IoT Based Smart Crop Protection System For Agriculture

Project Objectives:

The main aim of our project is to protect the crops from damage caused by animal as well as divert the animal without any harm. Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds etc. This leads to huge losses for the farmers. It is not possible for farmers to barricade entire fields or stay on field 24 hours and guard it. So here we propose automatic crop protection system from animals.

IoT-based agriculture system helps the farmer in monitoring different parameters of his field like soil moisture, Temperature, humidity using some sensors. Farmers can monitor all the sensor parameters by using a web or mobile application even if the farmer is not near his field. Watering the crop is one of the important tasks for the farmers. They can make the decision whether to water the crop or postpone it by monitoring the sensor parameters and control the motor pumps from the mobile application itself. All the sensor parameters are stored in the IBM Cloudant DB.

Project Flow:

1. The device will detect the animals and birds using the Clarifai service
2. If any animal or bird is detected the image will be captured and stored in the IBM Cloud object storage.
3. It also generates an alarm and avoid animals from destroying the crop
4. The image URL will be stored in the IBM Cloudant DB service
5. The device will also monitor the soil moisture levels, temperature, and humidity values and send them to the IBM IoT Platform
6. The image will be retrieved from Object storage and displayed in the web application.
7. A web application is developed to visualize the soil moisture, temperature, and humidity values
8. Users can also control the motors through web applications.

To develop this project successfully we have to complete all the tasks as given bellow:

a. Create and configure IBM Cloud Services
b. Create IBM Watson IoT Platform
c. Create a device & configure the IBM IoT Platform
d. Create Node-RED service
e. Create a database in Cloudant DB to store location data
f. Create a cloud object storage service and create a bucket to store the images

- Develop a python script to publish the sensor parameters like Temperature, Humidity, and Soil Moisture to the IBM IoT platform and detect the animals and birds in video streaming using Clarifai.
- Develop a web Application using Node-RED Service.
- Display the image in the Node-RED web UI and also display the temperature, humidity, and soil moisture levels. Integrate the buttons in the UI to control the Motors.

By the end of this project you will:

- Gain knowledge of Watson IoT Platform.
- Connecting IoT devices to the Watson IoT platform and exchanging the sensor data.
- Gain knowledge on Cloudant DB
- Gain Knowledge on using the Clarifai service
- Gain knowledge of storing images in IBM Object Storage and retrieving images
- Creating a Web Application through which the user interacts with the device.