HUMAN SECURITY IN MINING SYSTEM USING IOT

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Abstract: Over the past few years the transition of the Internet of Things (IoT) from research into its theory towards its practical application in our daily lives have been witnessed. It provides a mechanism for analysing both real-time data and past data, in which emerging artificial intelligence and data mining techniques play a key role. Although there is an increasing interest in applying the IoT in healthcare applications, there are still many challenges, such as finding 'kits' of IoT devices that could properly monitor a patient's activity and track certain symptoms. Mining security means sensors information updates to web server using GPRS communication using TCP/IP and HTTP protocols. Now a day's Many real time applications connected to web(internet).This is very use full and help full for customers to see application(requirements) from anywhere in the world. These web connected applications are belongs to server client relation. TCP, UDP and HTTP protocols are used in this concept. Data transfer to web server through GPRS (General packet radio services) communication. We can transfer long data through this GPRS.

***Index Terms* – Mining, Sensor Networks, Arduino, IoT, Webserver, PC**

1.INTRODUCTION

Data logger means which system store and pass from source to destination is called as data logger. Here sensors data logger means microcontroller consists of some digital and analog sensors. Whenever these sensors activated or found sense microcontroller get information from sensors and develop TCP/IP stack with standard format. Data can appear on LCD display.GSM/GPRS modem pass this TCP/IP stack to web server through Particular IP address and port number. Web server maintain data base of all sensors with respective to time interval. Our web server supports more than ten sensors. User could connect different type of sensors like fire, smoke etc. But user/costumer select any four or five sensors due to cost effectiveness.

Proposed work uses 8051 as a microcontroller with 5v DC Power supply. Serial (UART) protocol is primary concern here. The main heart of these projects is GSM/GPRS modem and it work on GPRS AT commands. 16X2 lcd is connected to microcontroller through Digital I/O lines. Sensors connected to microcontroller through digital I/O lines or analog. In this we are using IR and GAS sensors. Whenever the person enter into the mines that information is send to the server and any poisonous gas is occurred that information is also send to the server by using HTTP commands.

1.1 Operation of ARDUINO:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards. The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC

adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5Vpin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts

The power pins are as follows: ·

- VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.·
- 5V. The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.
- 3.3V.A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

1.2. ARDUINO UNO BOARD:

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

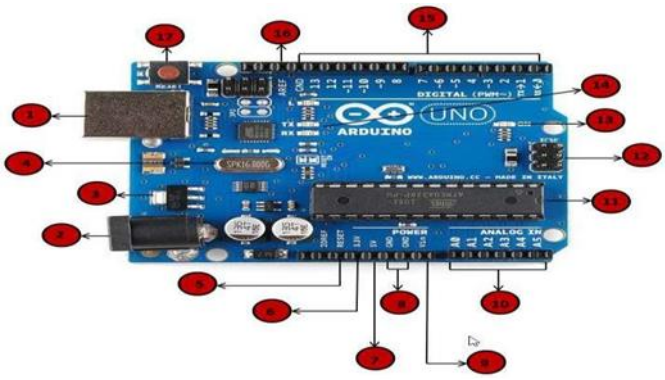


Figure 1.2: Arduino Uno board

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converters.

1.3. Implementation of sensors:

1. FIRE SENSOR: The Fire sensor, as the name suggests, is used as a simple and compact device for protection against fire. The module makes use of IR sensor and comparator to detect fire up to a range.

2. Vibration sensor: These spring-vibration switches are high sensitivity non-directional vibration induced trigger switches. Inside is a very soft spring coiled around a long metal pin. When the switch is moved, the spring touches the center pole to make contact. So, when there's motion, the two pins will act like a closed switch. When everything is still, the switch is open. Great for basic projects and wearable's.

3.Temperature Sensor:LM35 converts temperature value into electrical signals. LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 requires no external calibration since it is internally calibrated. . The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4°C over a full −55 to +150°C temperature range. The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 µA from its supply, it has very low self-heating, less than 0.1°C in still air.

2.RELATED WORK [1][2]

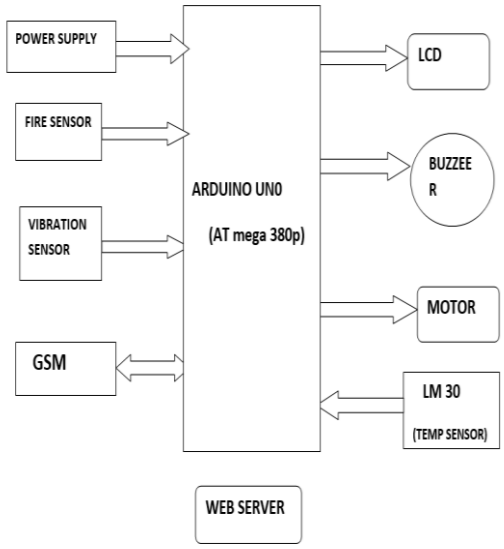
1. Buzzer: A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play."

2.LCD:LCD screen is an electronic display module and find a wide range of applications. A 16*2 lcd display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. A 16*2 LCD means

it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5*7 pixel matrix. This LCD has two registers, namely, command and data.The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing it screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of character to be displayed on the LCD. It is capable to display any character with ASCII values ranging from 0 to 255.

3. BLOCK DIAGRAM:

Although this study is currently at its early stages, it has already began to identify gaps in the current research concerning cybersecurity for the loT (namely structural inadequacies, lack of standards and cyber-security vulnerabilities), with an emphasis on the mining and resources industry. Evidence from a literature review has highlighted that security concerns are real and loT standards are lacking, together these pose a material threat to mining operations if not addressed or mitigated. This study will once complete, provide tangible guidance on the governance, design and implementation of secure loT solutions to the industry in mining solutions.



4. RESULTS

The simulation result provides an exact idea for temperature, fire, vibration, etc. .

The message about the changes of temperature, fire and vibration are sent to the website

"https://thingspeak.com/channels/272149/field/1.json"

If the temperature is high, then the message will be sent to the above website as

"High Temperature"

If the fire is occurred, then the message will be sent to the above website as

"Fire detect"

If the vibration is occurred, then the message will be sent to the above website as

"Vibration detect"

Here, proposed design is interface with Arduino platform and implemented the Arduino platform based monitor system with the help of Web server. Our system architecture gives micro web server application for communication between user and GPRS system. As the Arduino connected to IoT module. Also due to the continuous monitoring of environmental parameters like temperature and Fire, vibration, it is beneficial for mining production. So, proposed system is the very flexible and low cost monitoring system.

5. CONCLUSION

The primary factor in running any industry successfully is ensure the safety of person working that work area. Underground mining industry comes to the same category. Where each and every parameter such as methane gas, high temperature, fire accidents and so on has to monitor regularly. Every mining industry follows some basic precautions to avoid any type of unwanted phenomena. We are considering above mentioned situations and also monitoring mine workers activities e.g. Fall Detector that states workers position. A Major improvement is to implement internet of things in collecting and plotting parameter and sensor values to web sensors.

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