# Patent Search

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Inventor

| Name | Address | Country | Nat |
|---|---|---|---|
| Jowdula Chandra Sekhar | Assistant Professor, Dept. of Mechanical Engineering, Vishnu Institute of Technology, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh 534202 | India | Indi |
| Ramu Inala | Professor, Dept. of Mechanical Engineering, Vishnu Institute of Technology, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh 534202 | India | Indi |
| Nimmala V V Manikanta | Assistant Professor, Dept. of Mechanical Engineering, Vishnu Institute of Technology, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh 534202 | India | Indi |
| Venu Mangam | Professor, Dept. of Mechanical Engineering, Vishnu Institute of Technology, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh 534202 | India | Indi |
| Karri V G Rama Seshu | Associate Professor, Dept. of Mechanical Engineering, Vishnu Institute of Technology, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh 534202 | India | Indi |

Applicant

| Name | Address | Country | Nation |
|---|---|---|---|
| Vishnu Institute of Technology | Sri Vishnu Education Society, Kovvada Rd, Vishnupur, Kovvada, Andhra Pradesh 534202 | India | India |

**Abstract:**

The present invention relates to an IoT-enabled smart safety helmet configured to enhance worker protection in mining and industrial environments through continuous environmental monitoring and real-time location tracking. The helmet integrates a multi-gas sensor, temperature and humidity sensor, and ambient-light sensor coupled t microcontroller that evaluates sensed parameters against predefined safety thresholds. A GPS/Wi-Fi module determines worker location, while an IoT communication inte transmits sensor data and emergency alerts to a remote monitoring system. A local alerting unit provides immediate audible, visual, or vibratory warnings, and an emerge mechanism allows manual or automatic distress signaling. Powered by a rechargeable supply and housed within a rugged protective shell, the system offers proactive, autonomous, and reliable safety monitoring in hazardous conditions.

Complete Specification

Description:FIELD OF THE INVENTION

[001] The present invention relates to the field of occupational safety and industrial hazard-monitoring systems, particularly those employing Internet of Things (IoT) technologies for real-time sensing and communication. More specifically, the invention concerns an intelligent, wearable safety helmet integrated with environmental sensing modules, including multi-gas detectors, temperature and humidity sensors, and ambient-light sensors, together with GPS and Wi-Fi–based geolocation capabiliti for continuous tracking of personnel in hazardous environments. The invention further pertains to automated alerting mechanisms, remote supervisory monitoring, anc emergency-signaling features designed to enhance worker protection in high-risk sectors such as mining, oil and gas, chemical plants, construction sites, and other industrial facilities where exposure to toxic gases, restricted visibility, and communication delays pose significant dangers.

BACKGROUND OF THE INVENTION

[002] Mining, construction, oil and gas exploration, and other heavy industrial activities expose workers to a multitude of environmental hazards, including toxic and combustible gases, oxygen-deficient atmospheres, extreme temperatures, poor illumination, and physically unstable working zones. Conventional safety practices in suc industries continue to rely heavily on manual supervision, periodic site inspections, and handheld instruments for gas monitoring and location tracking. These methods a inherently limited, as they depend on worker attentiveness, supervisor availability, and uninterrupted communication channels. In high-risk industrial scenarios, the time

View Application Status

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