A REVIEW PAPER ON IOT BASED MINING & WORKER SAFETY HELMET

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Abstract-

:Mining is major requirement to the creation of goods, infrastructure and services which helps the quality , secure and protection of their lives. Working under the earth is much danger for human health and also for life . Frequently the underground environment is much dangerous as lot of earth quakes and tsunamis occur which is very danger to the life . The mines that are deeper are more n more dangerous when ongoing job for mining employees . So here we propose a mining tracking system as well as safety system for the mining industry using microcontroller-based circuit on the worker helmet . There is location-based miners environment mapping using smart helmet. Moreover, each worker helmet circuit is integrated with a panic/emergency button. This button when pressed shows an emergency sign over the IOT web interface about the worker emergency. This can be used for any emergencies like – toxic gas inhalation, cave ins, physical injury etc. Thus, the system ensures mining worker safety using IOT.

Keywords – Mining Tracking, Smart helmet, IOT Interface.

1.INTRODUCTION

The idea of this project is to give information about the mishap in the underground mines to the ground team which monitors all the activity, so we chose IoT technology to give the information by the means of webserver. We are using Arduino ESP 8266 microcontroller as the heart of the project. Showing the stats alone can't help the ground team to locate the miner in case of any accident. So, we included GPS location in the website which we are displaying so that the help team will have perfect information .About where and when the accident may occur. For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values using which we can find the accurate position of the accident place. To run the GPS, we use Arduino ESP 8266 board which has Tensilica L106 32-bit RISC processor. The Arduino is a very user-friendly device which can be easily interfaced with any sensors or modules and is very compact in size. Now we are clear that the Arduino will send the alert the team using the IOT based website by keeping the GPS location on the screen which is obtained from the GPS module. But when should all this be done? When accident occurs, how will the Arduino detect the accident? We use a panic button which when pressed will alert the ground team and let them know that they are in need of help.
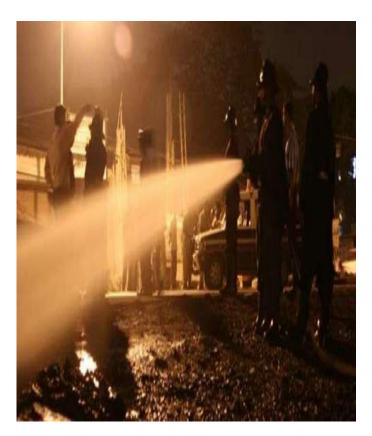
Fig 1.1 Fire due to gas leak in coal mines

Keeping the extreme conditions of mine in mind we have also added temperature, humidity, air quality sensor and infrared sensor. Also, there is buzzer which will help indicate any extreme conditions to the miner thereby helping him take further steps.   IOT mining helmet is a very needed and very helpful for the underground miners, as well as for few other purposes. It can also be modified as biking helmet. This helmet can save many lives. There around 700 deaths in the past year due to the accidents in mines, this could be solved by using this smart IOT helmet.

2.LITERATURE OF REVIEW

I. Implementation of Smart Safety Helmet foe Coal Mine Workers

This paper presents execution of security cap for coal excavators. This protective cap is furnished with methane and carbon monoxide gas sensor. This sensor sense the gas and the information is transmitted to the control room remotely, through a remote module called Wifi module associated with the head protector. At the point when the methane or carbon-monoxide gas focus is past the basic level, controller in the control room triggers a caution and guards the plant and the laborers by keeping an up and coming mishap.

II .IoT based Smart Helmet for Coal Miners

In this paper, a fiscally sharp iot based smart helmet for Coal miners.In this paper I tells about iot based helmet for coal miners. This project is very importance for mine workers it is very useful for the smart project. In this project we used many sensors for sense the gas and any other things.In this system we use a LCD display to show the output of coal miners that are work underground.

III .Proposed System

The system we propose makes use of external wearable device for convenience of the miners.. Unlike the existing systems that uses a helmet which might put the miner in risk at the time of short circuit and effect the brain. Arduin is used which has good set of pins for sensors. It is also very less power consuming NRF is used for wireless communication of the data. RFID is used for the tracking of the person.

3. CONCLUSION

We have developed a smart helmet to help workers to get rid of hazardous events in mining such as humidity and temperature condition and existence of combustible gases. Significance of each block has been resonated out and placed carefully, thus contributing to the best working of the unit. Heart of the system is Arduino which controls and monitors these events using IOT. This system is displaying the parameters on the base station PC and alerting miner, from base station higher authority can monitor everything and provides rescue operation for the miner. Alarm triggers when sensor values cross the threshold level. As we are storing the values of

the parameters like temperature, humidity in the PC, the stored values can be used to detect the hazards before the lost happens . As we are giving the information to the personnel regarding the measures to be taken in case of a hazard, it will be useful for them to save their life before any one comes and help them to come out of the mine. It also provides a technique for tracking the position of the worker which enables the Prescue team to provide immediate help in adverse conditions. Hence the system is reliable with simple and easily available components, making it light weight.

4. ACKNOWLEDGEMENTS

5. REFERENCES

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2. Pranajl Hazarika, "Implementation of safety helmet for coal mine workers", 1st IEEE International Conferences on Power Electronics Intelligent Control and Energy System, pp.1-3, 2016. It did not have panic button and pressure sensor.

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6. Authors Biography

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