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Peacock Monitoring and Repellent System for Agriculture

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ABSTRACT

Deforestation and environmental changes creates a conflict between human and animals. In present situation the natural resources are severely depleted, which makes animals to enter human living area and agricultural field. This conflict between human and animals put human life in danger. So, it is necessary to monitor the agricultural field continuously inorder to prevent the entry of animals. In our proposed paper, motion of an animal is detected by using PIR sensors and drone attached with camera is triggered to take an image of the intruder. This image is used to classify the kind of intruder by image processing. The location, type of danger intruded is sent as an SMS to the field owner and also to the forest officials as an alert message using GSM technology. If the intruder is peacock, repellent techniques such as irritating noise in the range of ultrasonic frequencies and turning on the bright light are used to repel. The image of animal is not matched, alert message and repel techniques are not executed.

KEY WORDS:

INTRODUCTION

Farmers prefers electric fence as one of the option to prevent the entry of the animals into their agricultural field. Whenever animals touch the electric fences it leads to electrocution. Due to electric shock the intruder life will lost and in certain cases, life of human will also be lost.In order to avoid the death of intruder and humans due to electric fence, we have developed an idea to repel the peacock from the agricultural field without hurting the intruder. In this proposed work, we have developed a drone attached with camera to take the images of the intruder and the image is processed using image processing and suitable repellent techniques will be adopted to repel.

MATERIALS AND METHODS

Improved real time image detection system is used to capture the images continuously in the border areas and it was transmitted through RF network to the base station, later the images are decomposed and extracted to check the obtained image to that of the database image. Here image vision algorithms are used to find the animal (Sugumar et al. 2014, Santhiya et al. 2018). A concept is proposed in paper to classify the intruder by using support vector machine (SVM). Here sensor is used in a spatial resolution capability platform to collect the data of the moving animal and software's such asblender and OpenGL software are used to generate the animal intrusion data to examine and to classify the animal (Upadrashta et al. 2015, Xiaohan Liu et al. 2015)

As we know, we normally set-up fence for agricultural field to prevent the entry of wild animal's which is prohibited. In some cases, we set-up electric fence to avoid the entry of animals which results in loss of animal lives. Beehives are placed along the border and due to this, animals fear of bee stings and sounds and leave the place when sound of bees is heard (Sheela et al. 2016, Srinivasa Reddy Gudibandi et al. 2015) In the available system, towers are constructed to place the PIR sensors to monitor the animal's movement and humans are needed to monitor it regularly.

i) Significance of the system

To avoid the conflict between the intruder and farmers in the field from accident. Safe and efficient operation is ensured. The Presence of operator in the area is not necessary. Wide range of survey is possible.

RESULT AND DISCUSSION

PROPOSED ASSISTIVE SYSTEM

In this paper, drone with camera, GPS, GSM which are interfaced with a microcontroller through phone is used. GPS is used to navigate the drone in the required path. GSM is used to transfer the image taken by the camera to server through internet for image processing. After identifying the intrusion ultrasonic sound wave of frequency 4 KHz is generated to chase-off the peacock. A microcontroller in interfaced with the mobile phone through Bluetooth link. A PIR sensor and the transducer are connected to the microcontroller. The application running in the mobile phone sends the co-ordinates to the microcontroller and captures the image with the in-built camera which is sent to the server through internet for image processing. The schematic diagram for the proposed system is shown in Figure 1.

Figure 2 shows the circuit diagram to operate the drone. Here PIC microcontroller is used to do the necessary control actions of the drone.
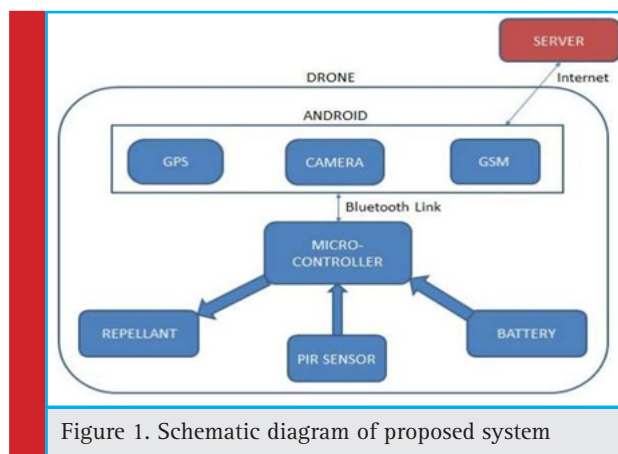
Figure 1. Schematic diagram of proposed system
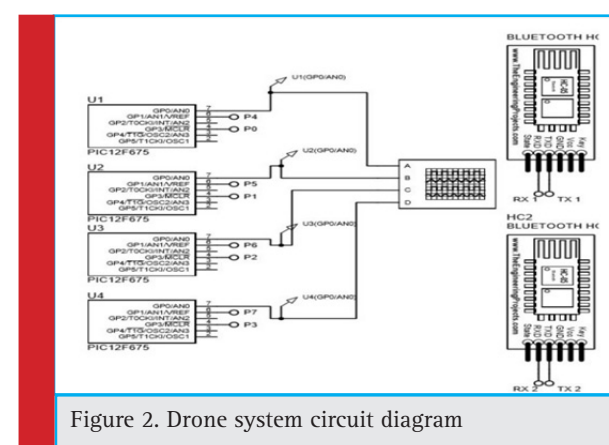
Figure 2. Drone system circuit diagram

Figure 3 represents the circuit diagram for detecting intruder and repels system. PIR sensor is used to detect the intruder and ultrasonic transducers are used to generate the ultrasonic waves to repel the intruder.

EXPERIMENTAL SETUP

The drone is in surveillance, when any intrusion (Movement) can be sensed using PIR sensor and image is captured using camera. The captured image is sent to server by use of internet. By make use of image the server identifies what kind of intruder is. After identifying the intruder ultrasound waves are generated to chase-off the intruder (Peacock). PIC Microcontroller is used to control the quadcopter by seamlessly getting the coordinates from the android mobile gyroscope with an update rate of 5ms. Then a suitable algorithm is used to keep the drone in balanced condition for surveillance by adjusting the PWM pulse given to ESC which varies the thrust of each motor accordingly. The PIR Sensor triggers the input pin of the MC when a living thing comes into its field of view. The MC sends a command to android application through Bluetooth to capture the image of the intruder from the camera. Then the application sends the image to the image processing server through internet with the help of inter-

Figure 3. Circuit Diagram for intruder detection and repellent system

Figure 4. Drone hardware setup

nal GSM modem and waits for the response information which contains the kind of intruder. The Microcontroller generates ultrasonic sound waves using SR-04 transmitter at 4KHZ. 20 Here four PIC12F675 Microcontrollers are used as slave to generate suitable PWM signal based on the command of the master then it is given to the ESC's of the motors. The android application serves the location details to the MC through Bluetooth which is used for navigating the drone. Bluetooth is used for establishing the communication between MC and Android Mobile at a speed of 115200 Baud (bits/sec) which makes us easier to communicate. Android application was developed by Android Studio.

CONCLUSION

The proposed project peacock monitoring and repellent system was designed and implemented as prototype. Through the proposed system surveying land area can be increased and effective surveillance is achieved. Surveying time can be increased by increasing the power backup. This method does not affect the environment and bird's life. Thus, increases crop productivity.

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