IoT based Humidity and Temperature Monitoring System using Arduino Uno

Akilesh M
Department of Electronics and Communication Engineering,
Knowledge Institute of Technology,
Salem,Tamilnadu.

Shanmuga Sundaram R
Assistant Professor,
Department of Electronics and Communication Engineering,
Knowledge Institute of Technology,
Salem,Tamilnadu.

Naveen Kumar V S
Department of Electronics and Communication Engineering,
Knowledge Institute of Technology, Salem,Tamilnadu

Shenbagapriya M
Assistant Professor,
Department of Electronics and Communication Engineering,
Knowledge Instituteof Technology, Salem,Tamilnadu.

Praveen K
Department of Electronics and Communication Engineering,
Knowledge Institute of Technology,
Salem,Tamilnadu

***Abstract*:- Internet of Things (IoT) plays a pivotal part in ourmundane daily life by controlling electronic devicesusing networks. The controlling is done by minutely observing the important parameters which generate vital pieces of information concerning the functioning of these electronic devices. Simultaneously, this information will transmit these vital statistics from the transmitting device as well assave the same on the cloud to access by the applications and supplementary procedures to use them. This scrutiny associates the outcomes of the environmental observances like the humidity and temperature measurements using sensors. The gathered information could be profitably used to produce actions like distantly dominant cooling, heating devices, or long term statistics, which will be useful to control the same. The detected data are uploaded to the cloud storage through network and associate focusing on global attention onto IoT as a using android application. The system employs Arduino UNO and an ESP8266 Wi-Fi module. Theexperimental results show the live temperature and humidity of the surroundings and the soil moisture of any plant using Arduino UNO is mainly used here for checking the temperature and humidity sensor element. The sensors are used for measuring the temperatures from the surroundings, storing displayed information with different devices. Here, cloud provisioning. The information thus garnered in the ESP8266 Wi-Fi module has been used for datastoring purpose.**

Keywords: Arduino, WIFI Module, Temperture and Humidity Sensor.

OVERVIEW:

internet. The devices may vary from the temperature measuring equipment and vehicles SOS system to other electronic devices such as sensors, software‟s, and network connectivity facilities, which sanction collecting and exchanging data. The twentyfirst century has witnessed a massive paradigm shift to and temperature sensors can use [6]. Resistors, semiconductors, thermistors estimate burgeoning discipline with multiple possibilities and diverse opportunities for growth and development [1]. Internet connection facilitates the smooth functioning of the devices that have become indispensable parts of our day-to-day lives and existence. The Internet offers the provision to link and network different kinds of devices like sensors and fitness devices. In the changed scenario post the September 11, 2001 attack on the United States where surveillance has gained paramount importance in proposed model security and survival, the internet facilitates wholesomeand perfect monitoring systems using closed circuit cameras [2]. All these devices that enable them the globe via the internet [3]. In order to cut down on human effort and involvement, of late people increasingly depend on embedded systems to control and monitor the factors affecting the ecosystem. Temperature and humidity are vital in observing andunderstanding nature. IoT comes into the picture here by significantly enhancing the efficiency of the mechanism and systematically cutting down on human involvement, and thereby overall expenditure[4]. Practically, every part of exercise contains controlled schedules of temperature as well as humidity. However, the exact value of temperature with its significant feature in any field is essential in monitoring [5]. Constant perception in temperature is utilized in various industries like the pharmaceutical industry as the driving force behind these monitoring systems, computerized and straightforward temperatures values. These components are present inside the sensor to retrieve the temperature in consonance with the circumstances. The primary goal of our system is to supervise the live temperature and humidity within a low cost [7]. Raspberry Pi is the observational system or controller which is used for the cloudsaving. Python is the programming language which is utilized in Raspberry Pi. HTU 211D sensors is a temperature sensor which is used here for the sensing

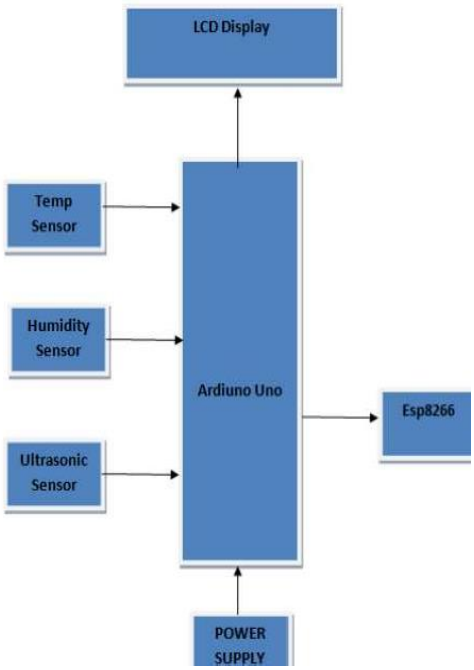
purpose [8]. This comprises of temperature ascertaining capacity and favorable fundamental position of utilizing HTU 211D sensors, which boasts of less weight and ease of use. The sensor is associated with Raspberry Pi utilizing connecting wires. Temperature sensor HTU 211D sensors is utilizing is perused put away, and shown in the Raspberry Pi unit [9]. IoT based devices in homes and industries are used for controlling all the electrical or electronic devices which are present. Additionally, the saved information of the IoT devices can be controlled from anywhere [10]. The sensor analyzes the graphical representation of the observed data in every userdefined format wherever in the world. In this work, IoT based Arduino with Raspberry Pi microcontroller is used. Humidity and temperature monitoring using Arduino is an exciting and secure process. Furthermore, this flexible systemobtains more values in calculating the actuator from the data saved on the internet [11]. For connecting the to upload input as well as output to the Internet using is accessible for monitoring and analysis Arduino board with Raspberry Pi, USB line serial interface is essential to connect with any application [12]

LITERATURE SURVEY:

Arduino controller system is used for measuring the temperature and wetness of the devices, pressure, and height measurement. The setup contains the height measuring device and a measuring or controlling instrument. In this work, they proposed an Arduino UNO with Raspberry Pi data processing unit [13]. Along with this setup, a Cube satellite is included here to supply the data of weather condition when no network coverage is available. This method has advantages like ease of construction, portable device; price is economical, low power, and a reliable system. However, there are some disadvantages like not used in long-distance while powerful transceiver sections are not present, and the gas balloon is also hauling, and parts could be broken in the rain or during practice. Alternative energy panel method did a significant role in measuring the aforementioned parameters [14]. The apparent statistical data are first collected and then sent by the use of a GSM module through the receiver. A server is used here for connection and collection of information. Weather surveillance development system can be used in gathering real-time information as well as for transmission [15]. They have achieved by introducing a VAISALA WXT520 weather transmitter device to transmit theinformation from one place to another place [16]. This device senses all the ecological parameters and their ratio. Then the collected real- time information‟s are transmitted wirelessly over a long distance through GSM [17]. This method provides flexibility because, in this method, one can add or remove the measuring parameters. Santhosh et al. [18] had projected a new model for ecological observation applications. In this method, they proposed a system for patient monitoring and transmitting their measured data to the doctors. The medical base station and variety of distributed wireless device nodes are employed in this work for transmitting andreceiving purpose [19]. Here the Base station is developed by Raspberry Pi device node along with the Zigbee [20]. The device is accessed by the use of nodes with internet Wi Fi for gathering the information from the transmitting place. The web application which is developed is Apache protocol internet server [21]. This method has the following advantages like affordable, compacted, easy to modify, and simple to keep up and have the drawback of group action sensing modalities to receiver nodes [22]. Additionally, internet interface based systems are developed that utilizes a wireless device network (WDN) for agricultural area monitoring [23]. WDN consists of a frequency transmitter and a receiver. AVR-ZigBee, Bluetooth-module, temperature, humidity, soil wet sensors, and LCDs are used in this research [24]. Smart PZT sensors were used as an actuator and receiver, coupled with two XBee‟s and two Ardiuno as signal generator and signal receiver in damage identification [25]. This method is reliable and economical for agricultural unit‟s observationsystem.

PROPOSED SYSTEM:

In this Arduino Project we will figure out how to utilize the DHT11 or the DHT22 sensor for estimating temperature and moistness with the IOT hub MCU. By this project we are going to get the values to our mobiles and computers. So, we can able to know the exact values of temperature in the lab. It is easy to operate and able to understand easily. Live temperature or moistness worth is sent to a scrounge recipient through remote signal. TheDHT11 sensor detects mugginess and temperature, and sends the data to computerized stick 5 of Arduino MCU, From Arduino MCU, stickiness and temperature esteems are transferred to the Cloud at regular intervals of time through ESP8266 WIFI module. From the Cloud, humidity and temperature values can be seen graphically on Firebase console platform from anywhere in the world. With the help of WIFI module we can able to access the data.



Block Diagram of Proposed SystemSYSTEM MODELS :

HARDWARE REQUIREMENTS

- Power supply
- Lcd display
- Arduino
- Temp senso
- Humidity sensor
- Ultrasonic senso
- Wifi module

SOFTWARE REQUIREMENTS

- Arduino IDE
- Embedded C
- Proteus

WORKING:

The Temperature and Humidity Sensor Project will be controlled using an application named FIRE BASE CONTROL (Available for Android and windows) using Arduino, an Ethernet Shield and its libraries. User can securely login over Fire base control to control and monitor the room temperature and humidity. The code includes: The Arduino sketch. The Arduino sketch handles the interchangesby setting up the system. The sketch runs the program and conveys each line in turn over the server. Clients can login remotely on this web server. Utilization of DHT22 Sensor: DHT22 capacitive moistness detecting computerized temperature and dampness module is one thatcontains the intensify that has been adjusted carefully to flag yield of the temperature and stickiness sensors. The sensor incorporates a capacitive sensor, wet parts and a high precision temperature, estimation gadgets, and associated with a superior 8-piece microcontroller. The item has great quality, quick reaction, solid enemy of sticking capacity, and signific expense. It is certainly dependable and has incredible perseverance. fromFirebase and glue it into the line the program the Hostname and Password with your Fig (1) Block Diagram of Monitoring system The Temperature andHumidity Sensor Project will be controlled using an application named FIRE BASE CONTROL (Available for Android and windows) using Arduino, an Ethernet Shield and its libraries. User can securely login over Fire base control to control nd monitor the room temperature and humidity. The code includes: The Arduino sketch. The Arduino sketch handles the interchanges by setting up thesystem. The sketch runs the program and conveys each line in turn over the server. Clients can login onthis web server. Utilization of DHT22 Sensor: DHT22 capacitive moistness detecting computerizedtemperature and dampness module is one that contains the intensify that has been adjusted carefully to flag yield of the temperature and stickiness The sensor incorporates a capacitive sensor, wet parts and a high precision temperature, estimation gadgets, and associated piece microcontroller. The item has great quality, quick reaction, solid enemy of sticking capacity, and significant expense. It is certainly dependable and has from Firebase and glue it into the line the program. Next, supplant WIFI name and Wi-Fisecret key in the two lines given beneath in the program.At that point assemble the program and transfer to an Arduino Uno through Arduino IDE. Guarantee that WiFi modem and web associationin your Smartphone or PC are working appropriately. After transferred a program, theTemperature and Humidity information is transferred on Firebase Console stage. You cansee it graphically in the private view window ofyou divert as appeared in Fig: Also, you can readyto see the transferred informationfrom sequentialport of Arduino IDE. Circuit outline for observing moistness and temperature is appeared in Fig. 2. It is worked around Arduino MCU, DHT11 sensor and ESP8266 Wi-Fi module. In this task, we will construct a little circuit to interface Arduino MCU with DHT11 Temperature and Humidity Sensor. One of the fundamental utilizations of interfacing DTH11 sensor with Arduino is climate observing. All the DHT11 Sensors are precisely adjusted inthe research facility and the outcomes are putaway in the memory.A solitary wire correspondence can be set up between any microcontroller like Arduino and the DHT11Sensor. Also, the length of the link can be up to 20 meters. The information from the sensorcomprises of fundamental and decimal parts

RESULT:

The code is uploaded in the Arduino 1.8.10 software application and the Arduino MCU board were configured. In the Firebase Console the account will be created then the Data base will be created. According to the data base the Threshold values are inserted to the required temperature values and the humidity values .This make the values as a barrier when the humidity crosses its limit in a room atmosphere the notifications will be alerted and the with the google account when we logon to the account the values are displayed

OUTPUT

CONCLUSION:

IoT based temperature and humidity detecting device rovides an efficient and definitive system for monitoring agricultural parameters. The system also provides a corrective movement or decision making system. IoT based monitoring of area is a handiest, but it also allows the consumers to research the correct modifications within the surroundings and for taking possible action. It is inexpensive and consumes much less electricity. The Gross Domestic Product (GDP) per capitals in agriculture can be multiplied and helps to add our need parameters. This set up can also control the DC fan, motor, and water levels for supporting farmers. Then the measured values of humidity and temperature values from the Arduino MCU are uploaded to the cloud. Then the collected data are transferred to the farmers live through the GSM to their cell phones. Based on the water level measuring system, the collected data are sending to the farmer‟s cell phone continuously. They can switch on or off their motor based on the collected data from the water level measuring system. It is beneficial for the farmers to control the motors as well as can watch their plants from their house. Moreover, also it will help the plants from the overwatering. This system is beneficial for water decisionmaking ied d ‟scarcity problems. IoT based system can be extended for controlling extraordinary electronic and electric devices from remote locations. Moreover, the system also can be extended for finding the moisture of soil and the farm monitoring for animals growth.

REFFRENCES:

[1] Bhargav Goradiya, and H. N. Pandya, “Real time Monitoring & Data logging Systemusing ARM architecture of Raspberry pi & Ardiuno UNO” International Journal of VLSI and Embedded Systems-IJVES. ISSN: 2249 Vol 04, PP: 513-517, July 2013

[2] M. Rahaman Laskar, R. Bhattacharjee, M. Sau Giri, and P. Bhattacharya, “Weather Forecasting using Arduino Based Cube Twelfth International Multi Information Processing (IMCIP)

[3] Vinayak Appasaheb Pujari, M. M. Raste, and A. A. Pujari, “Cost Effective Automatic Weather Station-a Review”, International Journal of Electrical and Electronics Engineers (IJEEE) No. 8 Issue 01, January June 2016.

[4] C. H. Chavan, and V. Karande, “Wireless Monitoring of Soil Moisture, Temperatu Humidity using Zigbee in Agriculture”, International Journal of Engineering Trends and Technology (IJETT)-Volume 11 Number 10 May 2014.

[5] Mayur Randhir, R. R. Karhe, “Monitoring Of Environmental Parameters by Using Cloud Computing” International Journal of Computer Science Trends and Technology (IJCST) Volume 3 Issue 3, PP: 151-155. MayJune 2015.

[6] Nelson Gonzalez, Charles Miers, Fernando Red´ıgolo, Marcos Simpl´ıcio, Tereza Carvalho, Mats N¨aslund and Makan Pourzandi, “A quantitative analysis of current security concerns and solutions for cloud 50 computing” Journal of Cloud Computing: Advances, Systems and Applications 2012.

[7] Mahesh D. S, Savitha S, and Dinesh K. Anvekar, “A Cloud Computing Architecture with Wireless Sensor Networks for Agricultural Applications”International Journal of Computer Networks and Communications Security Vol.2, No.1, January 2014, 34–38 Available online at: www.ijcncs.org ISSN 2308-9830.

[8] C. H. Chavan, and P. V.Karande, “Wireless Monitoring of Soil Moisture, Temperature & Humidity Using Zigbee in Agriculture” International Journal of Engineering Trends and Technology (IJETT) – Volume 11 Number 10 - May 2014.

[9] Basil Ahammed, Design & Implementation of Smart House Control Using LabVIEW, InternationalJournal of Soft Computing and Engineering (IJSCE),1 (6), 2012.

[10] Dingrong Yuan, Shenglong Fang, Yaqiong Liu, The design of smart home monitoring system based on WiFi electronic trash, Journal of Software, 9 (2), 2014, 425-428.

[11] Jiansheng PENG W.L, Qiwen HE, Design of smart home system based on the wireless MCU CC2510, Journal of Hechi University, 10, 2008.

[12] Patricio G, Gomes L, Smart house monitoring and actuating system development using automatic code generation, Industrial Informatics, 7th IEEE International Conference, 256-261, 2009, 23-26. Vinay Sagar K.N, Kusuma S.M, Home Automation using Internet of Things, IRJET, 02,2015. 51

[13] Girish Birajdar “Implementation of Embedded Web Server Based on ARM11 and Linux using Raspberry PI” International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-3 Issue-3, July 2014.

[14] Roselle B. Anire et al., “Environmental Wireless Sensor Network using Raspberry Pi 3 for Greenhouse Monitoring System”, IEEE 9th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment and Management (HNICEM), 2017.

[15] KonstantinosTzortzakis, et al., “Wireless Self Powered Environmental Monitoring System for Smart Cities based on LoRa”, Panhellic Conference on Electronics and Telecommunications (PACET), 2017.