Open Source Remote Triggered Weather Monitoring System

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Abstract: *Implementing a prototype model for the open source remote triggered weather system, temperature and humidity Temperature and relative humidity measurement by using the appropriate sensors are very beneficial to the industries and weather monitoring centers . A weather monitoring model or system has been developed as discussed in this project to record and displaying of the weather parameters like temperature and humidity which helps some industrial and smart home applications. various weather monitoring techniques have been reviewed in this project. Recorded information is kept in the device for system development where it helps to know the temperature of a particular location. User can find out the data saved by the system anytime as per the request. Among Various techniques and the user can view the live stream of the system where the device is installed. And the temperature can be accessed remotely from any place. Like radars, satellites, microcontrollers of weather monitoring systems, the raspberry pi is the latest& efficient wireless weather monitoring technique.*

Keywords: Raspberry Pi. Cloud Server, DHT11, Python programming, HTML JavaScript and PHP programming

I.　　Introduction

Temperature and humidity are the main parameters that are being observed in the environment for the industrial purposes and in many applications, the temperature of a every system is need to be known for the proper running of the system, and we know that the field of technology is growing and developing immensely, with growing technologies the devices we use have to be developed with inversions and technologies. To know a temperature of a particular place it might be related to a system where a human can enter and find temperature, it can be system where a temperature needs to be maintained, to help all these we are in this project proposing a prototype model which is remotely triggered an "open source remote triggered weather monitoring system using raspberry pi".

We know that now a days we can know the temperature of an any places by using satellites and it can be known in google system and we have app that installed in the phone which updates us with the change in temperatures. And that value is the temperature of the whole city. so now the question is can we know the temperature of the particular places. or a very particular small room where a heavy heating system is installed, can we know the temperature of that place in the net. now we cannot. So, we here in this project we have a prototype where we can remotely know the temperature of particular places and where the data will be stored so using that data. The temperature of a system can be monitored and it can be used for smart home applications. [1]-[7].

Raspberry pi is small credit card sized computer comes from a combination of the computer small pc size and affordable prize. It works as the sever and raspberry pi can be connected to wi-fi router and powered by BCM2835 system on a chip. Which as 256MB of RAM, it is powered by 5V USB

II. Materials and Methodology

Here in this project the raspberry pi is the processor acts as the main heart of the system, every main works that are doing is the raspberry pi. Here the raspberry pi takes the data from the dht 11 sensor and the data will be stored in a file of the raspberry pi. The raspberry pi will be a processer. the raspberry pi desktop will be having the python code where the code for data fetching from the DHT 11 sensor is included, and the python code also includes a function to call html page. once the python code will be running in the raspberry pi terminal, the raspberry pi starts fetching data from it and the data will be stored in the data base .and along with this one it starts and assign a port to the html webpage the data will be uploaded to the web page.
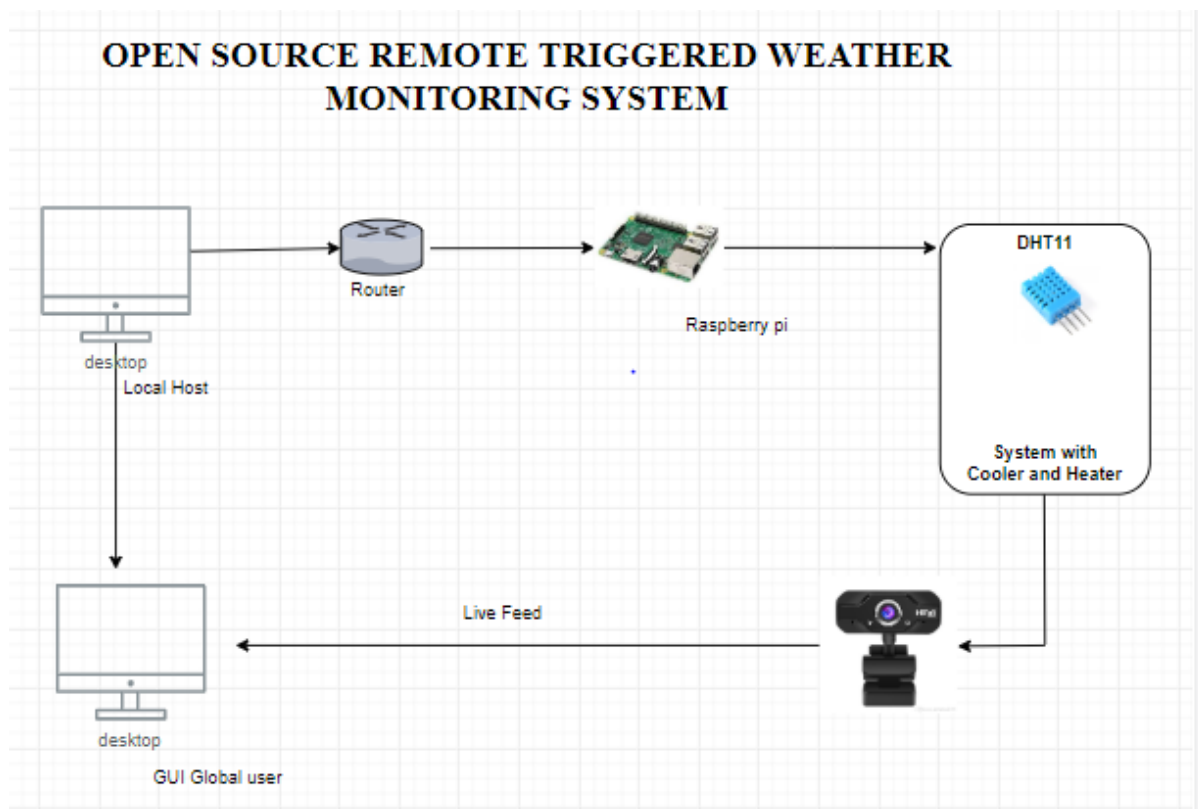
Fig.1. Block diagram of proposed Open Source Remote Triggered Weather Monitoring System

Table. I. Duplicating the hardware and its functions

Hardware	Configurations	Functions
Raspberry pi	This SoC includes a 32-bit ARM1176JZFS processor, clocked at 700MHz, and a Video core IV GPU. It also has 256MB of RAM in a POP package above the SoC. The Raspberry Pi is powered by a 5V micro USB AC charger or at least 4 AA batteries	The raspberry pi model used is the main part in this system, it's the main processer where it takes data from the system and gives to the user for its particular applications
DHT 11	DHT11 digital temperature and humidity sensor is a composite Sensor contains a calibrated digital signal output of the temperature and humidity	The function of the dedicated model of dht11 module is collection technology and the temperature and humidity sensing technology, to ensure that the product has high reliability and excellent long-term stability.
USB Camera	The usb camera is the camera which will be connected ti the system throw USB poart , which have some software to run	It is used for the live streaming of the system to the user. so that user can easily know the status of the system , weather it is working in condition or not

2.1. Working:

The raspberry pi poi pins will be connected with the DHT11 sensor and the USB Camera attached to it. And raspberry pi desktop setup will be done. And the python code which has access to call the html page for the device and to collect

the data from the raspberry pi. When the python code will be running in the raspberry pi terminal it tarts taking the data from the device, the system will be installed in the system where you need to maintain a particular temperature. so soon after it starts recording the data, that data will be stored in a file and will be automatically updated in the data base, when a user login to the particular html page and he can see the temperature at particular time and it changing with the time.

III. Real-Time Results of the Proposed System

The soon after the python code will be running the blow html page will open where the user has to login and can see the data with the live stream. Fig.2 shows the page to sign up to the user. Fig.3 shows the login the user.

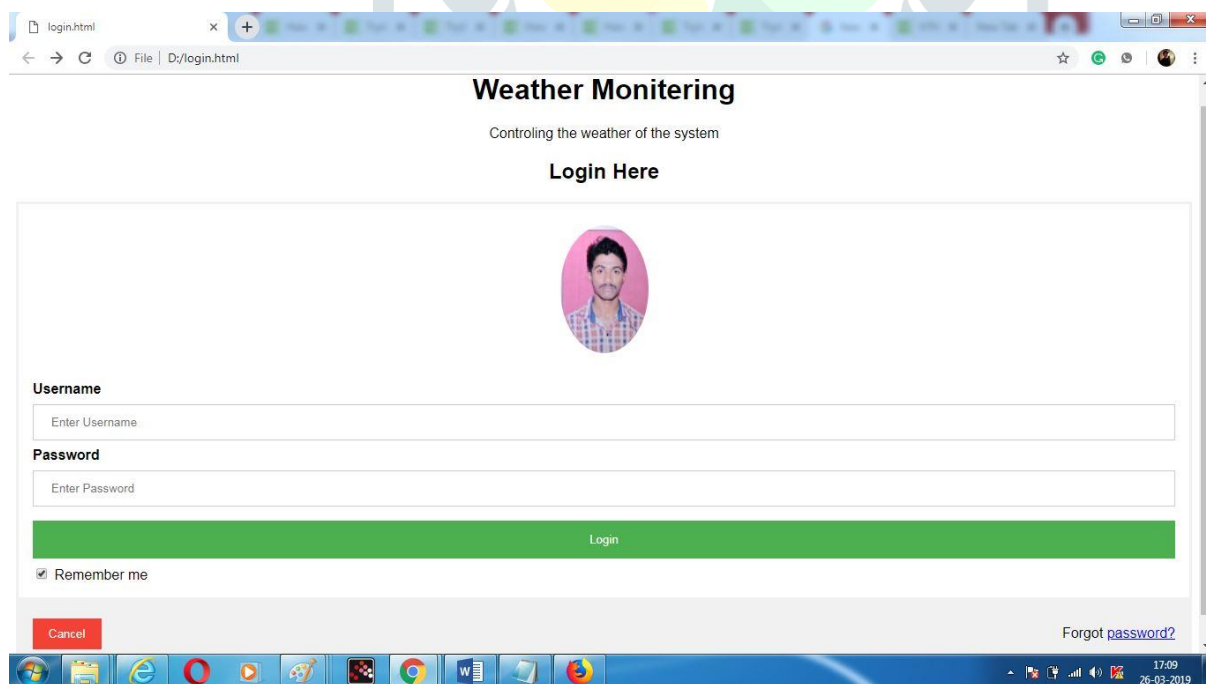

Fig.2 Sign up page of the user

Fig. 3 Login page to the user

So soon after the user logins he can see the live stream of the system with data being downloaded , with this data , if the temperature comes down to some value he can monitor the temperature to increase or if the temperature increase he can decrease the temperature by making on some cooling devices , so this in below page soon after it reaching some

values he has button to turn on heating devices and turn on some codling devices , this also he/she can do it from the remote places , so from any place the industry can be controlled , when you cannot work in the industry with the heavy temperatures.
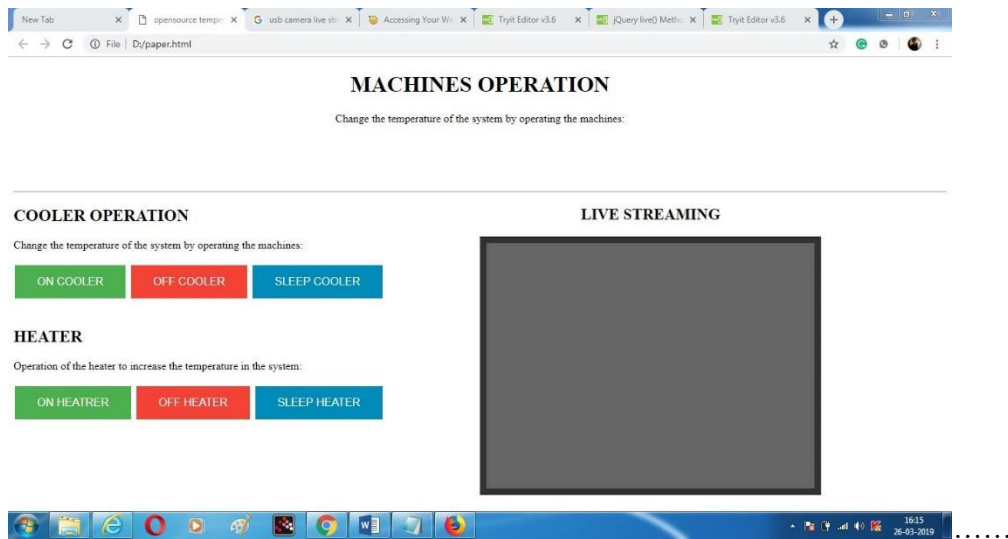

Fig. 4. Machine operation page

The following result was observed over the webpage for the temperature and humidity readings. The above work is completed successfully and we were able to access the data locally as well as globally.
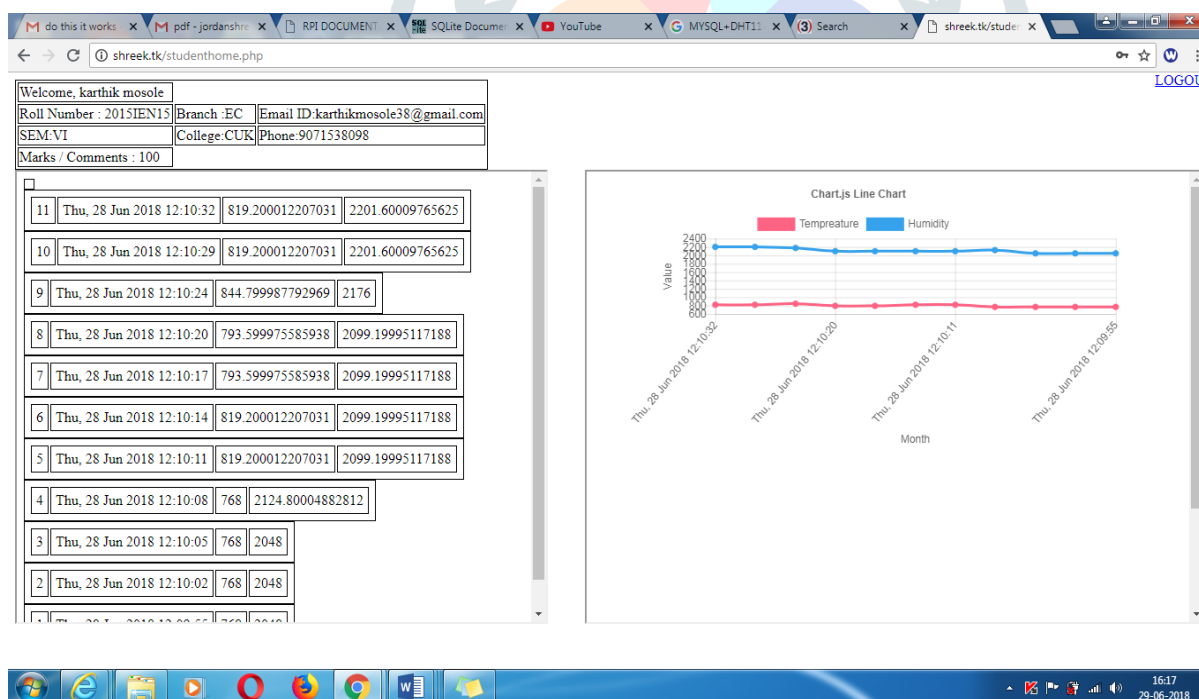

Fig. 5. Temperature and humidity readings

Here in the results, we have the temperature and humidity is being displayed, on the bases the graph also being displayed, with this in another html page we have live stream of the system and there it has two buttons. The live stream is to watch the system working, and the buttons are for, when a temperature reaches some decreases below some point, there is a button to on the HEATER byt name ON HEATER, when you press the button on heater the machine starts the to increase temperature, and when it the temperature increase the temperature there is another button to start the cooler by name ON COOLER. So this system is basically for the industrial purpose, where a certain temperature has to be

maintained and a human cannot go inside the system for every it operations, here In this one the temperature can be known from any remote places and he can operate for control the temperature of the system to a certain value. Or to maintain a particular temperature

IV. Conclusion

In this paper we have presented the results of the installed system and which is consists of raspberry pi connected to 5v and DHT11 sensor in a room and MOTOR and A cooler attached to it. We have noted the temperature change in the room we recorded the change in temperature and we set some minimum and maximum temperature, when the system reaches above or below the temperature value that has given, we can operate the cooler and the heater to maintain the particular temperature in the room. The python code is the main backend in making it remote triggered and, it helps to operate the motor and cooler with the remote triggered buttons of html.

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