

Pengembangan Urban Air Quality Monitoring System Berbasis Internet of Things = Development of Urban Air Quality Monitoring System Based on Internet of Things.

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Abstrak

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Meningkatnya kasus ISPA di Indonesia pada bulan agustus 2019 menjadi dua kali lipat dibanding bulan-bulan sebelumnya ternyata sejalan dengan meningkatnya konsentrasi PM10 dan PM2.5. Akibatnya informasi kualitas udara semakin dibutuhkan oleh masyarakat namun keterbatasan alat membuat informasi kualitas udara yang dikeluarkan BMKG maupun Kementerian Lingkungan Hidup hanya meliputi beberapa titik saja. Oleh karena itu dibutuhkan alat pemantau kualitas udara yang low-cost dan dapat dipasang diberbagai titik agar data kualitas udara kedepannya semakin rapat serta menjamin tersedianya back up data saat alat utama mengalami gangguan. Pemanfaatan mikrokontroller arduino mega 2560 dan sensor laser dust ZH03A pembaca PM10 dan PM2.5 outdoor yang dapat diperoleh di pasaran adalah solusi alternatif tersedianya alat pengamatan kualitas udara yang dibutuhkan BMKG dan instansi terkait. Permasalahan selanjutnya mengenai bagaimana mendapatkan data secara online dan real-time diatasi dengan menggunakan prinsip Internet of Things. Alat yang dirancang juga dilengkapi dengan prediksi PM2.5 dan PM10 menggunakan prinsip jaringan syaraf tiruan. Penelitian ini menunjukkan bahwa sensor laser dust ZH03 memiliki korelasi sebesar 0.511 dan 0.877. Prediksi PM2.5 dan PM10 mampu ditampilkan melalui aplikasi dengan akurasi diatas 50%.

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ABSTRACT

The increase of ARI cases in Indonesia in August 2019 has doubled compared to the previous months in line with the increasing concentration of PM10 and PM2.5. As a result, air quality information is increasingly needed by the public, but the limited means of making air quality information issued by BMKG and the Ministry of Environment only cover a few points. Therefore, we need a low-cost air quality monitoring tool that can be installed at various points so that air quality data in the future is getting tighter and guarantees the availability of back up data when the main equipment is interrupted. The use of arduino mega 2560 microcontroller and ZH03A laser dust sensor as PM10 and PM2.5 outdoor readers that can be obtained on the market is an alternative solution to the availability of air quality monitoring equipment needed by BMKG and related agencies. The next problem regarding how to get data online and in real-time is overcome by using the principle of the Internet of Things. The designed tool is also equipped with PM2.5 and PM10 predictions using the principle of artificial neural networks. This study shows that the ZH03 laser dust sensor has a correlation of 0.511 and 0.877. Prediction PM2.5 and PM10 can be displayed through the application with an accuracy above 50%.