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ARCHAEOLOGIST'S LIVE MONITORING SYSTEM USING IOT

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ABSTRACT:
Nowadays many people are interested in excavation,so the safety of these archaeologists is essential . They risk their lives to know about the history and old technologies. Archaeologists being the backbone of new knowledge &information about old things,places usually lose their lives due to lack of medical help when in emergency, also archaeologists who are involved in missions or in special operations get straggled on unsecured places and lose contact with the authorities. To overcome this concerns we hadbuild a project using wireless body area sensor network (WBANS). Now recently wireless sensor networks (WSN) play a vital role in research, technological community hence resulting in the development of various high performances smart sensing systems.There are many concerns regarding the safety of these archaeologists. Archaeologists entering the abandon &risky places often lose their lives due to lack of connectivity, it is very vital for the safety team to known the location as well as health status of all those people. India has already lost so many archaeologists and common people as there was no proper health backup and connectivity between the archaeologists in the unsecured places and the officials at the safety team. credits. All must be really concerned about the safety of the archaeologist, so we have decided to build a project which will efficiently keep a check on the health status of the archaeologist, and his precise location to equip him with necessary medical treatments as soon as possible. Archaeologist's tracking is done using GPS and GSM is used to provide wireless communication system. For monitoring the health parameters of archaeologist we are using bio medical sensors such as temperature sensor and heart beat sensor. A CO sensor is used to monitor atmospheric conditions so if there are any climatic changes the archaeologist will be equipped accordingly.
Keywords: Archaeologist, communication, health, location and sensor.

1.INTRODUCTION:

Archaeology can be a fascinating, fun, and even adventurous hobby or career. But it also holds a more important place in society than many people visualize. In additional to the factthat isessential for historical research, it also has a great deal of community and economic value.

Archaeology has the potential to provide new information on the human past, solidify one's ties to their social or national heritage, and provide economic means to locations all across the world. One of archaeology's most important qualities is that it provides historical

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information on past societies from which we have no proofs. Archaeologists do face a lot of problems while they always been to the unknown and mostly unsecured places . Especially for the archaeologists who need to spend more than six hours in the field at a time faces so many challengeswhen working in the field. In addition to mud, bugs, and weather conditions, there are also the unpredictable problems that technical difficulties act as well as navigation.

When people think about their work, they imagine archaeologists digging for some sort of lost treasure or buried civilization. Pompeii is a known example of this. Pompeii was first excavated in 1748 after being preserved for over 2,000 years by lava from a volcano that exploded in 79A.D. Mostly everything was preserved including buildings and skeletons.Many archaeologists lost their lives due to weather changes. So our provides health condition of that person by continuous monitoring using sensors . pulse sensor, temperature sensor, CO sensor to provide indication about respective heart beat,temperature and oxygen levels.GPS and Web cam are also used position and live stream video.

Limitations of existing system:

- Lack of knowledge on atmospheric conditions inside caves.
- Insufficient information about location and health conditions of archaeologists.
- Lack of live monitoring about the resources.

The remaining paper deals as follows. Section2 describes the review of previous papers. Section3 and 4 describes hardware and software tools used in our system respectively. Section 5 describes the system architecture and working. Section 6 describes experimental results and section7 describes the conclusion and future scope.

2.RELATED WORK:

Health monitoring system using IOT[1] gives information about health conditions such as pulserate.Low cost security system camera[2] gives the live monitoring using raspberry pi used as CCTV.IOT health care system[3] used same technology as in [1].GPS track system[4] gives the information about latitude and longitude which helps in finding the live location of anyone. Surveillance and monitoring system[5] helps in tracking the location and also gives live status using camera module and raspberry pi.Learn about raspberry pi and about pin configurations[6].Download and learn about VNC viewer [7].

3.HARDWARE COMPONENTS:

- Raspberry Pi3
- Temperature Sensor (LM35)
- Pulse Sensor
- CO Sensor
- GPS Module
- Camera Module
- A/D Converter
- LCD Display

4.SOFTWARE TOOLS:

- Python that can be used to read data from Raspberry Pi

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- Retrieve the data through an app (by using Pushetta) and LCD display
- VNC viewer

5.SYSTEM ARCHITECTURE AND WORKING:

5.1 BLOCK DIAGRAM:

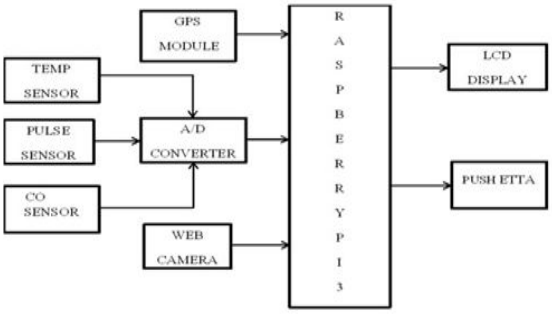

Fig 2.1 Block diagram of system

Raspberry Pi is used to read data from the sensors and the Raspberry is powered with a adapter. The Raspberry Pi is controlled via VNC ViewerWearable Sensors like pulse sensor, temperature sensor, CO sensor are used to monitor various health parameters and environmental condition. GPS and camera module are used to obtain the location and continuous monitoring. These sensors are interfaced to the Raspberry Pi board. Raspberry Pi acts as a platform to collect data obtained from various sensors and represent them.Python helps in our system to read data from Raspberry Pi and present it through LCD display. The data is also sent to pushetta to convey the information about the health status and current location. Pushetta authentication is a token based; a User registered on pushetta get a token he/she have touse with API calls. You can get your token from API itself of getting it in dashboard.

5.2 WORKING:

CIRCUIT DIAGRAM:

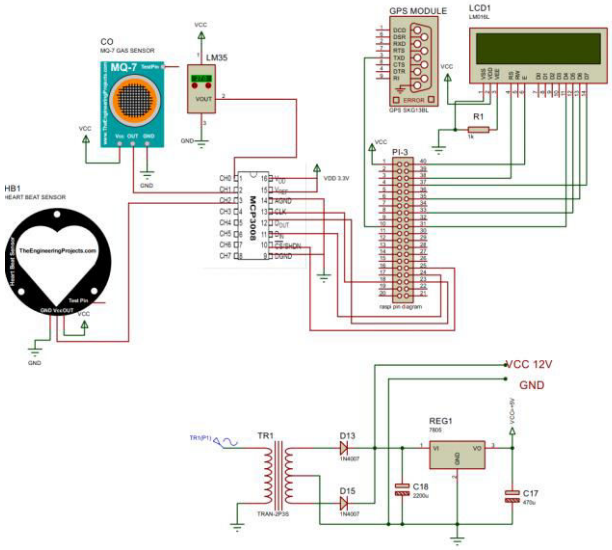

Fig 5.2 Circiut diagram

PROCEDURE:

- Connect the sensors (pulse sensor, temperature, CO) to the Raspberry pi through A/D converter (Mcp3008),GPS, LCD display to the Raspberry pi using GPIO pins.
- Apply 5V DC supply to the components through the DC regulated power supply and power the Raspberry pi through the adapter.
- Pulse, temperature, CO sensors and GPS module are the inputs to the Raspberry pi, while LCD is the output module.
- When switch on all the power supplies, all the sensors, microcontroller and LCD display should be turned ON.
- Initially LCD displays the welcome message as “Welcome to Raspberry pi”. Then go to VNC viewer enter a VNC server address (sever address is the IP address)
- Note that Raspberry pi and computer should be connected to same IP address.

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- Enter the IP address in this format (your IP address: 1).
- After entering the IP address it ask password to enter into LINUX operating system and the password is Raspberry Pi model number.
- Then Open the command screen and execute the code.
- For execution type (sudo nano 'file name'.py). In this project file name is 'main'.
- Then display shows all the outputs of the sensors through Raspberry pi.
- Pulse sensor: Initially which gives the ZERO heart beat value, whenever a person touches the sensor it reads the heartbeat of the person and Raspberry pi reads the output of the sensor, which sense the output to display and notification message will get through pushetta app.
- Temperature sensor: Initially it gives the room temperature, and which gives the body temperature of the person whenever it touches and Raspberry pi reads the output of the sensor, which sense the output to display and notification message will get through pushetta app.
- CO sensor: which gives the how much of the CO gas present in environment and Raspberry pi reads the output of the sensor, which sense the output to display and notification message will get through pushetta app.
- GPS module: It gives the location of the person in terms of longitudes and latitudes. The raspberry pi reads the output from the module and senses it to the display and notification message will get through pushetta app.
- The camera module is directly connected to raspberry pi and person is continuously monitored. The continuous monitoring can be viewed by entering the IP address: 8081 on the web browser and the person is viewed directly on the screen.
- Here we are using a simple broad cast communication of pushetta to send the all above sensors outputs as a notification message.
- We can also set the time interval to receive information from pushetta by adjusting the sleep time in python source code. If we set the sleep time as 30 seconds and run the code, then pushetta sends the information of the sensors output and location for every 30 seconds. By changing the sleep time the speed of receiving the notifications can be reduced.
- By following all the above steps carefully we can monitor and track the status of an archaeologist.

6.RESULTS:

Various health parameters of an archaeologist are measured using wearable sensors connected to body. The position of the archaeologist is tracked by using GPS module and continuous monitoring can be done with the help of camera module. Data collected through Raspberry-pi is provided to pushetta.After connecting sensors to body run the python code. Python code reads data from serial port and the data of the archaeologist is sent through pushetta. Pushetta authentication is a token based; a user registered on Pushetta get a token he/she have to use with API calls. You can get your token from API itself of reading dashboard.

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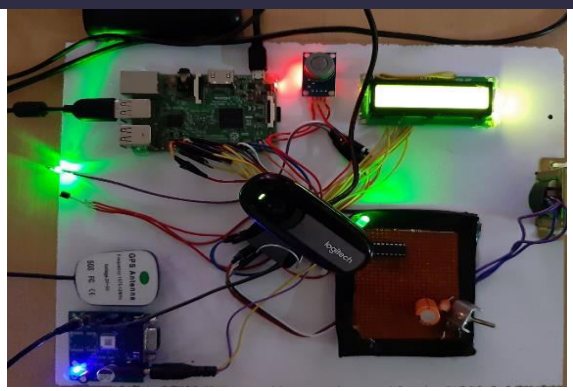

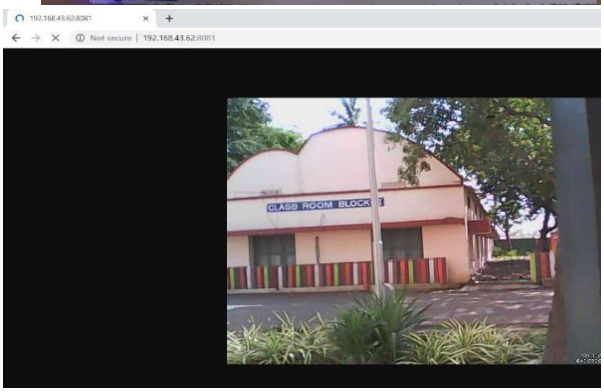

7.CONCLUSION AND FUTURE SCOPE:

7.1 CONCLUSION:

A prototype of archaeologist health indication system has been achieved, offering a system that is able to collect data from health sensors, GPS module and able to send to any base station. It does not require any technical intervention because it offers the auto setup that can be easily used by everyone. Extensions to present system can be easily done. By adding essential hardware any parameter can be easily measured.

Our system has following features:

- Portable and easy to use.
- Low cost, multiple numbers of persons can access data by having app in their mobiles.
- Fully automated system avoids requirements of human attention

7.2 Future scope:

- Multiple parameters like blood pressure, Glucose levels can be included as controlling parameters in future.
- More than single person at different places can be monitored using single system.
- Threshold levels can be included so that pre alert messages can be sent to patient.
- We can also add oxygen sensor as a measuring parameter and bring correlation between oxygen and atmospheric pressure.

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[6]Detailed description of raspberry pi is in following sitewww.raspberrypi.org

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