

DAFTAR PUSTAKA

- [1] E. Safrianti, L. Oktaviana Sari, and F. Wulandari, "IoT Applications in Fermented Tempe Production," 2022. [Online]. Available: <http://www.ijeepse.ejournal.unri.ac.id>
- [2] W. Agus, "Pengaruh Variasi Suhu Inkubasi Terhadap Waktu Pertumbuhan Rhizopus Oligosporus Pada Pembuatan Tempe Kedelai," vol.3, no.1, hlm., 37-4, Juni 2018...
- [3] I. Riadi and R. Syaefudin, "Monitoring and Control Food Temperature and Humidity using Internet of Things Based-on Microcontroller," *J. Ilm. Tek. El ektr Komput. dan Inform.*, vol. 7, no. 1, p. 108, Apr. 2021, doi: 10.26555/jiteki.v7i1.20213.
- [4] "Tempe: Persembahan Indonesia untuk Dunia," 2012. [Online]. Available: www.bsn.go.id
- [5] S. L. Suknia and T. P. D. Rahmani, "Proses Pembuatan Tempe Home Industry Berbahan Dasar Kedelai (*Glycine max* (L.) Merr) dan Kacang Merah (*Phaseolus vulgaris* L.) di Candiwesi, Salatiga," *Southeast Asian J. Islam. Educ.*, vol. 3, no. 1, pp. 59–76, Dec. 2020, doi: 10.21093/sajie.v3i1.2780.
- [6] A. Fitri Nuroctavia, A. Murtono, and B. Priyadi, "Sistem Kendali Suhu Dan Kelembapan Pada Proses Fermentasi Tempe Dengan Metode PID", doi: 10.33795/elkolind.v8i3/304.
- [7] P. Jamur, S. Organoleptik Dan Aktivitas Antioksidan, M. Astuti, M. HNE Soesatyo, F. Ilmu Keperawatan dan Kesehatan Universitas Muhammadiyah Semarang, and J. Kedung Mundu Raya no, "The Mold Growth, Organoleptic Properties and Antioxidant Activities of Black Soybean Tempe Fermented by Different Inoculums."
- [8] dan Purbandini, "Implementasi Teknologi Mikrokontroler Arduino Leonardo Pada Mesin Pembuat Tempe."
- [9] B. Darmawan, W. Pradiyanto, I. Made, B. Suksmadana, and S. Ch, "Prosiding SAINTEK RANCANG BANGUN ALAT PENGENDALI SUHU PADA FERMENTASI TEMPE BERBASIS MIKROKONTROLER," *LPPM Univ. Mataram*, vol. 4, 2022.
- [10] M. Hidayah, E. Prihartono, and B. Santoso, "Automatic Room Temperature Regulator for Making Tempe Based on Arduino with Fuzzy Logic Method," *J. Inf.*, p. 39, Feb. 2020, doi: 10.25139/inform.v3i2.1053.

- [11] D. Wijanarko, S. Hasanah, J. T. Informasi, and P. N. Jember, "MONITORING SUHU DAN KELEMBABAN MENGGUNAKAN SMS GATEWAY PADA PROSES FERMENTASI TEMPE SECARA OTOMATIS BERBASIS MIKROKONTROLER."
- [12] Jamaaluddin, "Rancang Bangun Alat Pengontrol Kelembaban Udara Pada Budidaya Jamur Menggunakan Arduino Uno dan Ultrasonic Mist Maker," *J-Eltrik*, vol. 2, no. 1, p. 46, Nov. 2021, doi: 10.30649/j-eltrik.v2i1.46.
- [13] "SISTEM APLIKASI LOGIKA FUZZY UNTUK PENENTUAN OPTIMASI RAGI TEMPE PADA PROSES FERMENTASI TEMPE KEDELAI MENGGUNAKAN METODE FUZZY MAMDANI (STUDI KASUS : PENGRAJIN TEMPE KEDELAI DESA BULU CINA) 1 ASPRINA BR SURBAKTI, 2 SHINTA PUTRI RAHAYU, 3 SINEK MEHULI BR PA, 4 RAHELIYA BR GINTING INSTITUT TEKNOLOGI DAN BISNIS INDONESIA," 2020.
- [14] A. Tahir, M. Anwar, H. Mubeen, and S. Raza, "Evaluation of Physicochemical and Nutritional Contents in Soybean Fermented Food Tempeh by *Rhizopus oligosporus*," *J. Adv. Biol. Biotechnol.*, vol. 17, no. 1, pp. 1–9, Feb. 2018, doi: 10.9734/jabb/2018/26770.
- [15] Putri Wahyuni Arnold, Pinondang Nainggolan, and Darwin Damanik, "Analisis Kelayakan Usaha dan Strategi Pengembangan Industri Kecil Tempe di Kelurahan Setia Negara Kecamatan Siantar Sitalasari," *J. Ekuilnomi*, vol. 2, no. 1, Sep. 2020, doi: 10.36985/ekuilnomi.v2i1.349.
- [16] H. Mukhoyaroh, S. Kesehatan, and Y. Merauke, "PENGARUH JENIS KEDELAI, WAKTU DAN SUHU PEMERAMAN TERHADAP KANDUNGAN PROTEIN TEMPE KEDELAI," 2015.
- [17] "Arduino® MEGA 2560 Rev3."
- [18] T. Liu, "Digital-output relative humidity & temperature sensor/module DHT22 (DHT22 also named as AM2302) Capacitive-type humidity and temperature module/sensor."
- [19] "NB-80E-01-H_Spec".
- [20] "Arduino® Nano."
- [21] "Mod-Dimmer-5A-4L".
- [22] "Handson Technology User Guide." [Online]. Available:

- www.handsontec.com
- [23] “1878245”.
- [24] D. A. Android *et al.*, “Rancang Bangun Alat Monitoring Daya Listrik Berbasis IoT Menggunakan Firebase.”
- [25] “LCD-016N002L1,” 2023. [Online]. Available: www.vishay.com

~ Halaman ini sengaja dikosongkan ~

LAMPIRAN A

Program Arduino

```
// dht
#include <DHT22.h>
DHT22 dht22(A0);
// lcd
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 16, 2);

// kipas
#define pin_blower 22
// mist
#define pin_mist 23

static float temp = 43;
static float range = 2;

void setup() {
  // serial
  Serial.begin(9600);
  Serial3.begin(9600);
  // lcd
  lcd.init();
  lcd.backlight();
  lcd.clear();

  // blower
  pinMode(pin_blower, OUTPUT);
  // mist
  pinMode(pin_mist, OUTPUT);
}

int lastT = 0;
int r = 0;

void loop() {
  float t = dht22.getTemperature();
```

```
float h = dht22.getHumidity();
```

```
if (t != h) {
```

```
    Serial.print(t);  
    Serial.print('\t');  
    Serial.print(h);  
    Serial.print('\t');
```

```
    lcd.setCursor(0, 0);
```

```
    switch (r) {
```

```
        case 0:
```

```
            lcd.print('|');
```

```
            break;
```

```
        case 1:
```

```
            lcd.print('/');
```

```
            break;
```

```
        case 2:
```

```
            lcd.print('-');
```

```
            break;
```

```
        case 3:
```

```
            lcd.print('|');
```

```
            break;
```

```
        case 4:
```

```
            lcd.print('/');
```

```
            break;
```

```
        case 5:
```

```
            lcd.print('-');
```

```
            break;
```

```
    }
```

```
    if (r < 5) {
```

```
        r++;
```

```
    } else {
```

```
        r = 0;
```

```
    }
```

```
    lcd.setCursor(1, 0);
```

```
    lcd.print("Temp  : ");
```

```
    lcd.print(t);
```

```

lcd.setCursor(1, 1);
lcd.print("Humidity: ");
lcd.print(h);

if (t > temp + 0.5) {
  digitalWrite(pin_blower, HIGH);
} else {
  digitalWrite(pin_blower, LOW);
}

if (h < 50) {
  digitalWrite(pin_mist, HIGH);
} else {
  digitalWrite(pin_mist, LOW);
}

int power = 0;
if (t < temp) {
  power = 98;
} else if (t > temp + range) {
  power = 1;
} else {
  power = mapFloat(t, temp, temp + range, 98, 1);
}
Serial.println(power);
Serial3.println(power);







delay(500);
}
}







float mapFloat(float x, float fromLow, float fromHigh, float toLow, float
toHigh) {
  return (x - fromLow) * (toHigh - toLow) / (fromHigh - fromLow) +
toLow;
}

```

LAMPIRAN B

Dokumentasi hasil Pengujian




Suhu	Kondisi Awal	Hasil
42°C		
43°C		
44°C		




45°C		
46°C		
47°C		



48°C		
49°C		

LAMPIRAN C

Dokumentasi Tampilan LCD

Suhu	Tampilan LCD
42°C	 <p>The LCD display shows the following text:</p> <pre>Suhu : 42.1 Kelembapan: 61.2</pre>
43°C	 <p>The LCD display shows the following text:</p> <pre> Temp : 43.50 Humidity: 49.90</pre>
44°C	 <p>The LCD display shows the following text:</p> <pre>-Temp : 44.70 Humidity: 53.40</pre>

<p>45°C</p>	 <p>The image shows a rectangular LCD display mounted on a metal plate. The display is blue and shows two lines of text: "Temp : 45.00" and "Humidity: 51.00". The display is secured with four screws. Above the display, there is a row of small, illegible characters.</p>
<p>46°C</p>	 <p>The image shows the same LCD display as in the first row. The display is blue and shows two lines of text: "Temp : 46.00" and "Humidity: 51.00". The display is secured with four screws. Above the display, there is a row of small, illegible characters.</p>
<p>47°C</p>	 <p>The image shows the same LCD display as in the previous rows. The display is blue and shows two lines of text: "Suhu : 47.9" and "Kelembapan: 60.2". The display is secured with four screws. Above the display, there is a row of small, illegible characters.</p>

48°C		 A photograph of a small LCD display mounted on a metal plate. The display shows two lines of text: "Suhu : 48.0" and "Kelembapan: 59.0". The background of the display is black, and the text is white.	
49°C		 A photograph of a small LCD display mounted on a metal plate. The display shows two lines of text: "Suhu : 49.2" and "Kelembapan: 61.6". The background of the display is black, and the text is white.	

BIODATA PENULIS



Nama : Izmi Dyah Setia Arum
Tempat, Tanggal, Lahir : Cilacap, 12 Desember 2002
Alamat : Jl. ML.Wiratno no.18, Cilacap.
Email : izmidya@gmail.com
Telepon/HP : 081215789731
Hobi : Jalan-jalan
Motto : Allah bersama prasangka hamba-Nya
Riwayat Pendidikan :

- SD Negeri Sidakaya 03 Cilacap Tahun 2008-2014
- SMP Negeri 3 Cilacap Tahun 2014-2017
- SMK Negeri 1 Cilacap Tahun 2017-2020
- Politeknik Negeri Cilacap Tahun 2020-2923
Prodi D3 Teknik Elektronika

Penulis telah mengikuti Seminar Tugas Akhir pada tanggal 3 Agustus 2023 sebagai salah satu persyaratan untuk memperoleh gelah Ahli Madya (A.Md.).