

## **A Practical Animal Detection and Alert System Using Computer Vision Technique and modern Microcontroller**

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### **ABSTRACT**

- I.** In villages like Nilgris, Muthumalai, and others, there is a lot of tension between people and animals. People and wild animals often run into each other, which is very bad for farmlands, people, and elephants. The suggested paper works very well and lowers conflicts between people and animals. Wild animals that come into forest edges are tracked with cameras. Based on sensor data, the camera finds the right animal and sends the information to forest officials and people in the town. The animal is matched with specifics of the picture that are saved in a database. The recorded picture is matched with the SURF algorithm. A quick warning needs to be sent to the nearby village. Zigbee is used to send data up to 25 meters away.
- II.** with the help of a microcontroller in and around the forests.

### **INTRODUCTION**

In the prior days, the forest regions are extremely enormous. Because of deforestation, trees are currently worked as huge structures. As the human population is as yet expanding, woodland zones will be totally crushed. Human-

Animal struggle in the general public is for the most part because of lack of nourishment for creatures. Animal aggravation generally happens in the woods fringe regions amongst sunset and first light and it is emphatically regular, comparing with edit collecting periods. This has been the primary driver for almost 80 human passing and more than 300 elephant passing that have been recorded every year in the current past. Rivalry for space is the essential purpose behind clash amongst people and Animals. Wild animals that

escape from the natural life national parks wander into towns making devastation afterward. To counteract such accidents, an appropriate framework is required to contain and screen elephants in national parks. Here we portray diverse ways to deal with identify elephants and conceivable methods for checking the national untamed life parks. The examination, researches and investigations the different location and following methods utilized for before days. Be that as it may, satisfactory and proper technique has not yet grown instead of averting strategy. In this proposed framework, HEC is diminished utilizing the vibration sensor. The vibration sensors are placed on the forest border areas. The arrival of elephant will be detected by sensor and the flag created will be sending to the microcontroller for recognition reason. After the compliance of elephant landing by coordinating procedure the content will be send to the timberland authorities. Taken after by the instant message, the sound is made to alarm the town individuals. Accordingly, our proposed framework will conquer the downsides in the current framework by following and identifying the elephant viably.

In the current framework, Acoustic Sensor is utilized to recognize the vocal recurrence of the elephant. It manages existing strategies through their viability in observing elephant sound without make any mischief them].The sound source is energized utilizing a wide band motion with characterized band width and the flag is caught by every one of the acoustic sensors. An acoustic flag proliferates in a timberland and open zones with a great deal of outer elements that influences the sound spread. The essential target is to decide the acoustic source Direction of Arrival, which is spoken to by the source vector  $u$  that focuses from the sensor to the source. The auxiliary objective is to distinguish the diverse outer elements that influencing the sensor organize scope region and furthermore gauge the blunder examination report and mistake amendment techniques. With a specific end goal to defeat these issues Vibration Sensor is utilized to identify the development of elephant successfully and precisely.

### **III. EXISTING SCHEME**



Fig 1 Human-elephant conflict

#### a) **DISADVANTAGES OF EXISTING SCHEME**

- Uncontrollable noise disturbs the automated detection.
- Insufficiency and abnormality elephant identification.
- Low frequency only detected by acoustic sensor

#### **IV. PROPOSED SCHEME**

In this system camera is used to detect the movement of the wild animal. This camera is placed in the forest border areas. When dangerous arrived in the forest border areas, if it crosses the threshold value the analog input is send to the microcontroller. Microcontroller converts the analog signal to digital signal and the information is passed to the camera using

the serial port connection. Already the camera is in the ON state when the signal reaches from microcontroller to camera features start matching with the actual image with stored image. The images are already stored in the database for finding the animal which is entered in the forest border areas. For features matching SURF (speedup robust feature) algorithm is used to match the unique features of different animals. The images are stored in the blob in the MySQL. Once animal is detected the emergency response is given to the forest officials through e-mail. To alert the village members the information passed through Zigbee protocol. The information from pc is passed to the zigbee transmitter. Using one-to-one connection the information passed to the zigbee receiver. The LCD display is used to alert humans in and around the forest border areas in the form of text. The buzzer or alarm is for alerting

#### **ADVANTAGES OF PROPOSED SCHEME**

- Detection and tracking is powerful.
- Different creatures additionally identified.
- HEC can diminished viably.

## **MODULES OF PROPOSED SCHEME**

1. Wireless transceiver module
2. Advanced micro-controller module
3. Emergency display indimation module

## **SURF ALGORITHM**

Speeded up robust features (SURF) is a patented local feature detector and descriptor. It can be used for tasks such as object recognition, image registration, classification 3D reconstruction. It is partly inspired by the scale-invariant feature transform (SIFT) descriptor. The standard version of SURF is several times faster than SIFT and claimed by its authors to be more robust against different image transformations than SIFT.

To detect interest points, SURF uses an integer approximation of the determinant of Hessian blob detector, which can be computed with 3 integer operations using a precomputed integral image. Its feature descriptor is based on the sum of the Haar wavelet response around the point of interest. These can also be computed with the aid of the integral image.

SURF descriptors have been used to locate and recognize objects, people or faces, to reconstruct 3D scenes, to track objects and to extract points of interest.

SURF was first presented by Herbert Bay, et al., at the 2006 European Conference on Computer Vision. An application of the algorithm is patented in the United States. An "upright" version of SURF (called U-SURF) is not invariant to image rotation and therefore faster to compute and better suited for application where the camera remains more or less horizontal.

The image is transformed into coordinates, using the multi-resolution pyramid technique, to copy the original image with Pyramidal Gaussian or Laplacian Pyramid shape to obtain an image with the same size but with reduced bandwidth. This achieves a special blurring effect on the original image, called Scale-Space and ensures that the points of interest are scale invariant.

## **BLOCK DIAGRAM**

The block diagram consists of two modules as software and hardware module. The process starts with the sensing camera which is to sense the arrival of elephant. when it exceeds then the signal is send to the microcontroller. The analog signal from the microcontroller is send to the PC by serial port communication. The camera is connected to the PC for viewing and capturing the animal image which is then used for matching. The ZigBee transmitter and receiver are used for short distance

communication. The LCD display is used to display the elephant name from the database. The buzzer is connected at the receiver side to provide alert signal. The software module consists of MS-visual studio to develop computer programs and surf algorithm for detecting the interest points on image by using blob detector. The surf algorithm is used to locate and recognize the animal and matching its features.

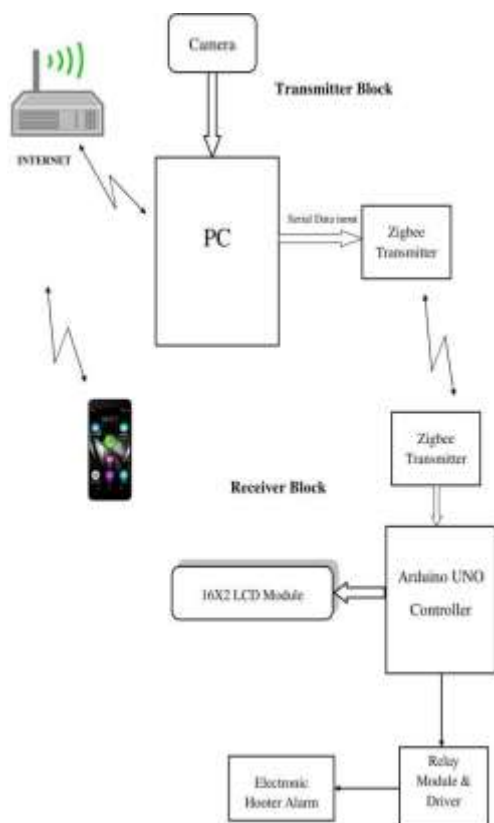


Fig 4.1 Block Diagram of Proposed System

## V. CONCLUSION

The shaking sensor is used in the suggested system to make up for the problems with the sound sensor. The acoustic monitor makes more noise, which makes it harder to find the elephant. That's why a sound monitor is used instead. The analog signal that was sensed is sent so that the picture can be matched and found. The microprocessor sends a signal to the alarm through the Zigbee protocol, which is used for short-range communication. If the animal is not in the camera's field of view, the audio fingerprint program can still tell when an elephant is coming. The buzzer sounds an alarm for everyone in the village. For the whole process, a mobile app was made.

In the future, the automatic sound amplifying gadget could be made to make a lot of noise to scare the elephant. That way, people and elephants won't fight in the forest border area.

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