition to perform the task is to apply DNN over theimage. DNNworkson imagepatchesto carryout thetask many suchsalient regionscan be obtained by Region-Proposal Networks like Region Convolution Neural network (RCNN), Fast-Region Convolutional Neural Network (Fast-RCNN), Faster- Region Convolutional NeuralNetwork (Faster-RCNN). To perform selective search for object recognition Hierarchal Grouping Algorithm is used. Few bottlenecks by these approaches are mitigated by state-ofthe-art algorithms like You Only Look Once (YOLO), Single shot Detector (SSD). The efficient object detection algorithm is one which assures to give bounding box to all objects of vivid size to be recognized, withgreat computationalcapabilities, faster processing. YOLO and SSD assure to render promising results, but haveatradeoffbetweenspeed and accuracy. Hence, selectionofalgorithmisapplication specific.

EXISTING SYSTEM

Our Existing system describes a system for segmentation of animals from images.

▸ The procedure employed uses a multi-level iterative graph cut to generate object region proposals and accurately recognize regions of interest.

▸ This is especially useful when the animal blends together with the background and is difficult to identify.

▸ These proposals segmented into background and foreground in the second stage. Feature vectors are extracted from each image using AlexNet.

DISADVANTAGESOFTHEEXISTINGMETHOD

i. Itcannotgiveanaccuracyvalue.
ii. Lessstorage
iii. Lessperformance

PROPOSED SYSTEM

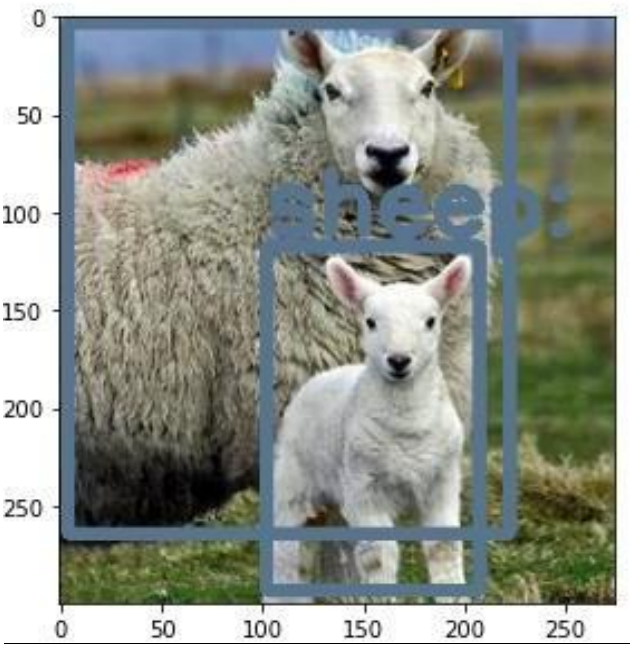
- The proposed method uses the YOLO object detection model to ascertain presence of wild animals in images.
- The model is fine-tuned for identifying Ten different types of animals (Dog, Horse, Butterfly, elephant, Hen, Cat, Cow, Sheep, Spyder, Squirrels.)
- The proposed method achieves an accuracy of 98.8% and 99.8% to detect animals respectively.

The system proposed in this paper uses a network of cameras, connected to PIRmotion sensors, so that image capture is triggered only when some movement isdetected. This enables power conservation. The images captured through thesecameras are processed to detect presence of wild animals, and if an animal isfound, identify the species. Once identified, the animals are tracked for a suitabletime in order to determine their intent – such as to find whether they are movingacross the village, or into it. In the latter case, alerts are generated and localauthorities are notified through proper channels. Understanding the intent goesa long way to reduce false positives, either due to a false detection or when thereis no actual threat posed due to presence of the animal.

ADVANTAGES

- Easily detection with the help of Yolov3 and SSD
- HighAccuracy
- GoodPerformance

RESULT:



FUTURE ENHANCEMENT

Continue to concentrate on expressive search including fuzzy keyword search, semantic keyword search, and so on. Besides, the secure channel utilized in our LFGS system should be eliminated assecure channelwillincur highcommunicationburden. Stillneed to further improve the efficiency of LFGS system so that it can be applied in various schemes.

CONCLUSION:

The proposed system detects the animals using computer vision. The proposedsystem iscost-effective and highly efficient, with an average accuracy of 98.8% indetecting and identifying animals in images. Although the prototype describedin this paper is trained to recognize tendifferent species of animals, it is easilyextendable to detect other types of animals with sufficient trainingdata. The choice ofspecies canalso be regionspecific, therebyproviding a uniqueedge over other existingsolutions. Such a system if implemented on a large scale,has potential to detect large data of animal categories.

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