IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Artificial Intelligence Based Birds and Animal Detection and Alert System

Bhavana. C[1], Yashaswini.M[2]
M. Tech Scholar[1], Assistant Professor[2]
Department of Electronics and Communication EngineeringBangalore Institute of Technology, Bangalore, India

Abstract:

The invasion of monkeys in cities, the invasion of plants by wild boars, birds, and other aspects of human-animal conflicts may be found all over the world. The preservation of the agriculture industry is currently one of the biggest problems in providing effective human and animal conflict resolution. Among the biggest difficulties facing humanity today is finding answers to the conflict among humans and animals. Making a wire fence along the edges of a permanent habitation is a typical option used by people. However, this strategy has a lot of implications and cannot be applied everywhere. The limits of the conventional technique have occasionally been overcome by the development of varioustechnical intrusion detection solutions. Entry detection is a type of targeted motion monitoring technology in the environment. It will alert and remind eligible employees during the intervention. There are many methods and systems for resolving conflicts between humans and like video, GPS, RFID, and ultrasonic.

Keywords- Artificial Intelligence, Bird/Animal, Detection, Alert System.

I. INTRODUCTION

The ecology depends on wildlife to maintain the natural balance of the environment. The population of all wildlife species has been recovered since the wildlife conservation law was passed and put into effect, successfully protecting wildlife resources. Numerous examples of confrontations between people and animals may be found throughout China, such as the risks of monkeys in populated regions, the invasion of wild boars, etc. Animals who are attacked temporarily lose their meticulously crafted existence, making it incredibly challenging for them to return to normal. The production and way of life of humans have been significantlyimpacted by damage to crops and agricultural machinery. Entry detection is a type of targeted motion monitoring technology in the environment. It will alert and remind eligible employees during the intervention.

There are many methods and systems for resolving conflicts between humans and like video, GPS, RFID, and ultrasonic. However, such techniques have some limitations in actual use. There will blind patches because of the locationof the camera, for instance, if a camera is utilized for authentication verification. GPS, RFID and ultrasonicmonitoring may be required to cover the cost of expensive hardware, or require specific device management.

The major objective in these circumstances is to automatically drive away wild creatures without losing both human and animal lives. The suggested approach beats themsince it only requires maintenance software code, unlikemanual methods, which also require labor and periodic maintenance on devices that can detect animals. When takenby a camera, wild animals can be identified using the convolutional neural networks (CNN) technology and the deep learning (DL) idea. When an animal is identified, the appropriate audio can be produced to automatically scare it away.

II. OBJECTIVE

The project's major goal is to keep wild animals away from agricultural fields while also safeguarding them by frightening them rather than killing them. Discover birds, animals such as cattle and humans using Artificial Intelligence and lifta bell and play an awesome human voice. Play Bell and recordhuman sound every 10 minutes to scare birds in the morning hours from 6am to 8am and 4pm to 6PM using a real-time clock. Manually control the device remotely using GSM on / off or start the process.

II. LITERATURE SURVEY

[1]Bird flocks have the potential to seriously harm ripening fruit plants. Numerous techniques for frightening birds are employed to solve this issue, but frequently the birds become distracted as well as the intended effect of the panic process is lost. We developed the herd detection method and activation activator that will only shock things if the herd passes througha guarded area to assist relieve the problem. A convolutional neural networks was used to carry out the actual detection utilizing artificial intelligence. We used video cameras and a new method to get everything moving quickly before trainingthe network. These items were labelled and utilized for network validation, testing, and training. Boundary accuracy, memory, and F1 score must all be tested while testing test algorithms. [2] In forestry and agricultural areas, human conflict is a major problem where large numbers of resources and human health are at stake. As a result, People are losing their crops, livestock, property, and sometimes their lives. So,the area should be monitored regularly to prevent the entry ofwildlife. In this regard, we have made an effort to develop a system that will monitor the sector. Which means that at first it will see the intruder using a sensor, then the camera will takea picture of the criminal and separate them using the image processing and then take the appropriate action based on the

[3] A sensor is made from the fence wire. The area will be paused and receive the initial input signal that signals the existence of animals when fencing when animals come into touch with this exposed wire. The circuit sent us on for further thought after receiving the initial incoming signal and an amplifier. With a slight control, it will be as such. As soon as our program is activated, the buzzer will sound, the light will glow at night, and the farmer will receive a message. Solar cells or other power sources that can be controlled will provide the power supply [4] As human and animal safety are equally important, it is important to overcome the above problems and achieve our goal, we use machine learning to find animals, we enter our farm through the concept of a deep neural network, the division of computer vision. In this operation, we willperiodically monitor the entire farm using a camera that will recordaround you all day. We track the movement of creatures using a machine-learning model, and then we play the right sounds to scarethem away. The many convolutional neural network libraries and ideas that were utilized to build the model are described in this paper.

IV METHODOLOGY

In order to detect birds and other animals in farms and to create an alert system, the project's suggested methodology is based on artificial intelligence techniques. Figure 3.1 shows the functional picture of the AI based bird/animal detection system. The system consists of a Microcontroller (ATmega328), GSM, Camera, AI based video/image processing unit, Buzzer and RTC. Here, the controller is the heart of the proposed system and this controller isconnected to communication devices like GSM and Buzzer. Camera is located in the farms and it detects the images through video processing unit and sends it to the microcontroller.

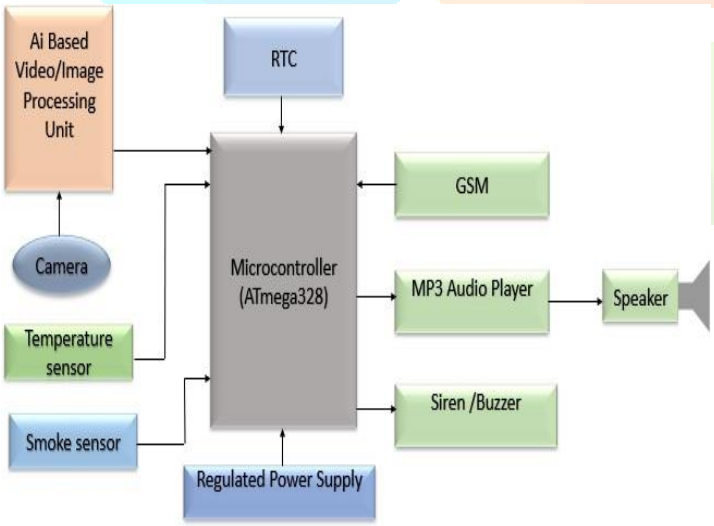

Fig 1: Block Diagram of the birds and animalDetection and alert system

Working of the proposed system

As soon as connects the power supply to the system microcontroller input/output pins, Timer, UART, LCD, Camera will get initialized. Microcontroller Unit keeps waiting for AI Model predicted data. AI model will predict whether the captured image is Bird, Human or animal. If the captured image is any one of those then theAI model will send alert data to Controller. After receiving alert data from AI model Microcontroller will play recorded audio with a scary voice and the buzzer will raise for 1min.RTC (Real Time Clock) is used tonote the live time and the controller will activate morning from 6 AM to 8 AM and evening 4 PM to 6 PM during these hours scary audio will play and an Alarm sound will play for every 10 min once. GSM isused to control the device remotely using mobile, by sending a play command audio voice can be played remotely.

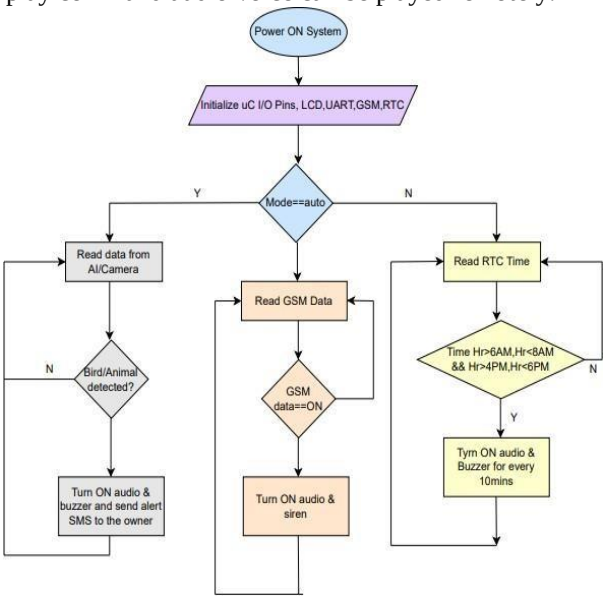

Fig.2: Flow chart of the working modelData Sets

Our model was trained using an image dataset. We see the three types of animals—elephants, boars, andmonkeys—as a threat to Indian agriculture and human existence. The dataset is split into two groups: one for testing and one for validation.

Fig.3: Image Classification

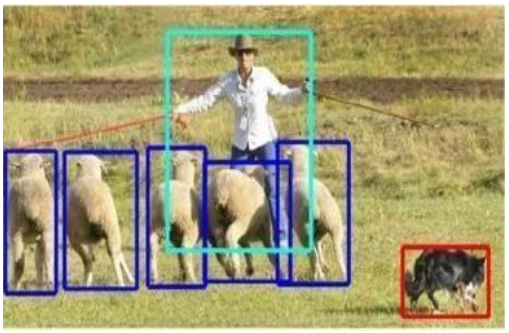

Fig 4: Object Localization

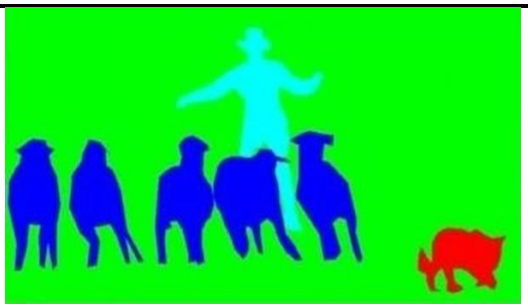

Fig 5: Semantic Segmentation

Fig 6: Semantic Instance SegmentationConvolution neural

network

A feed-forward network called a CNN allows for information flows.One-sided, that is, from entrance to exit. CNN consists of convolutionand union. A layer used to classify images. The input image goes through a convolutional layer and a pooling layer. Then enter the image of the many symbolic parts of the bird was collected It then extracts the features contained in each common part. They are divided and differ in shape, size and color. After that, the CNN model is trained with some images on the GPU. Feature extraction using the above features and the trained dataset it is stored on the target instance server. Finally, we get the information as output. Theend user uploaded an image captured by the camera. So, in the picturewe you can get information from the trained model and predict the view using:

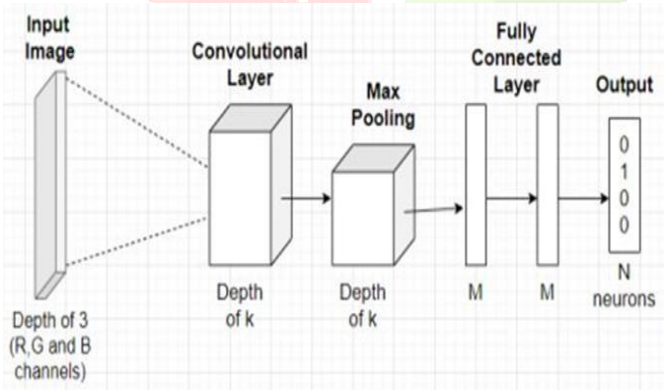

Fig 7: Schematic representation of CNN ArchitectureAlert

through SMS Gateway

As soon as the power supply is connected to the system microcontroller, GSM will get initialized. When any bird/animal is detected in a video processing unit system, an alert will be sent to thecontrol station through a SMS gateway using GSM. At the same timethrough the Buzzer, siren will be turned on in the farms indicating theproblem.

V. RESULTS AND DISCUSSION

Therefore, the suggested model creates a convolutional neural network to train the collection of images of birds and other animals, and this model is then saved. The trained image is compared with the fresh training images from of the live capture using the saved model, which is executed on the driver code. When any of the trained animals is spotted, speakers will emit a repulsive sound to helpthe animal flee. Wild animals damaging crops is now a significant impact on society concern in today's world.

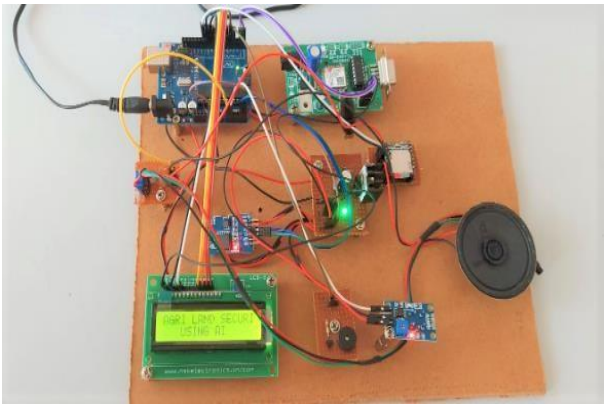

Fig 8: Experimental System setup of AI basedBird/Animal detection and alert system

To put it differently, all farmers must understand that animals are living things that must be guarded from potential harm when used in crop production.It needs immediate attention and a workable solution. Therefore, this project is of great social relevance as farmers protect the fields, save them from significant economic losses and avoid theunproductive efforts they make to protect the fields.

The name of the proposed system will be displayedon the LCD screen. Then when RTC is ON for every 10 minutes the scary voice and buzzer appear. Then automatically system will get activated whenbird/animal is detected in the camera. Then system cam also activate when concerned person give missed call.

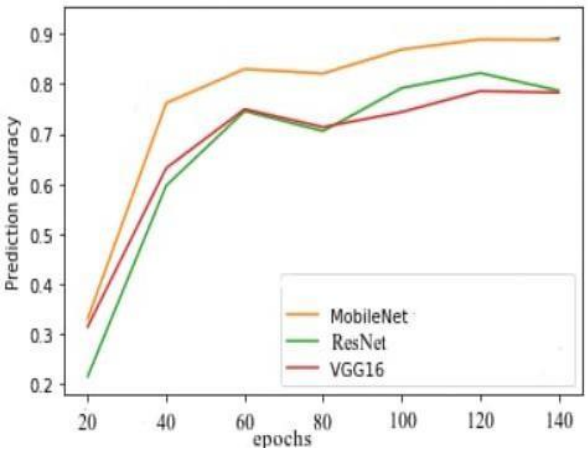

Fig 9: Accuracy graph of the project

TABLE 1: Quantitative Analysis Results

Architecture	Accuracy	Batch size	epochs	Image resolution
Mobilenet	87	128	140	320x320
ResNet	84	128	140	320x320
VGG16	74	128	140	320x320

VI. CONCLUSION AND FUTURE SCOPE

This project conducts research on human and animal invasion. First, the collected data is sent to CNN's automatic feature extraction to see the difference between different types of intrusions. Finally, the function is automatically determined and inserted into various classifiers to achieve intruder detection. The method suggested in thisresearch can detect invasion from both animals and individuals extremely accurately while also increasing detection accuracy with a lot more accuracy than typical extracting information is demonstrating, according to experimental data.

We can implement high speed processing hardware and high-resolution camera to monitor the real time event capturing. Now we are only sending SMS to the owner I, in future we can send real timecaptured videos. We can add more datasets to detect many more animals.

REFERENCES

[1] B. J. M. Stutchbury, S. A. Tarof, T. Done, E. Gow, P. M. Kramer, J. Tautin, J. W. Fox, and V. Afanasyev, "Tracking long-distance songbird migration by using geolocators," Science, vol. 323, no. 5916, p. 896, 2009.

[2] K. Thorup and R. A. Holland, "The bird gps - long-range navigation in migrants." Journal of Experimental Biology, vol. 212,no. 22, pp. 3597-604, 2009.

[3] P. Juang, H. Oki, Y. Wang, M. Martonosi, L. S. Peh, and D. Rubenstein, "Energy-efficient computing for wildlife tracking: design tradeoffs and early experiences with zebranet," in International Conference on Architectural Support fo r Programming Languages and Operating Systems, 2002, pp. 96-107.

[4] V. Dyo, S. A. Ellwood, D. W. Macdonald, A. Markham, C. Mascolo, S. Scellato, N. Trigoni, R. Wohlers, and K. Yousef, "Evolution and sustainability of a wildlife monitoring sensor network," in International Conference on Embedded Networked Sensor Systems, SENSYS 2010, Zurich, Switzerland, November, 2010, pp. 127-140.

[5] P. Sikka, P. Corke, P. Valencia, G. Bishop-Hurley, G. Bishop-Hurley, and G. Bishop-Hurley, "Wireless adhoc sensor and actuator networks on the farm," in International Conference on Information Processing in Sensor Networks, 2006, pp. 492-499.

[6] K. Ohtani and M. Baba, "Shape recognition and position measurement of an object using an ultrasonic sensor array," SensorArray, 2012.

[7] L. Wijesinghe, P. Siriwardena, S. Dahanayake, D. Kasthuriratne, R. Corea, and D. Dias, "Electric fence intrusion System (elealert)," in IEEE Global Humanitarian Technology Conference, 2011, pp. 46-50.

[8] R. Edirisinghe, D. Dias, R. Chandrasekara, and L. Wijesinghe, "Wialert : A wireless sensor network based intrusion alert prototype for hec," International Journal of Distributed & Parallel Systems, vol. 4, no. 1, pp. 75-88, 2013.

[9] L. E. Miller, "A review of ultrawideband technology," National Institute of Standards and Technology, Gaithersburg, Maryland, Tech. Rep., April 2003. [10] P400, "P400 documentation and software," http://www.timedomain.com.

[10] J. C. Sprott, Chaos and Time-Series Analysis. Oxford University Press, 2003.

alert