

Enhancing Mining Industry Safety and Air Quality Through IoT-Based Monitoring and Air Purification System

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Abstract: *The mining industry is very concerned about industrial safety. For workers to be safe and productive, communication and healthcare are essential. To monitor and react to potential dangers, reliable communication is essential, while medical personal protective equipment and examinations are crucial. The mining industry has to improve safety measures because the existing safety systems have flaws. To minimize dangers and safeguard workers, the mining industry uses safety systems like ventilation, emergency response plans, and gas monitoring. Fresh air is provided via ventilation, dangerous gasses are detected by gas monitoring, and accidents are reduced by emergency action procedures. These systems have drawbacks, including the inability to detect all gasses, insufficient airflow, and a limited ability to reduce accidents. Therefore, these systems need to be improved. By enhancing communication and utilizing the IoT (Internet of Things) to monitor air quality, toxicity, and workers' vital signs, our solution increases safety in the mining industry. Real-time monitoring and reporting of dangers is made possible via sensors, an esp32 board, and the blynk software. Monitoring vital signs ensures workers' health, while the method seeks to raise productivity in the mining sector. Our suggested system significantly contributes to improving safety in the mining industry by utilizing cutting-edge technology and creative solutions.*

Keywords: ESP32, Air quality detection, Air purifier, Blynk, IoT

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