
INTERNET OF THINGS (IOT): AN INNOVATIVE MODEL OF AUTOMATED FAN SPEED REGULATING SYSTEM

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Abstract :

IoT stands for Internet of Things. In the concept of IoT different things were connected through internet. Internet is one of the media for connection establishment in between different things. An innovative Model performing and giving optimized solution. In an intelligent and in smart way behave automation with the help of sensor.

Our proposed model is an innovative model to regulate speed of fan as per environment aspects. Using DHT11 sensor. DHT11 sensor is the humidity and temperature reading sensor. So that our innovative model, going to sense the temperature and humidity of the real time environment and as per the temperature and humidity the speed of the fan is regulated.

In our research we are going to plan to control the speed of fan remotely by using the concept of IoT. Here we are using Blynk app besides that Arduino UNO with DHT11 sensor. The coding of Arduino UNO platform in embedded C, reads the value of temperature and humidity through the sensor DHT11. Speed of fan is regulated through coding in embedded C. As the temperature and humidity of the environment increases, the speed of fan also increases.

IoT has enabled the automation of traditional home appliances, making them more intelligent and user-friendly. This research paper proposes the development of an IoT-based Fan Control System using the ESP8266 microcontroller and the Blynk mobile application.

Keywords : IoT, Internet, DHT11, things, Arduino, UNO, speed, fan, temperature, humidity, Blynk App, mobile, application, ESP8266

Introduction :

The IoT enables sensors and other device's purpose is to communicate and making smart decisions. Proposed smart innovative model focuses and based on an IoT. In our model the speed of Fan automatic regulates as per the real time environmental conditions. This proposed system based on sensor. The sensor identified named as the DHT11. The sensor measures temperature and humidity, and the system automatically adjust the fan speed to



maintain a comfortable zone in real time environment. Users can also monitor and control the fan remotely, making it efficient, convenient, and energy-saving.

Internet of Things (IoT) is revolutionizing the way everyday devices operate, enabling them to communicate, exchange data, and make intelligent decisions without human intervention [1]. In recent years, there has been a growing demand for smart home appliances that not only provide convenience but also improve energy efficiency [2]. One of the critical areas of focus is climate control, particularly automated fan systems that adjust to environmental conditions in real time.

The proposed model presents an innovative IoT-based automated fan speed regulation system that intelligently adapts the fan's speed according to the surrounding temperature and humidity. By integrating sensors and IoT connectivity, this system ensures that the indoor environment remains comfortable while minimizing unnecessary energy consumption.

The core component of this system is the DHT11 sensor, which accurately measures both temperature and humidity. This ensures that the fan operates efficiently, running at higher speeds only when necessary and slowing down when the environmental conditions are within a comfortable range.

Moreover, the IoT integration allows users to monitor and control the fan remotely through a smart phone or web application. This remote capability enhances convenience, as users can adapt the fan settings without being physically present. Additionally, the system can store historical environmental data, enabling smarter decision-making and further optimization of energy consumption over time.

In short, this IoT-based automated fan speed regulation system represents a convergence of sensors, real-time data processing, and connectivity to create a smart, energy-efficient, and user-friendly real time environmental conditional solution in the form of fan speed regulating system. The system not only provides comfort but also contributes to sustainability by reducing unnecessary power usage.

Literature Review :

- M. A. A. Mashud et. all. (2015) [3] Discusses about PT-100 sensor and driver circuit consists of diode D_1 , Zener diode Z_2 , resistor R_2 - R_5 , variable resistor VR4, VR5, transistor Q_1 , Sensor PT-100 and IC2. They construct the circuit in which transistor Q_1 acts as a stable current source to activate the sensor PT-100.
- Suraj Kaushik et. all (2018) [4] Demonstrates PWM technique is one of the tricks which is the best logic for fan speed controlled by use of temperature reading. For various parameters different graphs were designed and analysis on the speed and temperature data. Here the relationships among different parameters were drawn on various parameters.
- Abdel Rahman H. Hussein (2019) [5] discussion about the IoT is used in many areas like smart homes, healthcare, and agriculture. Although IoT is improving, challenges



like reliability, security, and scalability helps create efficient and smart home automation systems.

- Kinza Shafique et al (2020) [6] the IoT has enabled the development of smart control systems by allowing devices to communicate and operate intelligently through sensors and wireless networks. IoT technology supports real-time monitoring, remote access, and automated control, making it suitable for smart home and industrial applications.

Proposed work :

This model focuses on creating a smart fan control system using IoT and a DHT11 sensor. The system will measure the room temperature and humidity, and automatically adjust the fan speed to maintain comfort and save energy. Users can also control and monitor the fan remotely through a mobile application.

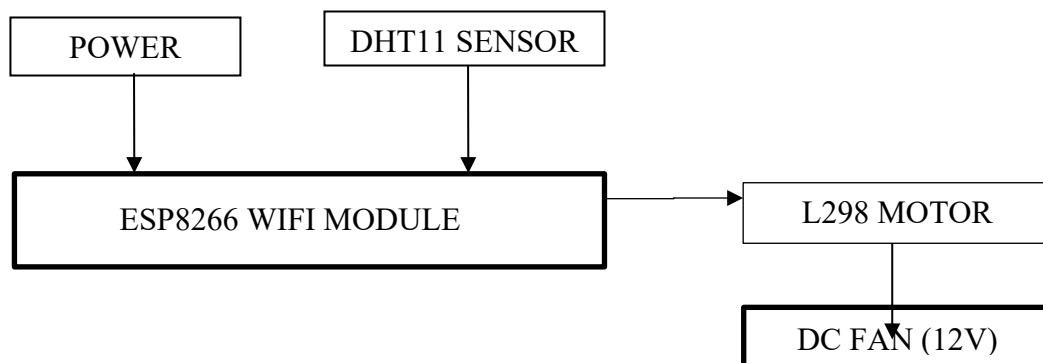


Figure 1: Block Diagram of proposed work

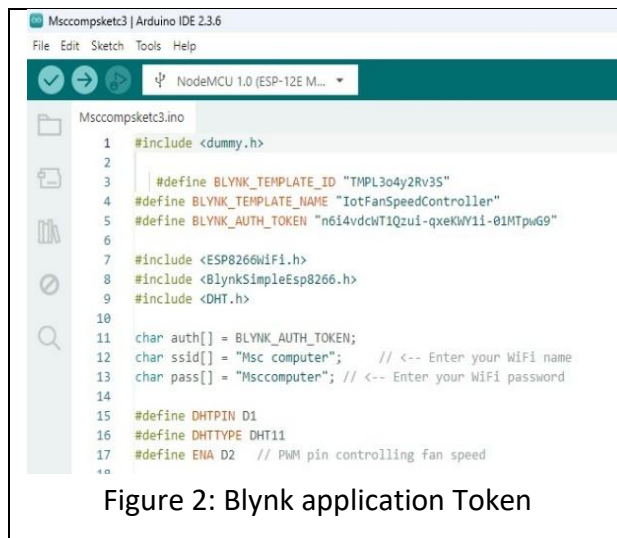
The proposed system is designed to monitor temperature and humidity using a DHT11 sensor and control a DC fan automatically through an ESP8266 Wi-Fi module and L298 motor driver. The system is powered by a suitable power supply unit. The ESP8266 Wi-Fi module acts as the main controller of the system. The DHT11 sensor is connected to the ESP8266 module and is responsible for sensing environmental parameters such as temperature and humidity. The sensor continuously measures these values and sends the digital data to the ESP8266 for processing.

Upon receiving the data from the DHT11 sensor, the ESP8266 analyses the temperature value. If the temperature exceeds a predefined threshold value, the ESP8266 generates a control signal. This control signal is sent to the L298 motor driver module, which acts as an interface between the low-power controller and the high-power load (DC fan).

The L298 motor driver receives the control signal from the ESP8266 and supplies the required 12V power to the DC fan. As a result, the DC fan turns ON when the temperature is high and when the temperature falls below the set limit, the ESP8266 stops sending the control signal, and the L298 motor driver turns OFF the DC fan.

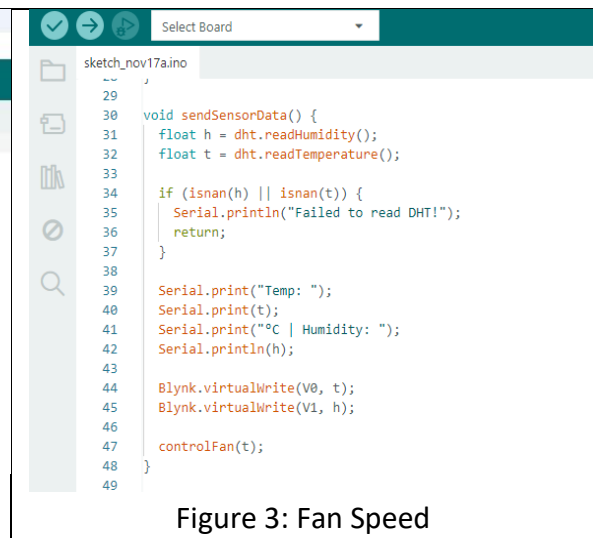
Software Requirement :

- **Arduino IDE coding**



```
Msccompsket3 | Arduino IDE 2.3.6
File Edit Sketch Tools Help
NodeMCU 1.0 (ESP-12E M...
Msccompsket3.ino
1 #include <dummy.h>
2
3 #define BLYNK_TEMPLATE_ID "TMPL3o4y2Rv35"
4 #define BLYNK_TEMPLATE_NAME "IotFanSpeedController"
5 #define BLYNK_AUTH_TOKEN "n614vdcwTIQzui-qxeKWY11-01MTPwG9"
6
7 #include <ESP8266WiFi.h>
8 #include <BlynkSimpleEsp8266.h>
9 #include <DHT.h>
10
11 char auth[] = BLYNK_AUTH_TOKEN;
12 char ssid[] = "Msc computer"; // <-- Enter your WiFi name
13 char pass[] = "Msccomputer"; // <-- Enter your WiFi password
14
15 #define DHTPIN D1
16 #define DHTTYPE DHT11
17 #define ENA D2 // PWM pin controlling fan speed
18
```

Figure 2: Blynk application Token



```
Select Board
sketch_nov17a.ino
29
30 void sendSensorData() {
31   float h = dht.readHumidity();
32   float t = dht.readTemperature();
33
34   if (isnan(h) || isnan(t)) {
35     Serial.println("Failed to read DHT!");
36     return;
37   }
38
39   Serial.print("Temp: ");
40   Serial.print(t);
41   Serial.print("°C | Humidity: ");
42   Serial.println(h);
43
44   Blynk.virtualWrite(V0, t);
45   Blynk.virtualWrite(V1, h);
46
47   controlFan(t);
48 }
49
```

Figure 3: Fan Speed

- **Blynk web dashboard**

Hardware Requirement :

- ESP8266 (Node MCU)
- Relay Module
- DC Fan (12v)
- Power Supply & Connecting Wires
- Motor Driver

Conclusion :

The IoT-based fan control system using ESP8266 and Blynk app allows the real time smart automated fan speed regulating system, controls as per the environmental conditions, remote control, saves energy, and improves convenience and user friendly. Remotely control through a smart phone application, it improves user convenience and allows fans to be operated from anywhere at any time. The system also helps save energy by exactly managing fan speed, reducing unnecessary electricity consumption. This concept gives directions to future researchers to apply the logic of the IoT in different areas as per the necessity. In the future, the system can be upgraded to manage multiple appliances, and form part of a complete smart home setup.

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