

ELEPHANT REPELLENT DEVICE USING IMAGE PROCESSING

Sinu varghese¹, Hannah mary wilson², Dr. Anoop T.R³, Amol Joy⁴, ⁵Tom J kuriakose
^{1,2}UG students, ³Associate Professor, ^{4,5}Assistant Professor
 Electronics and Communication Engineering
 Mar Baselios Christian College of Engineering and Technology, Kuttikkanam, India.

Abstract- Object Detection algorithms find application in various fields such as defense, security, and healthcare. Mobilenet tensorflow method in machine learning is used to detect elephant in the forest border areas in this paper. Ultrasound which is defined as vibrations of the same physical nature as sound but with frequencies above the range of human hearing is mainly used here to scare away the elephants. Here we use ultrasound generator as the sound system. The greatest advantage of this system is that this system only work when it detect an elephant in spite of other things. The ultrasound generator won't do any harm to both humans and animals. A night vision camera has been already existing with the raspberry pi which is the hardware used. Further, various challenges and applications of Object Detection methods are elaborated.

Keywords-elephant detection, tensorflow, moblinenet, ultrasound system.

I. INTRODUCTION

Farmers who live near wild elephant reserves and those who view elephant menaces that can lay waste to a year's salary in the single night. Finding solution to this problem is one of the tedious tasks. People who are living near the forest border are greatly affected by the destruction caused by elephants. Crops which are cultivated by the farmers are destroyed by elephants in a single night. There now exist only some natural methods, but these are not completely applicable. Some of the natural methods are using noise makers (vehicle horns, fire crackers), bright lights, buzzing of bees, smoke, fire. These methods are seem to be more difficult to people. To overcome this we found a technical method. By using ultrasound waves with the help of image processing we can scare the elephants which is not harmful for both the elephant and people. This device is very eco-friendly and will protect people from elephants. Won't do any harm to both.

II. RELATED WORKS

A. Tracking-based deer vehicle collision detection using thermal imaging

Deer vehicle collision (DVC) is constantly a major safety issue for the driving on rural road. This justifies several makes an attempt making an attempt to find ruminant on road. However, little or no success has been achieved. So as to scale back the amount of DVCs, this work centered on the study of victimization an infrared thermal camera with pursuit system to find the presence of ruminant to avoid DVCs. The example consists of an infrared thermal temperature image grabbing and process system, which incorporates an infrared thermal camera, a frame disagreeable person, a picture process system and a motion pursuit system, which incorporates two motors with their motion system. By analyzing the infrared thermal pictures that are freelance of

actinic ray, the presence of an animal may be determined in either night or day time through pattern recognition and matching

B. Human-animal recognition in camera trap images

Camera attracts a picture detector that's wide utilized in observation variety, distinguishing and chase species in natural life. During this study, we have a tendency to investigate human-animal distinction in image knowledge set obtained from camera traps for the aim of importing detection and hindrance. The experiments are conducted on totally different sort of knowledge set specified original knowledge set are separated by pictures captured in night and day light-weight. The opposite one is obtained by dividing knowledge set indiscriminately as equal range of human and animal pictures. The experimental results show that color bar chart options on random forest formula offer continually best accuracy results for all knowledge set. Moreover, the pictures captured in night offer additional accuracy than the pictures captured in day light-weight for all classification algorithms.

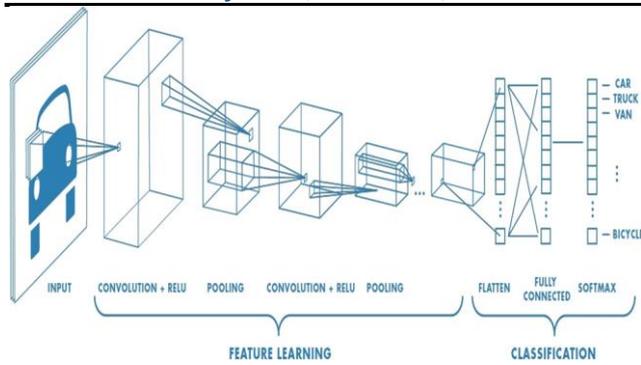
III. SYSTEM DESCRIPTION

A. PRINCIPLE

The object detection, in this case, the elephants is detected by a 180 degree rotating web camera. This web camera is placed near the forest borders. This achieved by using mobilenet telnet model in machine learning for object tracking. clusters the object that is detected in frames. Mask identifies the correct object by comparing the image which is already saved. It has to satisfy the comparison algorithm. If it does, the ultrasound generator which is connected to the hardware will turn on at the same time. Raspberry pi 3 model B+ is the hardware which is used here.

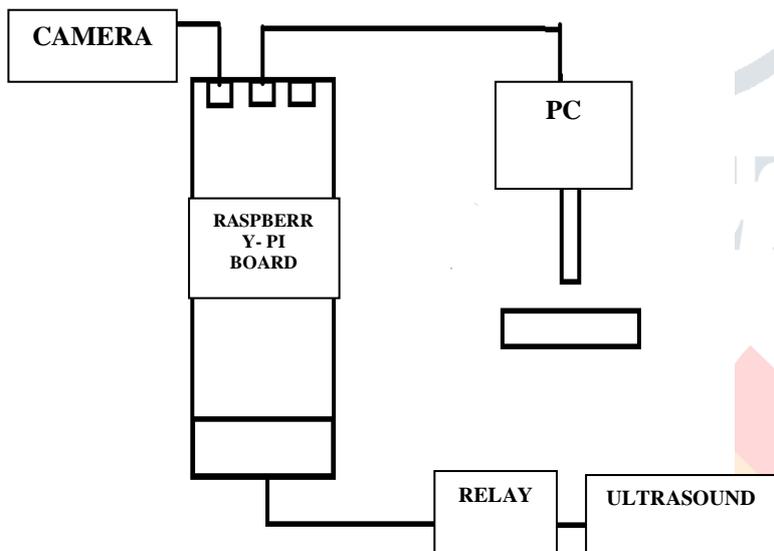
1. MOBILENET

MobileNets are small, low-latency, low-energy models parameterized to fulfill the useful resource constraints of an expansion of use cases. They can be built upon for classification, detection, embeddings and segmentation similar to how other famous massive scale models, which includes Inception, are used. MobileNets may be run efficaciously on mobile devices with TensorFlow Mobile. MobileNets exchange off between latency, length and accuracy at the same time as evaluating favourably with famous models from the literature. Choose the proper MobileNet model to fit your latency and length finances. The size of the community in memory and on disk is proportional to the variety of parameters. The latency and power utilization of the community scales with the variety of Multiply-Accumulates (MACs) which measures the wide variety of fused Multiplication and Addition operations. Accuracies were computed through evaluating using a single photograph crop.

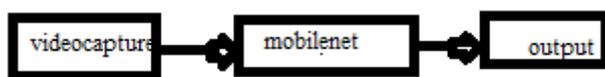


Block diagram of mobilenet

BLOCK DIAGRAM



OBJECT DETECTION



2. CONVOLUTIONAL NEURAL NETWORK

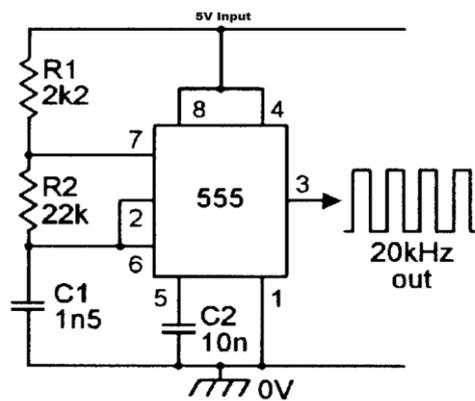
Neural networks are presently attaining things that no different device mastering set of rules can reap. With big datasets and computers capable of processing and optimizing towards the ones large datasets, neural networks have received reputation inside the latest years. They may be super at learning from the datasets and growing fashions of the records. Our assignment uses TensorFlow, a framework furnished for deep gaining knowledge of, to model our neural network. This API is used to detect more than one gadget in actual-time video streams. SSD MobileNet, a predefined model supplied through TensorFlow is used as the base and exceptional-tuned to improve the accuracy and the range of items that can be detected. This version can be trained for any custom object that is required by means of the consumer to preserve a song of that object. As soon as the gadget is well-equipped to hit upon objects, it is educated to music the object as long as it's far within the range of digital camera. It is thrilling to examine how even gadgets themselves can be a supply of facts that can be used to come across their behavioral styles by means of monitoring their movement. This analysis of the objects reveals applications in domestic automation and protection. 2nd trajectories of the items captured by the digital camera are fed as enter to monitoring and sample detecting set of rules

3. OBJECT DETECTION BY USING TENSORFLOW

We optimize the employee service for going for walks massive graphs with low overhead. Our modern-day implementation can execute tens of thousands of sub graphs consistent with 2nd, which allows a large variety of replicas to make fast, fine-grained education steps. The worker service dispatches kernels to nearby devices and runs kernels in parallel while feasible, for instance by way of the usage of multiple CPU cores or GPU streams.

Prunes the graph to achieve the sub graph required to assess the nodes requested by using the patron, walls the graph to reap graph pieces for every collaborating tool, and caches those portions in order that they may be re-utilized in next steps. Since the master sees the general computation for a step, it applies preferred optimizations along with not unusual sub expression removal and regular folding. It then coordinates execution of the optimized sub graphs across a set of obligations.

It's a method for constructing a pc program that learns from information. It is based totally very loosely on how we suppose the human brain works. First, a collection of software "neurons" are created and related together, letting them send messages to each different. Next, the network is asked to clear up a trouble, which it attempts to do over and over, on every occasion strengthening the connections that lead to fulfillment and diminishing people who result in failure. For a greater specific introduction to neural networks, Michael Nielsen's Neural Networks and Deep Learning is a good vicinity to start. For a more technical evaluate.



Block diagram of configuring 555 IC

Elephants will communicate by this suggests over huge areas. Elephants are ready to communicate with others UN agencies are at intervals a radius of one hundred sq. kilometres. The air temperature at intervals 300m of the bottom causes inverted low-frequency sounds to dissolve into the atmosphere. However, once the temperature drops, these sounds are mirrored back onto the bottom so the sound carries higher. So, sunset is that the best time for elephants to speak over giant areas.

Infrasound communication permits for distress signals to be carried for several kilometres. This alerts fellow elephants to dangers or pressing pleas for help, or informs them of a feminine causing out oestrus calls. This accounts for the fast reaction in elephants once the human observers' area unit unaware of any form of sound. Once Associate in elephant has detected Associate in nursing infrasound decision, it'll at once stop what it's doing so as to listen. Females build use of this ability in causing out oestrus calls because the time within which they'll mate is proscribed. human action their availableness permits bulls from a so much wider space to own the chance to mate together with her, increasing her probabilities of bearing a robust, healthy calf (as she decides that bull she is going to accept).

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