

ABSTRACT

Air pollution is a condition in which air quality is damaged and contaminated either by harmful or harmless substances to living things. The main problem with the air quality measurement system in the field is the inaccuracy. This is due to the system installation is installed in an area where there is a lot of traffic pollution. This thesis created an alternative method to measure air quality using overground measurements. This thesis invented an Air Quality Measurement Device Using Programmable Quadcopter Drone Towards Swarm-IoT (Internet of Things). With this alternative, Swarm-IoT drone can measure air quality above ground level.

In this thesis, measurement of air quality using the MQ-135 sensor with a value range of 10 - 10000 ppm. Measurement of temperature and humidity using the DHT22 sensor. The working temperature is $-40^{\circ}\text{C} + 80^{\circ}\text{C}$ and the humidity range is from 0-100%. The temperature has an accuracy of 0.5°C , and the humidity, 2%. NodeMCU as a microcontroller. Data obtained from the sensor processed in NodeMCU and the database's data over a Wi-Fi network displayed on Android. With these components, drones can measure air quality at an altitude of 0m, 3m and 5m.

The results denoted that the quadcopter can automatically detect air quality. Measurements of the data were viewed directly via a smartphone in real-time. Air quality testing was carried out in two places, namely GSG and Ciganitri field. The tests were done to determine the value of good air quality. The findings showed that good air quality was below the range of 720, and the worst was above 780. The average air quality results at the GSG at an altitude of 0m was 396, at an altitude of 3m was 389, and at an altitude of 5m was 387. While in the Ciganitri field, the average of air quality at an altitude of 0m was 695, at an altitude of 3m was 696, and at an altitude of 5m was 694. The deviation value of temperature measurement using a digital thermometer as a reference to obtain a value of 1.8 indicated that the measurement results using a sensor test device were close to accurate results.

Keywords: IoT, Sensors, Drone, Air Quality