Smart Farm Website and store data using cloud

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***Abstract*—In our daily life husbandry sector is a very important role. In pandemics also husbandry sector has a useful role in our life. The husbandry sector and farm industries recently have a large number of developments of IoT worldwide. In a smart farm, real-time data is required for preventing water management and healthy crop cultivation. All these things are not possible for farmers to predict so our system will help to predict the weather predictions. Farmers are not able to control the farm activities outside the farm at that time our website and cloud are helping to see the real-time data. First, we sense the data in the environment then stored the data in the cloud and webpage, and last we analyze the data in each and every small area. on our webpage, we store data so the data loss is less.**

Keywords—Smart farm, Sensors, webpage.

I. Introduction

Husbandry help to grow the world's economies. India is a very large amount of population so food is a very basic need for human beings and nowadays people find a shortcut way. In the pandemic also we all are seeing Husbandry sector is very important. So in the Husbandry sector development is very important. Sometimes whether are changing and vary drastically so the farmers are not able to protect the crop in very less time. farmer is also normal human so they need a real-time data monitoring system. Plants and crop cultivation needs proper weather, Some plants need cloudy weather but other plants harm the cloudy weather so that's why proper monitoring is very useful. (1)In our nation 12% of our land is used in the Husbandry sector.FAO predicts that in 2050 the population reaches 9.3 billion, Before reaching this population we develop new technology in the Husbandry sector then we are not facing any problems otherwise we are facing so many problems. nowadays we see that food is not coming natural all are hybrid and some time food is quite available naturally but in that large amount of pesticides, that's why we facing diseases compare to old people. (2)soil is also infertile because due to lack of knowledge, farmers sprayed a large number of pesticides on crops. The Farmer does not know the real-time weather and proper soil prediction so they are wasting water, in the farm every 10m the soil is different so the water level is also different in every part of the farm.(3) agriculture needs technology in a modern way to implement new farming sectors and easy to grown-up. In every 10m, the soil moisture is different, and soil texture is also very different so the real-time data is very important. The best way to overcome these problems is to develop the farming sector using IoT so that data is stored virtually so that we are easily tracking the data. All these things are not possible to predict in normal human beings(Farmers) So the sensors are used to predict the weather monitoring in real-time and the data are stored in a cloud and webpage. (3)IoT is helping to find the live Parameters using the sensors so the live monitoring will be done. The productivity of resources will help the farmers to use the live factors. By using our Website farmers easily find the climate parameters and use things-speak visual representation of data.

Hardware designing & Methods

Hardware model: If the farm is very large at that time one hardware is not sufficient so We will establish more than one device. The agriculture field is supposed 100 acres we divided it into 10 acres each and we put our model on every 10 acres of land so that we find accurate data on that farm. (1)Using the sensors we find accurate parameters in every section of the land so a healthy and smart farm is established. In each model, some sensors are included the first one is DHT-11 for using temperature and humidity to measure the environment in real-time data. Soil moisture content is measured using the soil moisture sensor this sensor is dielectric, and its capacitance is calculated as the permittivity. in the output of the sensor calculate the frequency response of the soil moisture content in the farm. The last one is the rain sensor they act like a variable resistance that will change the status. the land is dry then resistance is low and resistance increases when the land is wet rain sensors connect two outputs one is digital(0/1) and one is analog(0 to 1023). Rain sensors use irrigation for detecting the level of water in the soil so the wastage of water is prevented. All these sensors are placed across the farm and all the collected data of the sensor are transmitted to the raspberry pi using a wired or wireless device. The various sensors are installed in the farm all of these are controlled using raspberry pi. after that all data are displayed in the cloud (Thing-speak) using the python code and also the data are stored on the webpage.

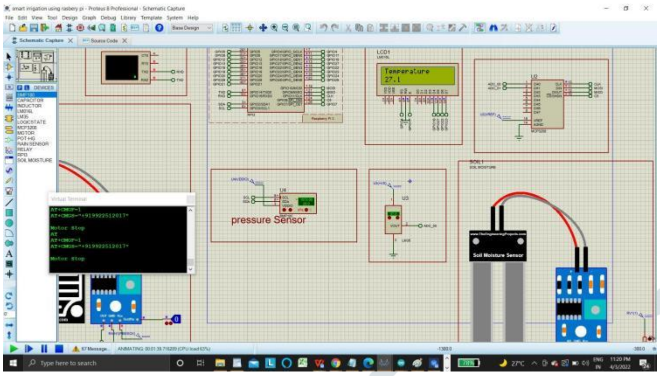

Fig1:Simulation For Sensing the data

software Design: The data are calculated using the sensors and controller in the farm now we are sending these data to display and store in the cloud using the programming (python). In the cloud(thing-speak) the data are stored using the graph and waveforms and simultaneously we are storing our data on the webpage so the data is not lost. On the webpage, the user needs to register or log in after that he will see the parameters of whether in real-time, and the user also sees the stored data in the form of a graph. So the users easily decide how much water and fertilizers are used on the farm. (2)the farmer also checked which particular area of the farm needed how much pesticides and water. On the webpage there are two modules:

1. Admin module and
2. 2. Server Module

1. Admin module: In that module user's data and login information are checked and only authorized data are allowed to log in all these things happen in the admin module. all rights are decided in that module.

2. Server module: After allowing the admin module server module starts the work and in the Server module all collected data in the farm are stored and the real-time data is updated. and these module is used to display the prediction of all parameters of the sensors and the information of the farmers.

Figure 2: Webpage UI (user login page)

Results and DISCUSSIONS:

All the work is stored in the cloud and webpage in the form of graphs In figure 3. so the farmers are easily finding the predictions of whether.

Figure3: Data in form of graphs and gadgets.

In the cloud, some alarms and graphs are stored for good visualization in figure 4.

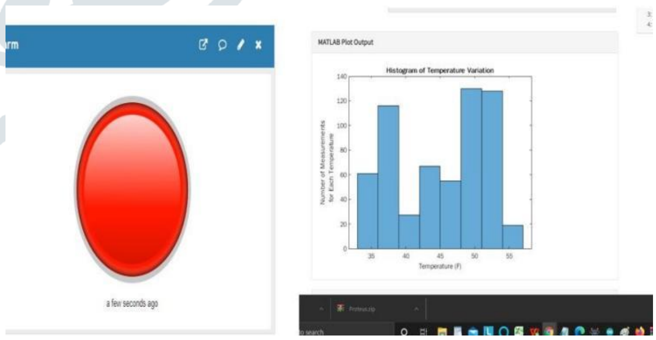

Figure 4: Alarm for increasing temperature

In the hardware module also some libraries are required:

1. GSM Library

2. Rain sensor Library

3 . Soil sensor Library

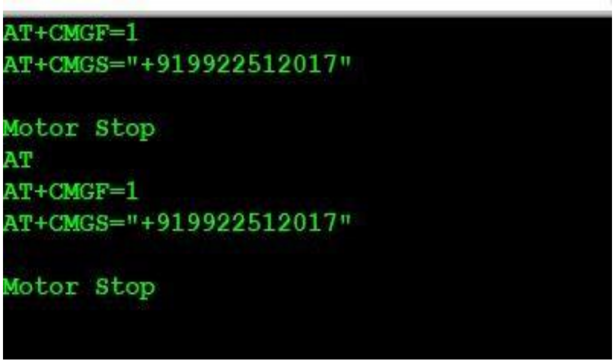

Figure 5: simulation Output

and the data of the hardware module are used to store using the python in the cloud(things speak) so first install the library of pythons like NumPy, OpenCV-python-Vision,matplotlib for the Data visualization, TensorFlow, sklearn, seaborn. after that data are exported to the cloud in the form of graphs and excel sheets so we process data in figure6.

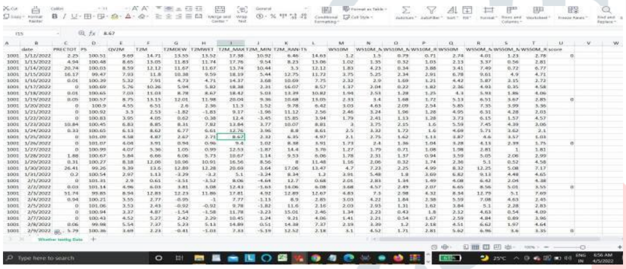

Figure 6: Data Processing.

and stored it on our webpage and analyze the data from every meter using matching learning in figure 7.

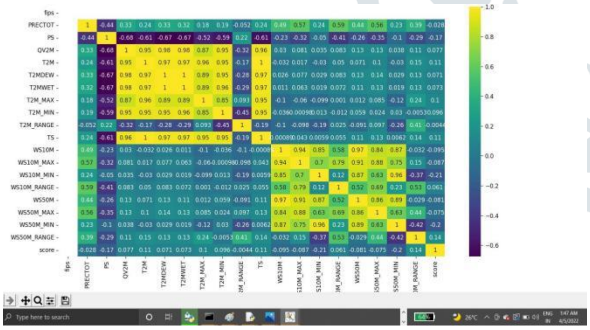

figure 7: Analyzing soil parameters data

After analyzing the data we plot the graph using the python matplotlib library. In every 10m, the dew points are different and manually difficult to find so using sensors and matching learning we find and plot it.

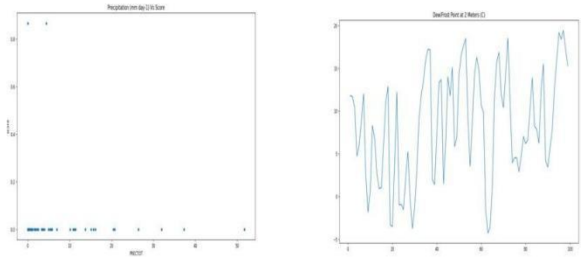

Figure 8: Precipitation In day 1 and dew points after 10m

webpage design: The webpage is designed using PHP programming in Vs code software, all data are stored in that webpage.

SYSTEM ALGORITHM:

1. Farmer Register and then log in to the system
2. Real-time find the data and simultaneously update weather conditions
3. received a request
4. Apply genetic algorithm
5. Display and store Predict forecast parameters.

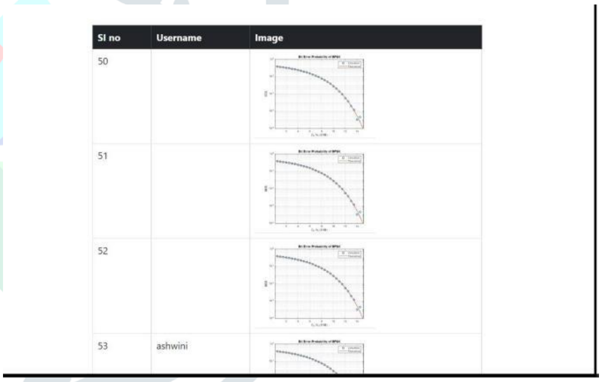

Figure 9: Webpage UI (Data Store Page)

conclusion:

In this paper, we discuss Smart farm whether parameters and stored in the cloud, webpage using matching learning, and the analysis of soil moisture data. Future weather prediction is the most important requirement because of the old and real-time data we find but the future data are useful to farmers for smart farm and crop cultivation. the data are stored using the calculated parameters in the sensors, using the rain sensor we avoid wastage of water. all data are found in any place in the world using our webpage with just one login. using the webpage and cloud (things speak) data is not lost easily.

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