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INVESTIGATIONS ON DETECTION AND FILTERING OF INDOOR AIR POLLUTANTS EMPLOYING COST-EFFECTIVE CONTROLLER FOR ASTHMA MANAGEMENT

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Abstract

Technology has succeeded in bringing work and learning to the drawing rooms of common man. With increasing students and employees learning and working out of their homes, focus now has shifted to keep indoors clean and healthy. The reality is quite opposite with pollutant concentrations found higher indoors relative to world outside. Asthma, chronic disease, has seen an exponential spread due to circulating air contaminants from the chalk usage and building products. The goal of this study is to lessen or get rid of pollutants so as to improve the health of patients affected with Asthma. Hence, it is necessary to monitor and measure indoor air pollutants closely on a real-time basis. In spite of different air filters available to remove indoor air pollutants, they do not simultaneously absorb NO₂, CO, and PM. The design of an affordable air quality monitoring and filtration system to identify and measure these contaminants is presented in this paper using a data-driven approach. This gadget provides real-time data in terms of g/m³ while continuously monitoring the concentration of these pollutants at various interior locations. The average AQI value is then computed and compared with the threshold limit given by World Health Organization (WHO). Filtering action is initiated when the value exceeds and this helps the range within the typical condition. To identify the best spot to upgrade the air quality, a prototype AQMF model with an Arduino UNO Controller is tested at several locations in the chosen room. Experimental results show that the proposed strategy offers a simple preventive strategy that could lower inhaler usage and, consequently, its associated costs.

Keywords: air quality index, air quality monitoring and filter, Arduino UNO, asthma management, indoor air pollutants, sensors

Received: August, 2022; Revised final: December, 2022; Accepted: December, 2022; Published in final edited form: January, 2023

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