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Design of Safety Tracking Device for Worker's Safety And Monitoring

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ABSTRACT

Safety Tracking is the process of tracing a person's ware bouts and their vitals and health in case of an emergency or accident. A device which sends or saves this data is considered as a safety tracking device. This device may help multiple sensors attached to the device itself or attached to the person there by reading and sending their ware boats and data within the parameter of the workspace in a company to a live supervisor or data storage so that it can be reviewed in case an accident occurs. This data can be used to study any accidents involving that person and device preventive measures of that accident again. The novel system can acquire the real-time working condition information of faculties such as pipe flow, pressure, temperature, humidity of the environment, current & voltage of the electrical equipment, valve switch, relay action, alarming message it can upload the collected data to the monitoring center to the client/server architecture. Based on these data, an electrical early warning model depending on the change in surroundings based on neural work is proposed. A personal safety evaluation model based on ontology with the usage of protege is established, which facilitate the on-line monitoring and control of building fire protection information, the prediction of accidents and improve building safety level evaluation.

Keywords: Safety Tracking, Industrial Environment.

I. INTRODUCTION

In some industries, such as mining and heavy industry, safety is paramount given fast turnaround times, diverse skill sets, and hazardous working conditions. Worker Safety Monitoring solution addresses safety needs by providing end-to-end safety monitoring and management capabilities. The solution includes safety equipment lifecycle management, safety clearances, behavioural monitoring, workplace conditions and worker monitoring. The solution is based on precise geotechnical design and AI evaluation, covering a wide range of scenarios. Remote Work, Mining Operations, and Hazardous Environments. The solution also

monitors worker health and ensures compliance with safety guidelines.

A UK Safety Council study found that nearly 80% of workers work in hazardous environments, with 20 times more deaths on site in India than in the UK. About 48,000 workers have died in the country due to occupational accidents, 24.2% of them in the construction industry. Since most workers are at the bottom of the social pyramid, injuries and associated expenses add to the financial burden and negatively impact quality of life. All these facts urgently require better occupational health and safety systems and risk assessment techniques at all construction sites.

By innovating automated industrial safety monitoring systems that monitor workers' safety in real time and instantly alert the stakeholders upon threat detection. is not only enabling the digital empowerment of the construction sector but also assuring the safety of workers for a better Quality of Life. Traditional safety management methods such as risk analysis and safety training have proven ineffective for construction safety. Recognizing the important role of occupational safety equipment in minimizing the risk of injury, most industries employ industrial safety monitoring systems to ensure compliance. However, most of these systems suffer from problems that cast doubt on their effectiveness.

II. METHODS AND MATERIAL

The main intent of this project is to design and bring about a robot prototype by using.

- Arduino
- Pulse Sensor
- LCD Display
- Thermistor
- Temperature sensor
- Wireless Module (ESP8266)
- Gyro and Accelerometer Sensor

III. RESULTS AND DISCUSSION

The Device was assembled and through daily use and testing it is found that it has more benefits that not using them at all. We will discuss about the parts that has been used.

A. Arduino Pro Mini 328

The Arduino microcontroller is pre-programmed with a bootloader that allows you to easily upload your program to the on-chip flash memory. The Arduino UNO's default bootloader is his Opti boot bootloader. The board is loaded with program code via a serial connection to another computer. Some Arduino serial boards contain level shifter circuitry to convert between RS-232 logic levels and Transistor-to-Transistor Logic (TTL) signals. Modern Arduino boards are programmed via Universal Serial Bus (USB) implemented with a USB-to-Serial adapter chip such as the FTDI FT232. Some later boards such as the Uno board replace the FTDI chip with another AVR chip containing USB-to-Serial firmware that is reprogrammable via its own ICSP header. Other variations such as the Arduino Mini and the unofficial Boarding use detachable USB-to-serial adapter boards or cables, Bluetooth, or other methods. Uses standard AVR In-System Programming (ISP) programming instead of the Arduino IDE when used with traditional microcontroller tools. Official Arduino Uno R2 with I/O location descriptions.

B. Pulse Sensor

Pulse Sensor Amped is a plug-and-play heart-rate sensor for Arduino and Arduino compatibles Pulse Sensor adds amplification and noise cancellation circuitry to the hardware. It's noticeably faster and easier to get reliable pulse readings. Pulse Sensor Amped works with either a 3V or 5V Arduino

C. Thermistor

Pairing this with the pulse sensor, we can pre identify if a personal is suffering any heat stroke while on the

job or any irregularities that might cause serious harm to the personal.

D. ESP8266

The prototyping hardware typically used is a circuit board functioning as a dual in-line package (DIP) which integrates a USB controller with a smaller surface-mounted board containing the MCU and antenna. The choice of the DIP format allows for easy prototyping on breadboards. The design was initially based on the ESP-12 module of the ESP8266, which is a Wi-Fi SoC integrated with a Ten silica Xtensa LX106 core, widely used in IoT applications

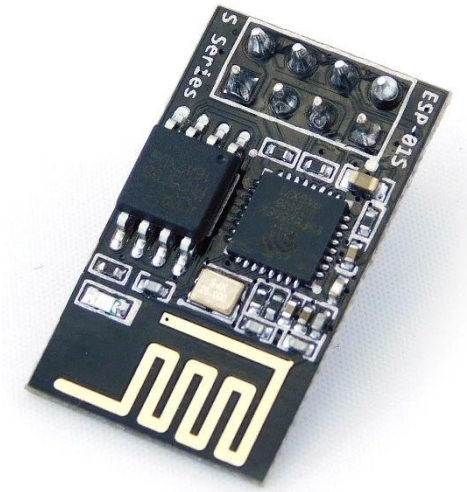

Figure 1: ESP Wi-Fi module

E. Advantages

- Safety and security for the Workers.
- User friendly app
- Real time monitoring system
- Low power consumption.
- Can allow freer movement for operator.
- When the capacitance field is disturbed by any part of the operator's body during the cycling process, immediate machine breaking is activated.
- A detailed data can be sent for study in case of a failure in the guarding system

IV.CONCLUSION

The safety detection systems proposed in the literature served as useful information in the safety awareness of workers with no safety system. Thus, this study considers the existing issues and build an efficient and effective fire detection system based on IoT technology, gas, and temperature sensor to collect the data accurately and rapidly. The continuous readings sent over WIFI modules to the central unit to analyze the data and trigger when there is any abnormality in the environment of the worker. This system structure enhances the efficiency and effectiveness of monitoring the workers. Moreover, using the Ubidots platform in this system made the data exchange faster and reliable. However, this study's proposed approach obtained an average response only within the vicinity of the industry and workspace. Hence, the proposed system overcame the challenges of the issues of affordability, effectiveness, and responsiveness. The proposed system still needs further enhancements. Thus, one of the enhancement directions is integrating machine learning with the system to predict the potentiality of an incident on the collected data from different sources. Machine learning may help the operators find and overcome the vulnerabilities in their building to prevent fire instead of detection only.

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