Low-Cost Portable IoT Based Air Purifying Ventilation System Operated by PPM Value Present in Environment

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Abstract:
The significant impacts of Indoor Air Quality (IAQ) on occupant health and well-being led to the development of an innovative ventilation and air quality control system. This system combines temperature and humidity sensors with gas sensors like MQ-135, MQ-7, MQ5, and MQ-2 to constantly monitor carbon dioxide, volatile organic compounds, and carbon monoxide concentrations. It is specifically operated based on Parts-Per-Million (PPM) levels of pollutants in the environment. Through the use of intelligent algorithms and a microcontroller-based control unit, dynamic ventilation changes and filter activation are made possible by real-time data on PPM levels. Through the removal of airborne particles, the reduction of respiratory hazards, and the improvement of interior comfort and productivity, High Efficiency Particulate Air (HEPA) filtration technology further improves air quality. To simulate real-world interior environments, experimental testing was carried out in a 140 -square-foot conference room with ten to twelve participants. Findings show that our system is successful in keeping indoor air quality within established parameters and norms, underscoring the system's potential for broad use in a variety of indoor contexts.

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