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| **Title:** | Portable Air Quality Detector Using DSM501A Dust Sensor and Arduino Uno | | |
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| **Published Journal Name:** | Journal of Engineering Research and Reports | | |
| **Type of Publication:** | Journal | | |
| **Volume:** | 26 | Issue | 3 |
| **Publisher:** | Science Domain International (SDI) | | |
| **Publication Date:** | 12 April 2024 | | |
| **ISSN:** | 2582-2926 | | |
| **DOI:** | https://doi.org/10.9734/jerr/2024/v26i51143 | | |
| **URL:** | https://journaljerr.com/index.php/JERR/article/view/1143 | | |
| **Other Related Info:** | pp. 163-174 | | |
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| **Abstract:** |  |
| Aims: The primary feature of this research is to design a circuit that can analyze the air around the system and determine the quality of the air.  Study Design: This paper reports on the design and implementation of a portable air pollution analyzer using Arduino Uno, DSM501A dust sensor, LCD, switches, buzzer, and multiple LEDs. The air pollution analyzer system was designed using a combination of hardware and software techniques to measure air pollution properly.  Place and Period of Study: The research was accomplished by the authors in a group of two students under the grasp of a professor as a part of one of his course capstone projects for the Bachelor of Science in Electrical and Electronic Engineering degree at the American International University Bangladesh (AIUB), Dhaka, Bangladesh. The authors performed their investigative tasks at AIUB from September 2023 to February 2024.  Methodology: The air pollution analyzer was implemented using an Arduino Uno and dust sensor to generate and determine accurate air quality based on specific air contents. The system that was developed used a PM10 detection system that identified the amount of dust particles in the area. Based on PM10 readings, the air quality was identified. Moreover, the Air Quality Index (AQI) was determined using the PM10 readings. The LCD, buzzer, and multiple LEDs were used to display and indicate the air quality condition and levels.  Results: The portable air pollution analyzer was successfully tested and found to be accurate and reliable in determining air quality. To indicate different hazardous states of air, red, green, and yellow color LEDs are used. The test outcomes were very satisfactory.  Conclusion: This system demonstrates the use of a microcontroller in building a simple yet effective portable air quality detector. It can be scaled up for commercial production. | |