

IOT Based Motion Pattern Analysis System to Exterminating Harmful Wild Animal

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Abstract:- Surveillance plays a major role in many fields be it at home, hospitals, schools, public places, farmlands etc. It helps us to monitor a certain area and prevent theft and also provides proof of evidence. In the case of farmlands or agricultural lands surveillance is very important to prevent unauthorized people from gaining access to the area as well as to protect the area from animals. Traditional methods of detecting animals in paddy fields and farms include the use of human eyes to witness animal movements. It is not possible for human beings to monitor animal movements continuously throughout the day. So there is a need for specialized detection of animals particularly which enter the paddy fields and farm land of human beings. The methods used for the recognition of the animals include segmentation and object detection process. Various methods aim only at surveillance which is mainly for human intruders, but we tend to forget that the main enemies of such farmers are the animals which destroy the crops. This leads to poor yield of crops and significant financial loss to the owners of the farmland. This problem is so pronounced that sometimes the farmers decide to leave the areas barren due to such frequent animal attacks. This system helps us to keep away such wild animals from the farmlands as well as provides surveillance functionality.

Keywords: Motion pattern analysis system, extermination wild animals, IoT-based system.

1. INTRODUCTION

Agriculture is the main source of livelihood of many people in different parts of the world. Unfortunately farmers are still reliant on traditional techniques that have evolved hundreds of years ago. Due to this the yield of crops are becoming low. Also there are a number of factors that contribute to the low yield of crops animal intrusion is also one among them. In recent years wild animals are special challenge for the farmers throughout the world, Animals like wild boars, elephant, tiger and monkeys etc cause serious damage to crops by animals running over the field and trampling over the crops. It causes the financial problem to the farmers. Farmers with large area of agricultural lands find it very tedious to irrigate their land manually. Crop

damage caused by animal attacks is one of the major threats in reducing the crop yield. Due to the expansion of cultivated land into previous wildlife habitat, crop raiding is becoming one of the most conflicts antagonizing human wildlife relationships.

Due to over population it occurs a deforestation this results in shortage of food, water and shelter in forest areas. So, Animals interference in residential areas is increasing day by day which affects human life and property causes human animal conflict but as per nature's rule every living creature on this earth has important role in eco-system. Agriculture is the backbone of the economy but because of animal interference in agricultural lands, there will be huge loss of crops. Elephants and other animals coming in to contact with humans, impact negatively in various means such as by depredation of crops, damaging grain stores, water supplies, houses and other assets, injuring and death of humans. Farmers in India face serious threats from pests, natural calamities & damage by animals resulting in lower yields Traditional methods followed by farmers are not that effective and it is not feasible to hire guards to keep an eye on crops and prevent wild animals. Since safety of both human and animal is equally vital. So, animal detection system is necessary in farm areas.

2.RELATED WORKS

In [1] S. Santhiya, Y. Dhamodharan, N E. KaviPriya, C S. Santhosh, A smart farmland using raspberry pi crop prevention and animal intrusion detection system , This project is used to protect the farmland from animals by using Raspberry pi. Wild animals are special challenge for the farmers throughout the world. Animals like wild boars, elephants, monkeys etc...cause serious damage to crops. This project utilizes the RFID (Radio Frequency Identification Device) module and GSM (Global System Mobile) modem for this purpose. Forest officer and farmers will get these SMS containing area in which that animals observe. The techniques that already being used is ineffective, in this article we are presenting a practical

procedure toward them off, by creating a system which studies the behavior of the animal, detects the animal and creates the different sound that irritates the animal and also alerts the authorized person by sending a message. The animal can be detected by the RFID injector (for animals), the LF tag which inject under the animal skin. After the detection the intimation is sent.

In [2] Stefano Giordano, IliasSeitanidis and Mike Ojo, Davide Adami, Technology plays a central role in our everyday life. There has been a surge in the demand of Internet of Things (IoT) in many sectors, which has drawn significant research attention from both the academia and the industry. In the agriculture sector alone, the deployment of IoT has led to smart farming, precision agriculture, just to mention a few. This paper presents the development of Internet of Things application for crop protection to prevent animal intrusions in the crop field. A repelling and a monitoring system is provided to prevent potential damages in Agriculture, both from wild animal attacks and weather conditions.

In [3], Isha Dua, Pushkar Shukla, Ankush Mittal, Elephant intrusion in areas with high human movement can prove lethal for both human beings and elephants. The proposed system seeks to identify elephants with the aid of a Video Camera. The suggested methodology was applied to zones having high intervention of human beings and elephants. Regions with higher human movements like roads were extracted from the initial video frames. This process is followed by detecting motion in the video frame. The objects in the area of motion are then identified as elephant or non-elephant with the help of PHOG features and Support Vector Machines (SVM) classifiers. A dataset constituting of images of elephants and other objects was used for training the proposed algorithm. An overall accuracy of 85.29% was attained when static images containing elephants and other objects were classified. The same approach for detection was applied to identify moving elephants in the video frames. The proposed system endeavors to prevent casualties that occur in areas having high human elephant interaction.

In [4], Sheela.S, Shivaram. K., Chaitra. U, Wildlife entering populated areas has recently become common place. The space for wild animals is decreasing as humans are encroaching forests. It creates great loss to property and life when wild animals enter cities. We use latest advances in technology such as Internet of Things (IOT) to create an alert system of possible wildlife leaving the forest. We use low cost motion detectors and single board computer to achieve this. We relay information of such motion to a control center to take further actions. We also propose a deterrent such as making loud noise through speakers which can prevent wild animals from leaving the forest. The basic idea of IOT is to connect different sensors and establish communication and also provide services. In this article, we make use of several IOT devices at the periphery of natural reserve to create an alert system. This system can also be used to find out smugglers and other people illegally entering the forest.

In [5], Mriganka Gogoi and Savio Raj Philip, This work involves protecting the farmland from animals by using Raspberry pi. Wild animals are special challenge for

the farmers throughout the world. Animals like wild pigs, elephants, monkeys etc...cause serious damage to crops. In this project a surveillance camera and GSM module are used. The farmer can check the intrusion of animals and people in his agricultural field and can toggle between few options allowed in order to scare the animal or human away from his field, without the farmer presence in the field. The farmer can control it from a remote area. In this work we are presenting a practical procedure toward them off, by creating a system which studies the behavior of the animals and human, detects and creates the different sound that irritates the animal or humans and also alerts the authorized person by sending a message. The animal or human can be detected by YOLO Framework which was deployed on raspberry pi, in that area if it detect any motion and hence turns ON a camera when movement is detected, thereby providing real time monitoring. It involves automation of certain methods used to prevent them from entering the farmlands and destroying the crops, an electronic fire cracker.

In [6], Altahir A. Altahir1 , Vijanth S. Asirvadaml, Modeling camera coverage is essential in many visual sensor applications. Particularly in visual surveillance, planning the coverage modeling is critical to estimate the coverage and to design the sensor deployment. Given the environment representation, the coverage model produces the sensor coverage based on the device specifications; however, analyzing the visibility in an arbitrary scene is a challenging part. This letter proposes a preliminary setup based on imaging techniques to assist in solving the camera placement problem. The proposed setup computes the camera coverage in a two-dimensional digitized floor-plan. Additionally, a pixelwise line drawing routine analyzes the ray's visibility from the viewpoint to the width of the field of view. Three commercial surveillance cameras are modeled and the obtained result forms the necessary coverage table for subsequent optimization tasks.

3.PROPOSED SYSTEM

The object matched with predefined object of YOLO algorithm, camera will capture a picture and upload it to the server. After capturing the image of intruding animals, the image in the server will get deleted. Intelligence surveillance system that detects the animal through YOLO framework algorithm and sends notification through Mail. It also turns ON buzzer automatically and also farmer can control. In this project we using YOLO file for animal detection and recognition. It also turns ON buzzer automatically and also farmer can control. In this proposed system we will find animal in real time using AI OPENCV After acquisition of image it has to be pre-processed and compressed. Images are used to train the model. It is trained by performing feature extraction on the image to obtain the required pattern in the image. Followed by feature fusion and dimension reduction to compress the image for reliable and real time performance.

BLOCK DIAGRAM

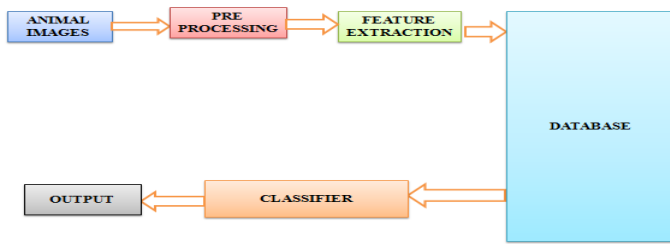


Fig.1. block diagram

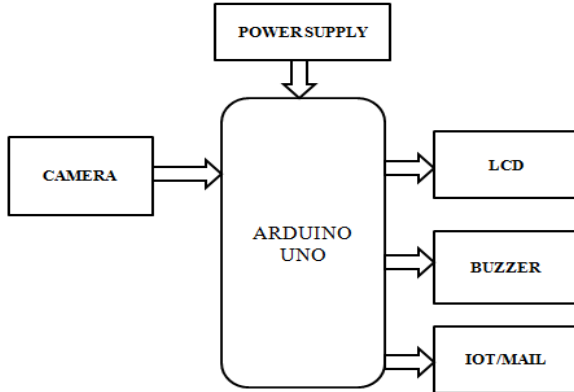


Fig 2. block diagram

**3.1 PROPOSED PROCESS EXPLANATION
POWER SUPPLY UNIT**

The air conditioner voltage, commonly 220V rms, is associated with a transformer, which steps that air conditioner voltage down to the level of the ideal dc yield. A diode rectifier then, at that point, gives a full-wave amended voltage that is at first separated by a basic capacitor channel to deliver a dc voltage. This subsequent dc voltage typically has some wave or ac voltage variety

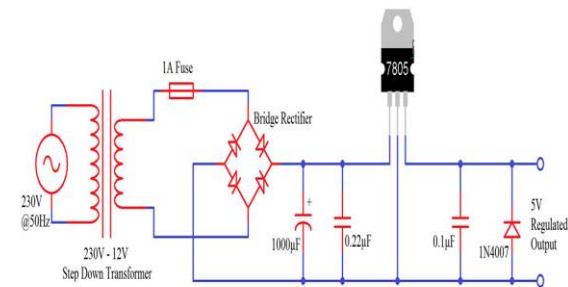


Fig 2 Power supply Block diagram

A controller circuit eliminates the waves and furthermore continues as before dc esteem regardless of whether the information dc voltage fluctuates, or the heap associated with the result dc voltage changes. This voltage guideline is generally acquired utilizing one of the famous voltage controller IC units.

SURVEILLANCE CAMERA

Surveillance camera are video cameras used for the purpose of observing an area. They are often connected to a recording device or IP network, and may be watched by a security guard or law enforcement officer. The primary purpose of installing surveillance cameras is to act as deterrence to robbers, criminals, petty thieves and

unscrupulous elements from indulging in theft, illicit and criminal activities. The most important reason for choosing a video surveillance system for your school is to keep students and faculty safe. Preventing access, reacting to problems, and improving the reaction time of the authorities adds up to safer schools and happier parents.



LCD DISPLAY

A fluid precious stone showcase or LCD draws its definition from its name itself. It is a blend of two conditions of issue, the strong and the fluid. LCD utilizes a fluid gem to deliver an apparent picture. Fluid gem shows are super-slim innovation show screens that are by and large utilized in PC, TVs, PDAs, and convenient computer games. LCD's advancements permit presentations to be a lot more slender when contrasted with a cathode beam tube (CRT) innovation. Fluid precious stone showcase is made out of a few layers which incorporate two spellbound board channels and terminals. LCD innovation is utilized for showing the picture in a journal or a few other electronic gadgets like scaled down PCs. Light is projected from a focal point on a layer of fluid gem. This mix of shaded light with the dark scale picture of the precious stone (shaped as electric flow courses through the gem) frames the hued picture. This picture is then shown on the screen.

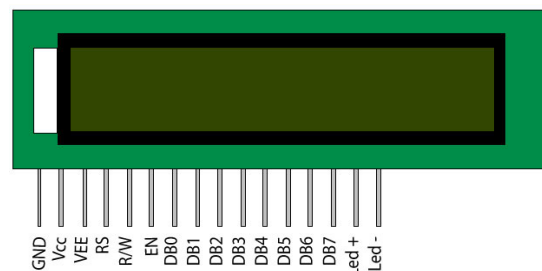


Fig. 3. LCD DISPLAY

BUZZER

A buzzer is in the mechanical form of a small rectangular or cylindrical housing, with electrical connection for direct mounting on rigid printed circuit, or with electrical connection consisting of flexible electrical son. In the latter case, the buzzer has two small brackets. The loudness of such a component is about 85 dB / cm (note that it does not specify the sound level meter - as for HP, as a business perspective, it would seem probably too little power. As for sweets which are given the price per 100g and not for one kilogram).



It requires a DC voltage to operate, it should generally be between 3 V and 28 V, depending on the model. A buzzer designed to operate at 6 V generally works very well for any supply voltage between 4 V and 8 V, and a buzzer designed to operate at 12 V can work perfectly at a voltage between 6 V and 28 V (see characteristics given by the manufacturer for not making stupidity). There are also buzzers that work directly on the AC mains 230 V. This type of buzzer is convenient to use, because unlike piezoelectric buzzers simple (simple piezoelectric transducers without associated electronics), it has no work, except of course the eventual control stage which will enable it. He provides a simple DC voltage and presto, it sounds.

IOT / MAIL

Email was designed to emulate traditional mail, and it is frequently used in this manner. Since email is delivered almost instantaneously, it allows people to communicate far faster than they could by mail, and, unlike phone calls, it allows recipients to respond at their leisure. Email is also cheap to send, and companies with large customer bases can save a considerable amount of money by sending email instead of regular letters.

The advent of popular social media, however, has made email less popular among younger people. Instead of sending short emails to each other, many are now sending short text messages or using messaging clients provided by Facebook or other popular platforms. However, this does not mean that email is likely to be replaced any time soon. More people around the world use email than social media platforms, and businesses are unlikely to turn to proprietary messaging platforms to replace it. In addition, companies can run their own email servers, allowing them to better archive messages and automatically filter messages that arrive.

FEATURE EXTRACTION:

Statistics is the study of the collection, organization, analysis, and interpretation of data. It deals with all aspects of this, including the planning of data collection in terms of the design of surveys and experiments. This is the meaning of statistics. Statistical feature of image contains • Mean • Variance • Skewness • Standard deviation

Texture Analysis Using the Gray-Level Co-Occurrence Matrix (GLCM). A statistical method of examining texture that considers the spatial relationship of pixels is the gray-level co-occurrence matrix (GLCM), also known as the gray-level spatial dependence matrix .

CLASSIFICATION

In order to classify a set of data into different classes or categories, the relationship between the data and the classes into which they are classified must be well understood. To achieve this by computer, the computer must

be trained ♦ Training is key to the success of classification Classification techniques were originally developed Features are attributes of the data elements based on which the elements are assigned to various classes. 1).The image classifier performs the role of a discriminant - discriminates one class against others. 2).Discriminant value highest for one class, lower for other classes (multiclass) 3).Discriminant value positive for one class, negative for another class (two class).

EXISTING SYSTEM

The existing system used for the recognition of the animals, it include segmentation and object detection process using Fourier transform. In this existing system Surveillance camera only fixed inside of the forest. It will record video every day. Before that sensor based demo projects student finished. They connected ultrasonic sensor in filed. It will detect object in front of animal. But it is not possible to real time.

CONCLUSION

Such a modeling enables the establishment of a comprehensive disaster prevention plan related to wild animal damage such as central and local government managers and public institutions through the use of big data, and a preemptive response system to the damage disaster through the analysis of risk factors for the haunting of wild animals. In addition, the implementation of the IoT harmful animal blocking system can improve the eradication rate of harmful animals, reduce system introduction costs, and reduce maintenance costs, and it is expected that there will be an effect of preventing damage to crops by controlling the number of wild animals. Tests using this equipment will be conducted later.

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