UNIVERSITI TEKNOLOGI MARA

REAL-TIME AIR QUALITY MONITORING SYSTEM IN RESIDENTIALS USING ARDUINO UNO WI-FI

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ABSTRACT

In recent times, the significance of air quality surrounding residential areas has been declining rapidly, which in turn may cause severe long-term effects to residential's health. If said problem is not adequately addressed, uninformed residents may be subjected to coughing or itchy eyes that may cause or worsen a variety of lung and respiratory illnesses, which can result in hospitalizations, cancer, or even premature death. With this inspiration, this thesis presents an air quality monitoring system by using an Arduino Uno Wi-fi as a microcontroller, the system detects the air pollutants in the air and converts it into units of Part Per Million which can be used to evaluate the conditions of the air quality in the surroundings. Readings from the sensors will then be sent to an online application, Blynk, to view air quality conditions. Thus, it is essential to keep track of the air quality by referring to Malaysia's air quality index especially in residential areas as the air quality can heavily impact a person's health. Environmental data monitoring is beneficial for many purposes. However, accessibility of the monitored data could be challenging due to factors such as time, cost, and energy.

ACKNOWLEDGEMENT

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INTRODUCTION

1.1   Research Background

Poor air quality is the result of the presence of extra unwanted biological molecules, particulates, or other harmful things into the earth's atmosphere. It is a major cause of infections, allergies, and eventually reasons of death to some peoples [2]. The world health organization (WHO) in 2014 approximated that 7 million people deaths worldwide because of air pollution. The similar approximation roughly equalled by the International Energy Agency (IEA) also [2] . The negative effects of poor air quality can be seen on people but also ecosystems. Poor air quality can contribute to the depletion of the ozone layer and acid rain [3]. The amount of waste produced in our country has increased in recent years.

The rapid increase of population has resulted in an increase in solid garbage waste. The possible effects of this growing garbage problem on air quality are one of the less studied aspects of it. Numerous contaminants can be released into the atmosphere by improper disposal methods such as open burning and poor landfill management. These pollutants, which include gases, volatile organic compounds, and particulate matter, could lower air quality, and endanger human health.

Moving on, the existing air quality monitoring systems often lack the ability to provide information on air quality levels in residential areas. Thus, limiting the resident's knowledge of their surrounding's air quality, which in turn prevents people from taking necessary actions to reduce exposure to poor air quality. In addition, if said problem is not to be taken care of, then this may prevent the identification of the source of poor air quality of the area, which in turn can impede future for improving the air quality in the residential area. Although similar research has dived the utilization of IoT-based air quality monitoring systems, scant few concentrate on residential areas. There is a need for a comprehensive study that specifically investigates and develops an IoT-based air quality monitoring system for residential settings.