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COLLEGE OF ENGINEERING
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Thalavapalayam, Karur – 639 113.

TEMPERATURE AND HUMIDITY MONITORING USING NODE MCU

A MINOR PROJECT - II REPORT

Submitted by

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BACHELOR OF ENGINEERING

in

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous)

KARUR – 639 113

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M.KUMARASAMY COLLEGE OF ENGINEERING,

KARUR

BONAFIDE CERTIFICATE

Certified that this **18ECP103L-Minor Project II** report "**TEMPERATURE AND HUMIDITY MONITORING USING NODE MCU"** is the bonafide work of "**BALADEVA K (9276221BEC019),BHALARAM KRISHNA S A (9276221BEC025),DHILIP KUMAR R (9276221BEC046), HARRISH SUNDAR A (9276221BEC062)** who carried out the project work under my supervision in the academic year **2022-2023 - EVEN**.

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This Minor project-III report has been submitted for the **18ECP103L – Minor Project-II** Review held at M. Kumarasamy College of Engineering, Karur on _____.

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PROJECT COORDINATOR

INSTITUTION VISION AND MISSION

Vision

To emerge as a leader among the top institutions in the field of technical education.

Mission

M1: Produce smart technocrats with empirical knowledge who can surmount the global challenges.

M2: Create a diverse, fully -engaged, learner -centric campus environment to provide quality education to the students.

M3: Maintain mutually beneficial partnerships with our alumni, industry and professional associations

DEPARTMENT VISION, MISSION, PEO, PO AND PSO

Vision

To empower the Electronics and Communication Engineering students with emerging technologies, professionalism, innovative research and social responsibility.

Mission

M1: Attain the academic excellence through innovative teaching learning process, research areas & laboratories and Consultancy projects.

M2: Inculcate the students in problem solving and lifelong learning ability.

M3: Provide entrepreneurial skills and leadership qualities.

M4: Render the technical knowledge and skills of faculty members.

Program Educational Objectives

PEO1: **Core Competence:** Graduates will have a successful career in academia or industry associated with Electronics and Communication Engineering

PEO2: **Professionalism:** Graduates will provide feasible solutions for the challenging problems through comprehensive research and innovation in the allied areas of Electronics and Communication Engineering.

PEO3: **Lifelong Learning:** Graduates will contribute to the social needs through lifelong learning, practicing professional ethics and leadership quality

Program Outcomes

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

PSO1: Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.

PSO2: Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrial expectations.

Abstract	**Matching with POs, PSOs**
DHT11Sensor, ESP32 .	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO9,PO10,PO11, PSO1,PSO2

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ABSTRACT

The Temperature and Humidity sensor data send to Thing speak using DHT11. By this method, we can monitor our DHT11 sensor's temperature and humidity data over the internet using the Thing Speak IOT server, and we can view the logged data and graph over time on the Thing Speak dashboard. Node MCU reads the current temperature and humidity from DHT11 and sends it to the Thing Speak server for live monitoring from anywhere in the world. We previously used thing speak with raspberry pi and ESP32 to upload the data on cloud.Thing Speak is a data platform for monitoring your data online, targeted to be used for IOT applications. In the Things peak channel, you can set the data as private or public according to your choice. Thing Speak takes a minimum of 15 seconds to update your readings. It's a great and very easy-to-use platform for building IOT project.

Keywords: DHT11 sensor, ESP32 .

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LIST OF ABBREVIATIONS

ACRONYM		ABBREVIATION
IOT	-	Internet Of Things
MCU	-	Microcontroller

CHAPTER 1

INTRODUCTION

Temperature and humidity are important variables to determine changes in the state of a substance or object. By knowing changes in temperature and humidity, we can know the direction of physical change. Therefore, it is veryimportant to monitor changes in temperature and humidity in a system. Monitoring temperature and humidity is very important, especially in the industrial sector, therefore there are several ways to monitor temperature and humidity. One way to monitor changes in temperature and humidity requires a DHT11 device or sensor. By using this sensor, users can monitor the temperature and humidity of an object remotely. So that users can monitor a dangerous object without having to be close together.

The advantage of this sensor is that it is sensitive to changes in temperature and humidity every second that can be seen in real time. Based on this, the author wants to create a monitoring system for measuring temperature and humidity remotely using temperature and humidity sensors to make it easier for users to monitor the temperature of an object remotely. This tool system is based on the NodeMCU microcontroller development board as a control center as well as a DHT11 sensor as a tool for measuring temperature and humidity as well as data.

The results of DHT11 temperature and humidity sensor readings will be continued by sending real time information every second with ° C units which can be seen using a visual application. basic net which is desktop-based for monitoring data with communication via wifi that is running well and stable. Temperature and humidity measurement data can be stored through an online database, namely firebase. Because the sensor data is stored by NodeMCU to the Firebase Real-time Database, then the VB application can access it anytime and anywhere.

CHAPTER 2

LITERATURE SURVEY

2.1. Monitoring

Monitoring (Indonesian: monitoring) is monitoring which can be described as awareness of what one wants to know, high-level monitoring is undertaken in order to make measurements over time that indicate movement toward or away from it. Monitoring will provide information about the status and the tendency that the completed measurements and evaluations are repeated over time, monitoring is generally carried out for a specific purpose, to check against the following process objects or to evaluate conditions or progress towards management outcomes objectives for the effects of actions of some type including actions to maintain ongoing management.

2.2. Modul NodeMCU ESP8266

NodeMCU is an electronic board based on the ESP8266 chip with the ability to carry out microcontroller functions and also an internet connection (WiFi). There are several I / O pins so that they can be developed into a monitoring and controlling application for the IOT project. The ESP8266 NodeMCU can be programmed with the Arduino compiler, using the Arduino IDE. The physical form of NodeMCU ESP8266, there is a USB port (mini USB) so that it will make programming easier. NodeMCU ESP8266 is a development derivative module of the ESP8266 family of IoT (Internet of Things) platform modules of type ESP-12. In function, thismodule is almost similar to the Arduino platform module, but what makes it different is that it is devoted to “Connected to the Internet”.

2.3. Sensor

Sensor is a tool for detecting / measuring something, which is used to change mechanical, magnetic, and thermal variations, rays and chemistry become voltage and electric current. In the environment of control systems and robotics, sensors provide similarities that resemble eyes, hearing, nose, tongue which will then be processed by the controller as the brain.

2.4. DHT11

Sensor DHT11 is a sensor with digital signal calibration that is able to provide temperature and humidity information. This sensor is classified as a component that has a very good level of stability, especially when coupled with the ATmega8 microcontroller capability. Highest quality product, fast reading response, and anti-interference capability, at an affordable price. DHT11 has a very accurate calibration feature.

This calibration coefficient is stored in the OTP program memory, so that when the internal sensor detects something temperature or humidity, this module reads the sensor coefficient. Small size, with signal transmission up to 20 meters, making this product suitable for many applications. Air humidity describes the moisture content in the air which can be expressed as absolute humidity, relative humidity and water vapor pressure deficit. Relative humidity is the comparison between the actual water vapor content or pressure with the saturation state or the air capacity to accommodate water vapor.

Electronic equipment can also rust easily if the air around it is high enough humidity. Therefore, Information about the humidity in a certain area becomes something important to know because of the effects it causes. Information about the humidity value obtained from the measurement process. The tool usually used to

measure air humidity is a hygrometer. DHT11 is a digital sensor that can measure the temperature and humidity of the surrounding air. This sensor is very easy to use with Raspberries. Has a very good level of stability and features a very accurate calibration. The calibration coefficient is stored in the OTPprogram memory, so that when the internal sensor detects something, then this module balances the coefficients in its calculations.

2.5. Firebase

Firebase is a realtime database service provider and backend as a service. An application that allows developers to create APIs to be synced for different clients and stored in the Firebase cloud. Firebase has many libraries that make it possible to integrate this service with Android, Ios, Javacript, Java, Objective-C and Node.JS. Firebase databases are also accessible via the REST API.

The REST API uses the Server-Sent Event protocol by establishing an HTTP connection to receive push notifications from the server. Developers use the REST API for subsequent data posts Firebase client library that has been implemented in an application that is built which will retrieve data in realtime. Developers can also use this database to secure data using the Firebase server with existing rules. For hosting files, Firebase provides hosting for static files with CND and SNL facilities.

CHAPTER 3
EXISTING SYSTEM

3.1. BLOCK DIAGRAM

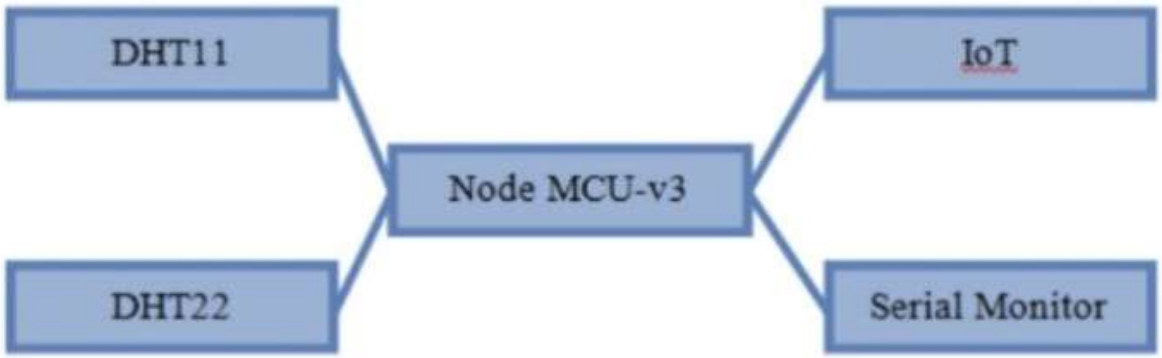

Fig.3.1 Block diagram

The working principle of temperature and humidity monitoring using NodeMCU from Fig.3.1 involves the use of a microcontroller unit (MCU) and a sensor to measure the temperature and humidity of the surrounding environment.

NodeMCU is an open-source firmware and development kit based on the ESP8266 Wi-Fi module. It is a powerful and cost-effective platform for building Internet of Things (IoT) projects. NodeMCU is equipped with Wi-Fi capabilities, which enables it to communicate with other devices over the internet.

The NodeMCU reads the data from the sensor and sends it to a cloud platform or a local server for further processing and analysis. This can be done using various communication protocols such as HTTP, MQTT, or TCP/IP.

3.2. CONSTRUCTION

- Node MCU
- DHT11 SENSOR
- 16x2 LCD DISPLAY
- ESP826 WIFI MODULE
- JUMPERS

3.2.1. NODEMCU

NodeMCU (Fig.3.2) is an open source firmware for which open source prototyping board designs are available. The name "NodeMCU" combines "node" and "MCU" (micro-controller unit).Strictly speaking, the term "NodeMCU" refers to the firmware rather than the associated development kits.

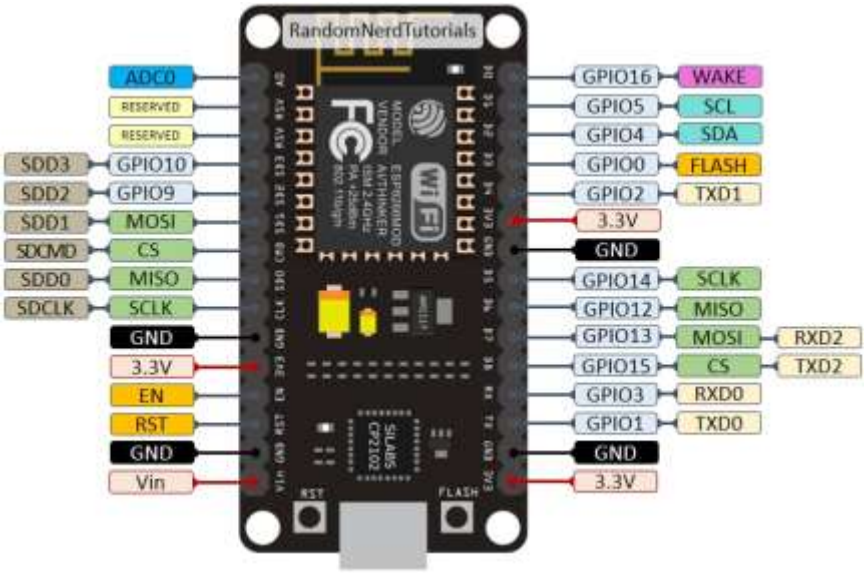

Fig.3.2 NodeMCU

The firmware uses the Lua scripting language. The firmware is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson[9] and SPIFFS.[10] Due to resource constraints, users need to select the modules relevant for their project and build a

firmware tailored to their needs. Support for the 32-bit ESP32 has also been implemented.

3.2.2. DHT 11 SENSOR

Varying temperature and humidity information of the environment are captured by the DHT11 component (see Fig.3.3). It is a Temperature and Humidity Sensor which has a calibrated digital signal output. The DHT11 ensures a high reliability and long-term stability by using the exclusive digital-signal-acquisition technique and temperature & humidity sensing technology. With a resistive-type humidity measurement component and a temperature measurement component, the DHT11 provides a reliable data. Its element is calibrated in the laboratory under extremely accurate humidity calibration conditions and stores the calibration coefficients in memory as programmes for later use (D-Robotics, 2010).

The temperature and humidity sensor used for this study has a coverage range of up to 20meters. It complies with standard reference temperature for industrial measurement which is given as 200c-250c; details of how this was arrived at were discussed by Doiron (2007)It has low power consumption and an impressively small size suitable for most projects. It is worthy of note that the DHT11 sensor requires a minimum of one second delay for it to stabilize.

Fig.3.3 DHT 11 Sensor

This delay is imperative to guarantee a reliable data from the sensor (D- Robotics, 2010). Besides temperature measurements, DHT11 also measures relative humidity which is the amount of water vapor in the atmosphere (D- Robotics, 2010). Normally, at the saturation point, water vapor begins to condense to form dew (Shelton, 2008). Changes in the air temperature greatly determine its saturation point. Notably, a higher air temperature holds more water vapor than a cold air temperature. At 0% Relative humidity expressed as The ranges and accuracy of the DHT11 is as follows (D-Robotics, 2010).

- Humidity Range: 20-90% RH
- Humidity Accuracy: ±5% RH
- Temperature Range: 0-50 °C
- Temperature Accuracy: ±2% °C
- Operating Voltage: 3V to 5.5Va percentage - the air is considered totally dry, but condenses at 100%.

3.2.3. 16x3 LCD DISPLAY

An LCD (Fig.3.4) is an electronic display module that uses liquid crystal toproduce a visible image. The 16x2 LCD display is a very basic module commonly used in DIYs and circuits. The 16x2 translates o a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5x7 pixel matrix. LCDs are used in a wide range of applications, including LCD televisions, computer monitors, instrument panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in LCD projectors and portable consumer devices such as digital cameras, watches, calculators, and mobile telephones, including smartphones.

Fig.3.4 16x3 LCD Display

LCD screens have replaced heavy, bulky and less energy-efficient cathode-ray tube (CRT) displays in nearly all applications. A Liquid Crystal Display commonly abbreviated as LCD is basically a display unit built using Liquid Crystal technology. When we build real life/real world electronics based projects, we need a medium/device to display output values and messages. The most basic form of electronic display available is 7 Segment displays, which has its own limitations.

3.2.4. ESP8266 WIFI MODULE

ESP8266 (Fig.3.5) is responsible for connecting the weather monitoring system to internet. This module is inserted on a breakout board adapter so that ESP8266 can be interfaced on a breadboard. ESP8266 is not a just another ordinary module, it has a full-fledged 32-bit microcontroller which requires a program code to function. We will be using a programmer to upload the code to this ESP8266 module which we will see in the later part of this article. It operates on 3.3V and communicates on serial interface with Arduino.

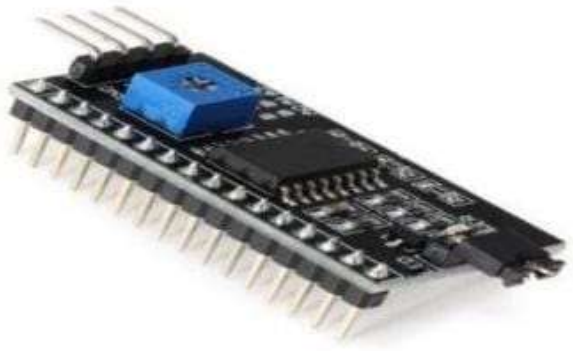

Fig.3.5 ESP8266 Wifi Module

This module has a powerful enough on- board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existance interfaces. it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

3.3. WORKING PRINCIPLE

From Fig3.6 Temperature and humidity sensor work by measuring the capacitance or resistance of air samples. Most of these sensors utilize capacitive measurement to determine the amount of dampness in the air. This sort of measurement relies on two electrical conductors with a non-conductive polymer film laying between them to form an electrical field between them.

Moisture from the air collects on the film and causes changes within the voltage levels between the two plates. This alter is then converted into a computerize measurement of the air’s relative humidity after taking the air temperature into account.

Linkwise Technology step into the world of innovation and automation with a mission of making simple solution for our complex world. Holding on to that mission, Linkwise Technology developed Picobox devices as a prevention to different problem engaging with the fast-progressive industries and businesses.

PICOBOX offers not just prevention but a solution, Linkwise Technology Temperature and Humidity Monitoring System or also known as TH Optimum Solution are reliable in monitoring changes in the room environment and able to send alarm once a certain change needs to be adjusted.

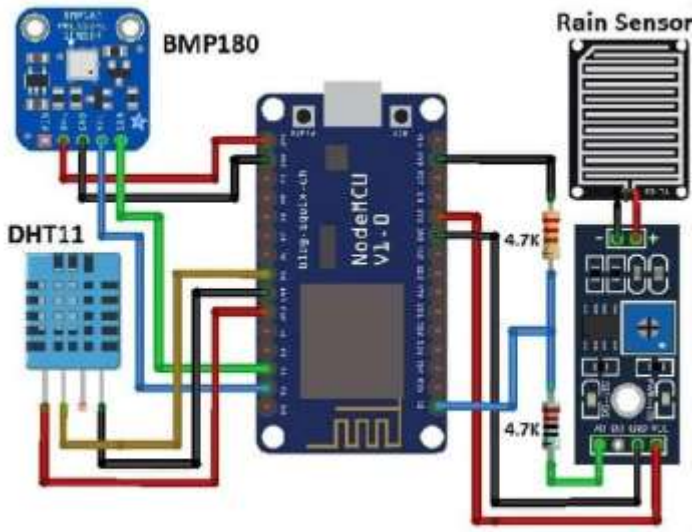

Fig.3.6 Circuit Diagram

CHAPTER 4

RESULTS AND DISCUSSION

The NODEMCU was used in developing the sketches that were uploaded as firmware into the microcontroller. Thereafter, the system could work without the user's intervention. Libraries are required for a robust firmware development using Arduino. In this case, we used the 'Liquid Crystal' and 'dht' libraries. Next we set the Arduino pins and attached them to the LCD for display. NODEMCU pins were attached to pins respectively on the LCD.

The 'pinMode 'of NODEMCU pin12 was set as INPUT as shown in Fig.4.1. This is the pin that reads the numeric values from the signal pin of the DHT11 sensor. At least a second delay is required to get reliable readings from the DHT11 sensor. However, we used three (3) seconds delay to ensure that the previous values have been displayed. It is also important to confirm that the temperate and humidity readings are within the acceptable range for the sensor. In this work the humidity range was between 20-90 relative humidity, while the temperature ranged between 0-500c. Once the read values are within range, it is displayed on the LCD screen

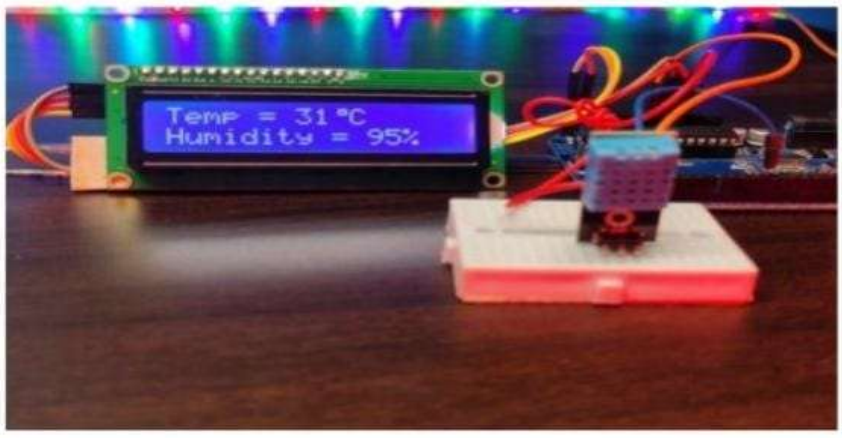

Fig.4.1 Circuit connection

CHAPTER 5
CONCLUSION AND FUTURE WORK

Conclusions

NodeMCU can be an effective and low-cost solution for monitoring temperature and humidity in various environments.The accuracy of the readings may depend on the quality of the sensor used, as well as environmental factors such as air flow and placement.Data collected can be transmitted to a server or database for further analysis and visualization.

Future work

Implementing additional sensors, such as air quality or light sensors, to create a more comprehensive environmental monitoring system.Utilizing machine learning algorithms to predict changes in temperature and humidity, and alert users to potential issues or anomalies. Developing a user interface or dashboard to display real-time data and provide insights and recommendations for maintaining optimal environmental conditions.Integrating with smart home devices to automatically adjust temperature and humidity settings based on the collected data.

APPENDICES

```
/*Temperature monitoring system.
 * https://srituhobby.com
 */

#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <DHT.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

DHT dht(D3, DHT11); //(sensor pin,sensor type)

char auth[] = ""; //Enter the Auth code which was send by Blink
char ssid[] = "";  //Enter your WIFI Name
char pass[] = "";  //Enter your WIFI Password

BlynkTimer timer;

void sendSensor() {
  float h = dht.readHumidity();
  float t = dht.readTemperature();

  if (isnan(h) || isnan(t)) {
    Serial.println("Failed to read from DHT sensor!");
    return;
  }

  lcd.setCursor(0, 0);
  lcd.print("Temp : ");
  lcd.print(t);
  lcd.setCursor(0, 1);
  lcd.print("Humi : ");
  lcd.print(h);

  Blynk.virtualWrite(V0, t);
  Blynk.virtualWrite(V1, h);
```

```
}
void setup() {

  Wire.begin(D2, D1);
  lcd.init();
  lcd.backlight();
  Blynk.begin(auth, ssid, pass);
  dht.begin();
  timer.setInterval(100L, sendSensor);
}

void loop() {
  Blynk.run();
  timer.run();
}

void sendSensor() {

// Humidity and temperature values are obtained and these values are inserted into
float variables

  float h = dht.readHumidity();
  float t = dht.readTemperature();

// The sensor is checked

  if (isnan(h) || isnan(t)) {
    Serial.println("Failed to read from DHT sensor!");
    return;
  }

// These values are printed on the LCD

  lcd.setCursor(0, 0);
  lcd.print("Temp : ");
  lcd.print(t);
  lcd.setCursor(0, 1);
  lcd.print("Humi : ");
  lcd.print(h);
// These values are printed on the Blynk app
  Blynk.virtualWrite(V0, t);
  Blynk.virtualWrite(V1, h);
```

```
}
```
In the setup function,

```
void setup() {

//The wire library is begin

  Wire.begin(D2, D1);

//The I2C library is begin
  lcd.init();

// LCD backlight is turns on
  lcd.backlight();

//The Blynk library is begin using the Blynk auth token and WIFI connections
deatails

  Blynk.begin(auth, ssid, pass);

//The DHT11 sensor is begin

  dht.begin();

// This code is called the main function

  timer.setInterval(100L, sendSensor);
}
```
In the loop function, the Blynk library is run.

```
void loop() {
  Blynk.run();
  timer.run();
}
```

REFERENCES

[1] Pallavi M. Banait, Nikita P. Bakale, Mayuri S. Dhakulkar, BhushanS. Rakhonde "Cost effective Android based wireless notice board", IJETER2018.

[2] Gaurav Bhardwaj, Gunjan Sahu, Rajan Kumar Mishra "IOT based smart noticeboard", IJERT 2020.

[3] M. Arun, P. Monika, G. Lavanya 2016 "Raspberry Pi ControlledSmart e-Notice board using Arduino", IJCAT 2016.

[4] Dharmendra Kumar Sharma, Vineet Tiwari, Krishnan Kumar, et.al, "Small andMedium Range Wireless Electronics Notice Board using Bluetooth andZigBee", IEEE INDICON 2015.

[5] M. Abila Mary, B. Pavithra, R. Sangeetha, Prof.T.C. Subbu Lakshmi "GSMbased wireless noticeboards using Arduino", IJARTET 2019.

[6] Pooja Pawar, Suvarna Langade, Mohini Bandgar "IOT Based Digital NoticeBoard using Arduino ATMega328", IRJET 2019.

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Organizing Chair

Dr.S.Palanivel Rajan
HoD / ECE

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This is to certify that Dr./Mr./Ms./Mrs. DHILIP KUMAR R of M.KUMARASAMY COLLEGE OF ENGINEERING has presented a paper titled TEMPERATURE AND HUMIDITY SENSOR USING NODEMCU in DST-SERB Sponsored Second International Conference on "Signal Processing and Communication Systems" Organized by the Department of Electronics and Communication Engineering on 07 th March 2023 of our Institution.

Organizing Chair

Dr.S.Palanivel Rajan
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