

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Literature Study

The author wants to use gas sensors MQ-2 (methane), MQ-7 (CO), and MQ-135 (CO₂) as analog inputs based on the findings of a series of journals with the theme of air quality. As an output, a 16x2 LCD, three LEDs (Red, Yellow, and Green), and a buzzer are used. The author uses fuzzy logic algorithms to categorize the outputs of three inputs into a single output. The authors of this study have three categories for assessing air quality: Good Quality, Mid Quality, and Bad Quality. The LED turns green, the LCD displays GOOD QUALITY, and the buzzer is silent when the category is good quality. The LED will be yellow, the LCD will read MID QUALITY, and the buzzer will be silent if the quality is mid. However, if bad quality, the LED turns red, the LCD shows BAD QUALITY, and the buzzer sounds.

3.2. Collecting Data

This study included data from a variety of gas levels, including testing with methane gas, carbon monoxide gas, and carbon dioxide gas, as well as testing both indoors and outdoors. The goal of this test is to see if the tool/sensor is operating appropriately.

3.3. Implementation Programs

Sensor air quality: MQ-2(metane), MQ-7(CO), MQ-135(CO₂).

References:

1. Air Pollution Standard Index (ISPU) Table.
2. Clean Air Composition Table.
3. Clean Air and Polluted Air Table.
4. The MQUnifiedSensor library was used.
5. The LCD I2C library was used.

A program was generated and uploaded using an Arduino ATmega 2560. Sensors MQ-2(Metane/LPG), MQ-7(CO), MQ-135(CO₂) as input to detect the presence of hazardous gases in

accordance with what has been determined and in the form of units PPM, then the input data will be processed using a fuzzy logic algorithm with 27 rules to detect the presence of hazardous gases in accordance with what has been determined and in the form of units PPM.

3.4. Testing

To get data for this study, the following and sensors were tested:

1. In a room with good air circulation.
2. Outside the room.
3. Inserting LPG gas into plastic for testing.
4. Insert the smoke mosquito coil into the plastic as soon as feasible to conduct the test.
5. Putting diesel vehicle emissions into plastic for testing.

3.5. Analysis

In a study titled Monitoring Of Air Quality Using A Fuzzy Algorithm, researchers looked at whether the surrounding air includes chemicals that are hazardous to living creatures health and calculated how much of the hazardous gas content is around the system programs.

