IOT Based Animal Detector With Alert System

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***Abstract*— Imaging and IoT sensor monitoring network technologies have taken sensor development to a completely different level. Conflicts between humans and animals in agricultural and forest areas have become a serious problem, threatening people's lives and causing many economic losses. To solve this problem, animal alarms can be used with wireless sensors and send automatic pictorial alerts to landowners as well as forest workers. This allows for early notifications in accordance with the entry type. The sensors will detect animal movement, the camera will capture the image, the image processing machine will share the captured image by the microcontroller, and then the GSM module will send the notification message to the valley forest or land owner. This research is used to understand various steps, tools, and experimental setups to save human lives from invasive species.**

***Keywords*—Raspberry PI, USB Camera, Relay, Alarm system, Python Software, GSM module.**

I. INTRODUCTION

In recent years, the integration of Internet of Things (IoT) technology has led to changes in many fields, including wildlife conservation. In this context, our work introduces an alarming, IoT-based animal detector designed to monitor and control disturbances of wild animals. The image recognition problem is a complex and difficult problem that involves many parameters such as lighting, orientation, expression and animal size. In this project we will present an independent study and present some advantages and disadvantages of PCA (Principal Component Analysis) when used for image recognition. In recent years, a new vision-based image recognition method has been developed. The above technique is one of the most popular photo recognition techniques. Animals are identified by groups; that is, each group represents a specific animal. There are 5 groups in total here (Leopard and others). We applied PCA to both groups, creating 5 cases with 20 images per group.

II.LITERATURE REVIEW

Amol Jayant Kale and R.C.Mahajan [1] have proposed a methodology for street sign acknowledgment framework which getting the traffic sign image from the moving vehicle. In this paper the framework gets separated into two phases. The primary stage is utilized as an identification part which recognizes the street sign coordinated with the database and second part is arrangement organize that is to characterize the distinguished signs which is taken from the principal arrange. Every one of the images are put away in database. In the identification arrange, the info picture taken is a YCBCR shading space distinguishes the street signs by utilizing shape separating technique. At last, the arrangement module decides the scene pictures which is identified by utilizing an Artificial Neural Network (ANN). The recreation appeared in this framework creates a steady extraction of scene image for the location of the signal.

Filatov et al [2] have proposed a methodology for discovery and acknowledgment of traffic signs explicitly planned for brightening and separation changes. In this paper, the framework utilizes a single board PC Raspberry Pi 2 and web camera 150 for playing out the proposed method. An algorithm for deciding the traffic sign area utilizes shading channel with morphological administrators and canny edge indicator. The identification of image type depends on multilayer perceptron neural system. The framework takes five image databases to prepare and test a calculation. The created framework gives vigorous to light changes and impacts. It can identify street signs around 20 cm in breadth from 1.5– 2 m separate. The hindrance of this system is that the achieved exactness and processing speed of the planned operation are less when handled with neural system.

Ayoub Ellahyani and Mohamed El Ansari [3] have proposed a framework with vehicle mounted cameras to distinguish street signs while vehicle driving out and about. The frameworks essential capacity is to educate the driver of caught street signs that may missed because of diversion or inattentiveness. In this work, a strategy for street sign discovery and acknowledgment is found. This strategy is isolated into three phases, the initial, a color segmentation

technique is utilized to separate the ROI of scene image. At that point, the image is alluded to polygonal estimation procedure to recognize triangular, circular and rectangular shapes. The last stage utilizes SVM classifier to perceiving the recognized signs taken from planned component. This methodology was tried on two openly accessible datasets. The kernel models in classifier are very delicate to over-fitting the model foundation selection and furthermore restrains in speed and size.

Kumar et al [4] have proposed the improvement of traffic framework controller in a street intersection utilizing microcontroller. The strategies utilized in this framework endeavors to diminish the event of clog caused by traffic lights. The fundamental controlling unit is Raspberry Pi. The proposed framework utilizes the IR transmitter and IR collector which are settled at the required heading out and about. The raspberry pi controller chooses and controls the traffic flag time on each vehicle rely out and about. Furthermore, the quantity of vehicle check taken from the controller is recorded. At last to get the right grouping of traffic flag, the recorded subtleties are been put away to Raspberry Pi controller by educating the PC that it will send right deferral of flag through LED lights. The proposed philosophy utilizes the Color changer time mini-computer Algorithm for location. On account of utilizing IR sensor in this framework, the thickness of vehicles can't be determined creating more aggravations and commotion.

Fang et al [5] have designed a way to deal with identifying and tracking street signs showing up in complex rush hour gridlock signs. The discovery stage comprises of two neural system frameworks are produced to remove shading and shape of road sign image. Based on the extracted image, the street signs are situated at specific moment. This procedure is basically conceptualized regarding fluffy set order. In traffic stage, the street signs coordinated with the database that is followed already through picture arrangement utilizing Kalman channel. The simulation results acquired demonstrates that the execution in both location and tracking of street signs present in complex scenes and various climatic condition.

Figure 1. Picture of various Animal

III. PROPOSED METHODOLOGY

In this paper, we propose a method to identify animals using visual images so that people in the area can be alerted to the presence of dangerous animals. To inform the authorities, we selected five animals and used the PCA algorithm and eigenface method to identify the animals.

Thus, people who want peace can live without fear of attacks by wild animals. Since there are already many cameras, all we need to do to detect animals is to use software. Animal detection using face detection method A method combining detection and tracking of animal faces using Haar-like features and Ad boost classifiers for the study of wild animal movement. The system is activated only when the target animal is detected, in order to extend battery life and ensure that the recorded images are scientifically useful. This method is especially important in cases where the photographer is not available at the location for security reasons or the photographer may scare some animals. The face detection method uses the area difference of different light sources to detect the image area of the animal's face, so that the animal's face is measured.

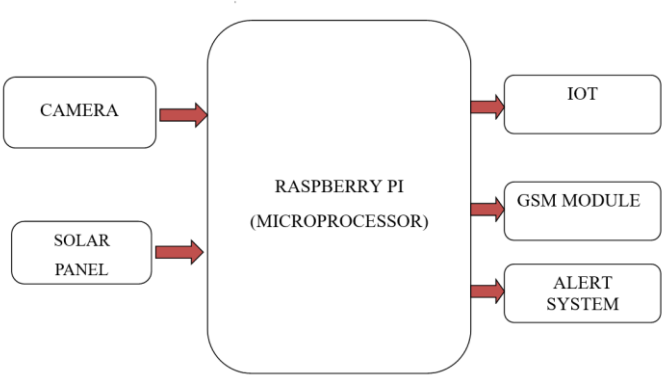

Figure 2. Block diagram of our proposed model

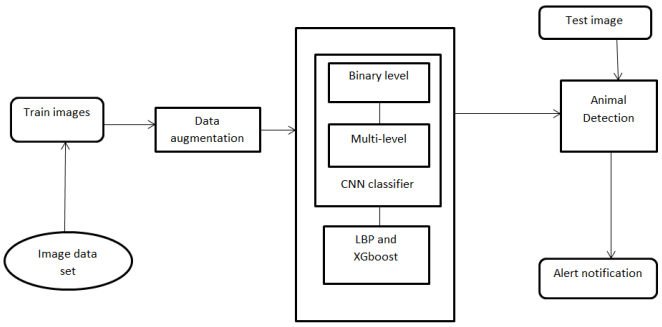

Figure 3. Block diagram of our proposed system

A. Raspberry Pi

Raspberry Pi manufactures our board configuration through licensing agreements with Newark element14 (Premier Farnell), RS Components and Ego man. These companies sell Raspberry Pi online. Ego Man made a version released only in China and Taiwan, distinguishable from other Pis by its red color and lack of FCC/CE marking. The hardware is the same for all manufacturers. (Model B and Model B+) Up to 512 MB. It doesn't include an internal hard drive or solid-state storage, but uses an SD card for booting and storage; Model B+ uses MicroSD. The Foundation offers Debian and Arch Linux ARM distributions for download. Tools are available for Python (in the RISC OS image or Brandy Basic clone on Linux), C, Java, and Perl as native languages.

B. Web Camera

A network camera is a camera that sends images directly to a computer or computer network, usually via USB, Ethernet, or Wi-Fi. Webcams get their name from their widespread use in World Wide Web cameras. Other popular uses include security surveillance, computer vision, video streaming and social media recording.

Network cameras are known for their low manufacturing cos \ts and flexibility, making them the lowest cost of video telephony service. Because some network cameras can be remotely activated by spyware, they also become a source of security and privacy concerns.

C. Speaker

A loudspeaker (or "speaker") is an electroacoustic transducer that converts an electrical signal into sound. The speaker movements according with the variations of an electrical signal and causes sound waves to propagate thru a medium which includes air or water. After the acoustics of the listening space, loudspeakers (and other electroacoustic transducers) are the maximum variable elements in a current audio device and are generally accountable for maximum distortion and audible differences when evaluating sound structures.

D. GSM

GSM (Global System for Telecommunications: originally from Groupe Special Mobile) is the world's most popular mobile phone standard. The GSM Association, a trade group that supports mobile phone users and manufacturers, estimates that 80% of the world's mobile market uses this standard. GSM is used by more than 1.5 billion people [2] in more than 212 countries and regions. Its ubiquity allows mobile network operators to arrange global roaming, allowing users to use their phones in different parts of the world. GSM differs from its previous technology in that the signal and voice channels are digital, therefore GSM is considered the second generation (2G) mobile phone. This also facilitates the widespread use of data communication in the system.

I. Python Software

Python is an interpreted, high-level general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python was designed with an emphasis on readable code, especially when using a lot of free space. It offers models that clarify the work of everyone, both small and large. In July 2018, Van Rossum resigned as president of the language society. It supports many functions, including object orientation, values, functions, and methods, and has a large and efficient library. Python, an implementation of Python, is open source software [30] and, like almost all other implementations of Python, has a community development model.

Python and Python are managed by the nonprofit Python Software Foundation. Python is a versatile programming language. It supports project-oriented programming and workflows, and many of its features support functionality and efficiency (e.g., through metaprogramming and meta-objects (magic)). Many other sessions are supported by extensions, including contract creation and logic operations. Includes Filter(), Map(), and Reduce() functions;

list understandings, dictionaries, and sets; The model library includes two modules (intercools and functions) that use functional tools derived from Haskell and Standard ML.

IV. Result

EXISTING METHOD AND PROPOSED METHOD

S.no	Existing Method	Proposed Method
1	Using acoustic sensors or microphones to detect animal sounds, such as bird calls or predator cries.	Choose appropriate sensors to detect the presence of animals. Image recognition cameras.
2	Installing passive infrared (PIR) sensors to detect the heat signature of animals. When an animal passes in front of the sensor, it triggers an alert or activates deterrent devices.	Select IoT hardware such as microcontrollers Raspberry pi. Connect the chosen sensors to the IoT hardware. For image recognition.
3	Integrating animal tracking devices on livestock to monitor their movements and behavior of the Animal.	In the case of image recognition, set up the cameras to capture images of the Animal.
4	It can detect the animal and only send notification to the crop land owners.	The data collected from the sensors are processed to determine the presence of animals and send notification and give Alert to the crop land owners.
5	Components used in existing method Sensors, Communication Module, Power Source, Data Processing, Alerting System.	Components used in Proposed method Camera and Image Sensors, Data Transmission, Microcontroller raspberry pi, Animal Detection Algorithms, Alerting System.

V. Conclusion

In end, the development of an IoT-primarily based animal detector with an alert device marks a huge advancement in flora and fauna conservation. This concept of defensive plants is simple to implement and can be applied without causing harm to any animals or humans. as a consequence, this product may be used to guard crops inside the farm. It is probably very useful for agricultural functions as opposed to conventional techniques used nowadays. Farmers can acquire actual-time statistics on the vicinity and behavior in their animals, allowing for faster reaction to any anomalies or emergencies.

This no longer best reduces the threat of livestock theft however also enables in finding misplaced or wandering animals, saving time and assets.

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REFERENCES

1. Amol Jayant Kale and R.C.Mahajan **:** YCBCR color & shape filtering for detection, ANN for classification. Filatov et al.Raspberry Pi 2 with web camera, color filtering, morphological operations for sign localization,robust to lighting changes but slower due to NN usage. e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765. Volume 10, Issue 4, April 2021

2. Filatov et al : Proposed a traffic sign recognition system using Raspberry Pi 2 and a web camera, robust to lighting changes. It employs color filtering, morphological operators, and a neural network for classification, but suffers from reduced accuracy and processing speed due to neural network usage. ISSN: 2366-1313. Volume IV issue 2 Aug 2019.

3. Ayoub Ellahyani and Mohamed El Ansari: Ellahyani and El Ansari proposed a vehicle-mounted camera framework for real-time street sign detection.While effective, limitations include sensitivity to overfitting and constraints in speed and size. e-ISSN: 2395-0056.Volume 7 Issue 1 Jan 2020.

4. Kumar et al: Proposed a traffic system controller for intersection management using a Raspberry Pi microcontroller. However, limitations include the inability to measure vehicle density accurately due to IR sensor usage, leading to potential disturbances and noise. ISSN: 2455-2631. Volume 4 Issue 3 Mar 2019.

5. Fang et al: Developed a method for detecting and tracking street signs in complex traffic scenes using neural networks. Their approach includes two neural networks for color and shape extraction, followed by positioning using fuzzy set theory. ISSN: 2366-1313. Volume IV Aug 2019 Issue 2.

6. M. S. Farooq, S. Riaz, A. Abid, K. Abid, and M. A. Naeem, ‘‘A survey on the role of IoT in agriculture for the implementation of smart farming,’’ IEEE Access, vol. 7, pp. 156237–156271, 2019.

7. M. O. Ojo, S. Giordano, G. Procissi, and I. N. Seitanidis, ‘‘A review of low-end, middle-end, and high-end IoT devices,’’ IEEE Access, vol. 6, pp. 70528–70554, 2018.

8. G. S. Veena, D. Sneha, D. Basavaraju and T. Tanvi, "Effective Analysis and Diagnosis of Liver Disorder", ICCSP, Chennai, 2018, Pp: 0086-0090.