



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 7, July 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.165

 9940 572 462

 6381 907 438

 ijircce@gmail.com

 www.ijircce.com

Neural Network Based Image Classification for Animal and Bird Intrusion Detection System in Agricultural Area

Spoorthi K L¹, Srusti J R¹, Sushma Rani V¹, Yuktha D Bhushan¹, H V Shashidhara²

Department of Computer Science and Engineering, Malnad College of Engineering, Hassan, Karnataka, India¹

Associate Professor, Department of Computer Science and Engineering, Malnad College of Engineering, Hassan, Karnataka, India²

ABSTRACT : In the forest zone and in the agricultural fields, the main problem is the conflict between people, animal's and bird's vast amounts of resources are lost and human life is at risk. Because of this, people lose crops, livestock, property and sometimes even their lives. So this zone is be continuously monitored to prevent the entry of wild animals. With this in mind, we tried to develop a system that would monitor the field. This means that it first detects field disturbances with a camera that captures intruder image and its classification using image processing. Finally it notifies the farm owner and forest officials using a message.

Rapid increase in human population has led to the conversion of forest land into human settlements. Because of this, wild animals face a shortage of food and water. However, the wildlife suffer due to deforestation, forcing them to move into human habitations. It causing huge loss of property and life. It was reported in the Times of India that more than 1,300 people have died as a result of Tiger, Elephant attacks in India over the past three flight.

People thus face serious danger and time to recover from a huge loss is imperceptible. Human-animal interactions can cause crisis for both species and hence the need for an intelligence surveillance and perception system. Conflicts between humans and animals are increasing at a higher rate. These include a number of factors like Elephant habitat structure, weather, animal life etc. Forest fire is an important hazard which periodically occurs due to natural changes, human activities and other factors. In recent years, forest fires have been constantly increasing causing damage to crops, wildlife and humans.

I. INTRODUCTION

India is an agricultural country. Agriculture has always been the India's most important economic sector. Although most of the population of India depends on agriculture, there are still many problems faced by farmers. Human-animal conflict is a big problem if huge number of resources are lost ,thus human life will be in danger. Lately the number of these kinds of conflicts is increasing. So this zone is to be constantly monitored to prevent the entry of this type of animal, bird or any other unwanted intrusion. Conflicts between humans and animals arise due to encroachment and poaching, people move into the forest to satisfy their livelihood, for claiming land for agricultural practices and fast industrialization causes the expansion of urban land and the entry of animals nearby villages for water in summer due to drought. Elephants or wild pigs trample vegetation on farmland in distress to nutritious food. The need of an animal or a human brings the other into reality danger, in this process resources are corrupted and sometimes many lives are lost. Human-Elephant conflict is more prevalent in South Asia and Africa. Farms are usually protected by an electric fence; an animal that strives for it to enter the field , suffering from electric current with intense pain to cause animals behave abnormally. Monitoring animals in the wild without disturbing them is possible using a camera capture framework, a technique under study wildlife using auto- triggered cameras and produces large volumes of data. However, image collection often leads to image capture low image quality and contains many false positives (images without any animals), which must be detected before the post-processing step. The rapid increase in human population led to the transformation of the forest land into human settlements. As a result, wild animals are facing shortage of food and water. However, the wildlife is very scared due to deforestation which forces them to move into human habitations. This creates a huge loss of property and life. This was the case in the Times of India reported that more than 1,300 people had died due to Tiger, Elephant attacks in India for the last three years. People thus face serious danger and the time to recover from a huge loss is imperceptible. The interaction between humans and animals can cause a crisis for both species, and therefore an intelligence surveillance and perception system is needed. Conflicts

between humans and animals are increasing at a higher rate. A number of factors include Elephant habitat structure, weather, animal life, etc. Forest Fire is an important hazard that occurs regularly as a result of natural changes, human activities and other factors. In current years there is a steady increase in forest fires that cause damage to crops, wildlife and humans. This approach focuses on the detection of animals and bird by sending warning messages.

II. RELATED WORK

[1]. To track the location of an animal in a zoo or national parks, a temperature sensor and a PIR sensor are used. The voice processor will alert people via a pre-recorded voice. The GPS receiver sends the location, temperature of the animal to the controller and it's connected to IOT will provide complete information website on a PC or laptop.

[2]. In animal intrusion detection system using wireless sensor network system, bird intrusion is detected using wireless sensors and buzzers that produce acoustic sounds. This sound irritates the birds. These acoustic sounds that are generated will be created only when birds are detected and continuously for a certain period of time until the birds are chased away.

[3]. A GPS tracking device must be placed with the group leader animal. A virtual border is created around the protection zone. These signals are to be continuously monitored in the base station and when the leader crosses the limit, a warning message is generated. The group can be divided; animals must not follow an animal that has been identified as Leader; also finding an animal leader is a tedious task.

[4]. Wireless sensor network, it is formed by the implementation of motion sensors in various places throughout the field and movement data is continuously communicated to the coordinator via radio frequency transmitter. When motion is detected, an alert message is delivered to the farm owner.

III. PROPOSED METHOD

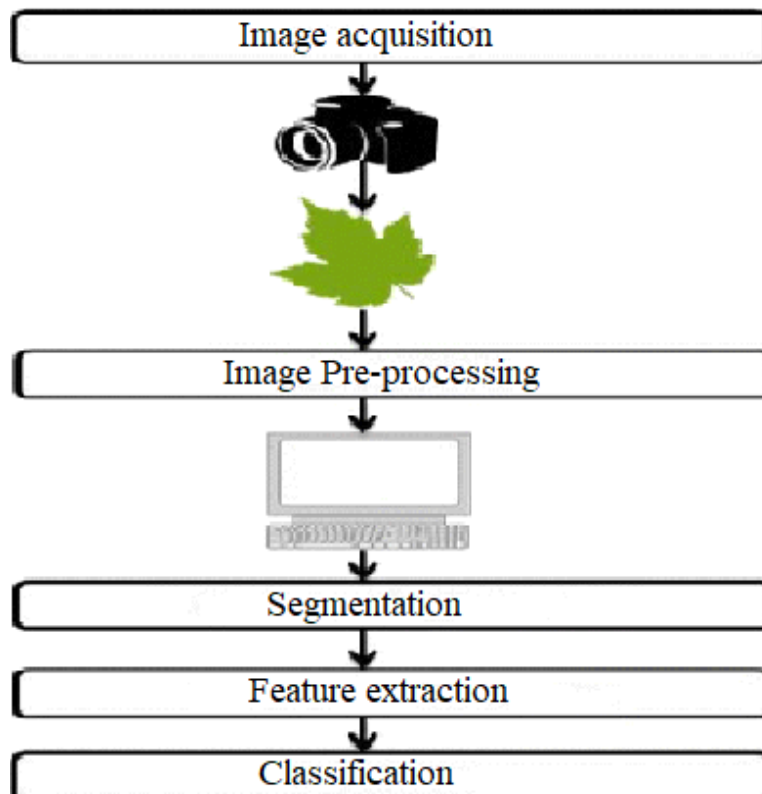


Fig 1: Flow chart of the project

The designed system contains five modules. The initial phase is the image acquisition phase through which the real-world sample is recorded in digital form using a digital camera.

- In the next phase, the research image was subjected to a preliminary processing phase. By taking advantage of its size and complexity the image is reduced.
- Accurate digital information is subjected to a segmentation process that separates the rotten part of the animal samples.
- The feature extraction aspect of image analysis focuses on identifying inherent features of objects present in an image,
- Classification maps data into specific groups or classes.

IV. METHODOLOGY

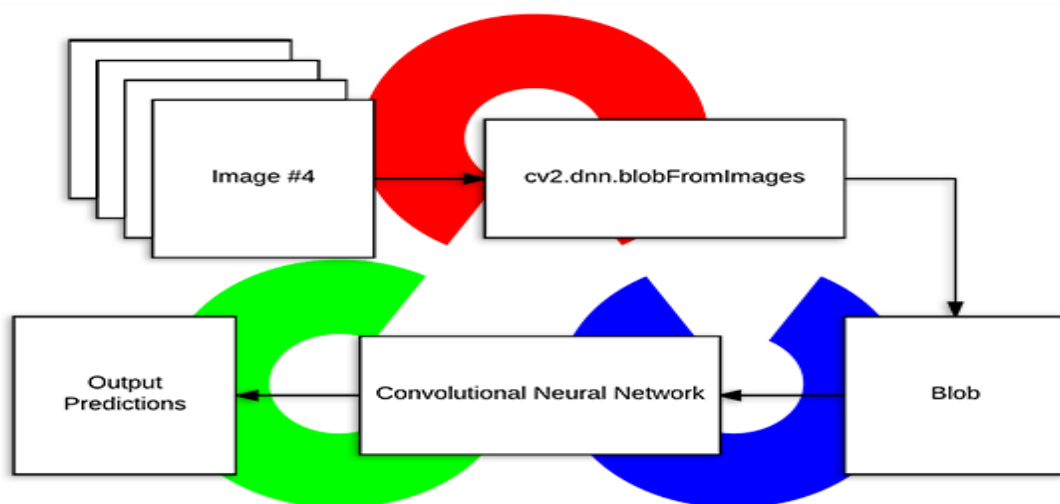


Fig 2: Block diagram of algorithm

The image sent by the camera is received by the PC to classify the animal and birds. A database and a set of sample images are created that are stored in it. The program consists of functions such as Image Index, Image Set and Retrieve Image. A set of images is used to hold a collection of images. Index Image is used to create an image search index. Index Image is used with the fetch image function for searching for pictures. The captured image is passed as a query image to the processing system. The load image function has two arguments, a image query and image stored in database. The result is indices corresponding to images in the image index that are visually similar to the query image. Image ID output contains indices in order from most to least similar match. The value matches the range is from 0 to 1. If the value is 0, then the image does not match. If it is 1, then the query image is the same as the stored image. If it is found between the value 0-1 then the query image falls under the category of the saved image, i.e. the content in the queried image is same as saved image. If the image name matches with the regular expression of the image then the animal is an Elephant, otherwise it is a Leopard. If the score is between 0.1 and 0.9, then the frame is compared to the saved frame. Once the wild animal or bird is identified then the resulting repellent system is applied. If the found animal is an Elephant, a sound will be emitted. If it is found to be a Leopard, then an irritating loud sound is used. Subsequently, an SMS is sent to the forest managers and also to the field owner as warning information. If the detected object is not a threat, then no SMS is sent. In this way, false alarms can be avoided. Once an animal or bird is classified as a threat, action is required.

An SMS alert will be sent to the farmer and the forest official about where the animal is and what kind of animal it was trying to break into the farm. Along with SMS repellent notification a distracting loud noise is used simultaneously with an interval of 2 seconds is applied to the animal and bird. Repellent system works continuously for better effectiveness in scaring the animal or bird. To get (correct) predictions from deep neural networks, you must first need to preprocess your data. In the context of deep learning and image



classification, these preprocessing tasks typically include: Mean subtraction, Scaling by some factor using OpenCV. Deep neural network (dnn) module contains two functions that can be used to preprocess images and prepare them for classification using pre-trained deep learning models. OpenCV provides two functions to facilitate image preprocessing deep learning classification: cv2.dnn.blobFromImage cv2.dnn.blobFromImages These two functions perform mean subtraction and Scaling.

V. CONCLUSION AND FUTURE WORK

Animals and birds, many of which are already threatened or endangered, are often killed in retaliation or to prevent future conflicts. So this zone is be continuously monitored to prevent the entry of wild animals. With this problem in mind, a proposed system is developed that will monitor field using a camera and a captured image of the intruder they will be classified using image processing to take appropriate action accepted.

Some of the future works for this project can be: High range cameras can be used to detect animal and bird intrusion in farms. We can add sensors to the surveilled agricultural areas. This system can also be utilized to connect more surveillance equipment, and a combination of cloud computing might help the system improve significantly.

REFERENCES

1. R.Shanmugasundaram, S.Pavithra, V.Sangeetha, S.Tamilselvan, A.H. Thanveer Ahmed, “An IoT-Based Animal Tracking and Monitoring System in the zoo”, South Asian Journal of Engineering and Technology Vol.3, No.2 (2017) 162–168.
2. Dr. P. Uma Maheswari and Anjali Rose Rajan, “Animal Intrusion detection system using wireless sensor networks”, International Journal advanced research in biological engineering, science and technology (IJARBEST), Vol. 2, Special Issue 10, March 2016.
3. Pammappathi B S, Manjunath PC, “Intrusion detection using passive Infrared Sensor (PIR) ”, Asian Journal of Engineering and Technology Innovation, Volume 4, Issue 7. So-Hyeon Kim, DoHyeun Kim, Hee Dong Park, “Animal Situation Monitoring Service Using RFID, GPS, and Sensors”, 2010 Second International Conference on Computer and Network Technologies, 153 - 156, 2010
4. Shobhit Kumar Nagpal; P. Manojkumar, “Hardware Implementation farm intruder detection via wireless sensor network”, 2016 International Conference on Emerging Trends.



INNO  SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.165

 **doi**[®]
cross **ref**

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 9940 572 462  6381 907 438  ijircce@gmail.com



www.ijircce.com

Scan to save the contact details