DATE	21 Nov 2022
TEAM ID	PNT2022TMID14780
PROJECT NAME	IoT Based Smart Crop Protection System For Agriculture
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IoT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE :

ABSTRACT:

Animals like wild boars, buffaloes, cows, elephant, monkeys, birds, etc. damages the crop a lot which results in loss of production and so of farmer.

It is very difficult for a farmer to keep an eye on the field every time. This system is designed to surveillance the field 24*7 which is not possible for a human being and diverts the animals without harming them.

The system uses raspberry pi, PIR sensor to detect animal, camera module to look on animal, GSM module to send alert message to farmer, and a buzzer to divert the animals. This system ensures the safety of farm and decreases the loss of farmers.

In this we have used raspberry pi which is main heart of the system. This project is helpful for the farmers and because of this system farmers are not required to stay on field 24 hours and guard it.

We have used PIR sensor for motion detection. After processing if motion is detected, camera will be automatically turned on and command will be sent to capture the image.

Captured image will be processed with the help of OpenCV to check if the motion was due to animal interference or human interference. If it is due to animal interference, sound will be produced by buzzer to scare away that animal, and an alert email containing that image will be sent to the farmer.

Flashlight will be used during the night time to capture better image and to simulate the presence of human during the night time. If the motion detection is due to human being then the system continues to sense the motion.

Software development of the system is done using Python. Whenever motion is detected, program will capture the image using Raspberrypi Camera.

Image captured by the camera will be processed to differentiate between Human and Animal OpenCV library is used along with COCO dataset. OpenCV (Open Source Computer Vision Library is an open source computer vision and machine learning software library.

The MS COCO dataset is a large detection , segmentation, and captioning dataset published by Microsoft. Understanding visual scenes is a primary goal of computer vision;

It involves recognizing what objects are present, localizing the objects in 2D and 3D, determining the object's attributes, and characterizing the relationship between objects.

Therefore, algorithms for object detection and object classification can be trained using COCO dataset.

If the captured image is of Animal then buzzer will be turned on in the farm to scare the animals and an alert email will be sent to the farmer along with captured image for the verification.

If Human presence is detected then the program will continue to detect the motion.

In India many times farmers face huge loss just because of animals. Hence, to overcome this issue , the designed system produces the sound to scare the animals , so that animals will automatically ran away.

The main aim is to prevent the loss of crops and to protect the area from intruders and wild animals which poses a major threat to the agriculture areas.

The GSM module is used to make a call to the farmer to alert him. Therefore , the designed system is affordable and useful to the farmers. The designed system won't be harmful to animals and persons and it protects the farm areas. The system is capable to protect the farm in day and night with Iot monitoring.