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Smart Wearable Suit for Coal Miners using LORA Module

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Abstract: *This paper presents a comprehensive study on the mining industry has always been considered one of the most hazardous industries, with coal mining being particularly dangerous due to the risks of explosions, cave-ins, and exposure to toxic gases. As a result, ensuring the safety of miners has always been a top priority for mining companies. In recent years, there have been significant advances in wearable technology, leading to the development of smart safety suit that can enhance the safety of coal miners. In conclusion, the smart safety suit for coal miners represents a significant advance in mining safety technology. By providing real-time data on potential safety risks, it can help miners and safety personnel to make more informed decisions and take proactive steps to mitigate risks. Ultimately, this technology has the potential to reduce accidents and injuries in the mining industry, leading to a safer and more productive workplace for miners. The mining industry, essential for global resource supply, poses significant health and safety risks to workers, particularly in underground environments. This project presents the development of an intelligent safety monitoring system specifically designed for coal miners, aimed at enhancing their safety and well-being. The proposed system integrates advanced sensor technologies within a wearable coat to continuously monitor critical environmental parameters such as humidity, temperature, and concentrations of hazardous gases, alongside real-time health metrics like heart rate. Utilizing LoRa (Long Range) communication technology, the system enables seamless data transmission to a central control station, facilitating immediate alerts and two-way communication. This real- time monitoring allows for the rapid identification of hazardous conditions, enabling timely interventions to mitigate risks. The integration of these technologies promotes proactive safety management, significantly reducing the potential for accidents and health issues.*

Keywords: Wearable Technology, Mine Safety , Sensor Integration , Real-time Monitoring.

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