

## **Ideation Phase Literature Survey**

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# **IoT Based Smart Crop Protection System for Agriculture**

### **Abstract:**

Most of the farmers are facing many problems nowadays due to many reasons. Our problem to solve is the invasion of various species such as birds and animals that harm the crops that are being cultivated. Various types of species such as birds and animals come to the cultivation field according to the crop that is being cultivated and also according to the season of cultivation. Some wild animals enter the field during night times when the field is near a forest region or when the farm cultivates some fruits and other crops that attract animals. Some animals cross the field in search of food and water and also the birds enter the field for food and they damage all the crops. When the animals enter the field they not only eat food but they also damage the entire field by walking upon the crops and also by spoiling the food crops. The birds, by entering the field they come to eat seeds of the crops and also they tend to drag the crops and ruin the entire field. Some birds enter the field to eat the insects and pests in the field.

Here to solve this situation we are proposing a solution using IOT(Internet of Things) where we use various types of sensors to monitor the entire field and using the help of the internet we tend to send the message to the farmer or the person who is responsible for solving the crisis that is currently occurring. The types of sensors we use will also give the information of the humidity level in the field, the temperature of the field, and detection of animals using their thermal radiation and also we process the information and give them in the form of graphs and images to the farmers for easy understanding.

### **Design Methodology:**

The most important factors needed are Internet, Arduino UNO, sensors such as temperature sensor, humidity sensor, uv sensor, uv cameras for image processing, wi-fi module, GSM module, PIR sensor, motion detector and a smartphone that is connected to the internet and the Arduino. All the sensors are connected

to the Arduino and are placed at its specific coverage distances. The temperature and humidity levels are monitored and graphs are updated every 1 hour. If the humidity level and temperature increases or decreases from its normal level an intimation is sent in the form of message and mail to the connected smartphone. The graphs of these are stored in the cloud for future references. The PIR sensor and UV sensors detect the motion of animals and birds for a particular range. The thermal radiation temperature of humans at different ages is fed to the system so there won't be any false alarm. If any invasion of animals is found, the uv camera focuses on the region and the processed image is sent to the farmer . After seeing the image of the animal that entered, they can decide to take any actions. A fence is built around the field to prevent large animals from entering where the sensors are placed at all the corners of the field fully covering the entire region.

## **Implementation:**

Firstly, we should create codes for connecting the sensors to the Arduino and connecting the Arrduino to the Wifi module and connecting them to the Internet.

Then we should create codes to monitor and intimate messages about humidity and temperature on a regular basis, and codes should be written for PIR sensor and UV sensor to make sure that the motion detection of animals is being intimidated and preventive measures are taken.

The preventive measure for every problem should be given according to the problem that arose and the codes for every problem and their solution should be fed on the cloud to access and as a result if the person doesn't know what to do in this type of situation then they can refer to the solutions.

Codes should be written to not to intimate humans and also there should be power backup for the system to function efficiently. The backup system is solar and all the products used should consume less power and function more efficiently. The system should be made in a way that it can function more effectively even when there is very low data rate. The program should be coded in such a way.

## **Conclusion:**

AS a result of this system, we can detect the changes in the field easily and intimate the farmers about it and also we can take precautions and do remedies accordingly. Here we use very low power consuming highly efficient components that give us accurate results and also they perform at low data rate conditions without any lag and help in finding the remedies. This crop protection system helps in detection of all kinds of external dangers and it saves time and money to the farmers before any loss that may occur. With the help of this system the farmers can be in a peaceful environment at ease without any pressure.

