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SMART HELMET FOR CONSTRUCTION WORKS

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Abstract

According to government regulations , helmet Wearing is required on construction sites in India . The impact of a falling object form any height can Be avoided by wearing a helmet. The work mode(ON\OFF) GPS system , smoke sensor and Task completion button Were included to transform the standard helmet into a smart helmet in this if someone wears a helmet the helmet will automatically update the work mode ON and send the sends information to the supervisor. This helmet is intend to provide the Constant Observation of the labours and to prevent them from any health threats while working. The suggested solution outlines a smart , reasonably priced helmet for construction workers.

Keywords: Construction-GPS system-Smoke sensor-Transform-Observation-labours-threats-constant.

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INTRODUCTION

The safety of employees on construction sites can be improved with the help of an innovative and highly effective solution: a smart helmet. It is a high-tech helmet that combines a number of cutting-edge technologies to give employees and supervisors real-time data and alarms, enhancing their general safety and protectivity . The smart helmet, in contrast to conventional helmets, is furnished with sensors, and other tools that let it track and detect a variety of physical and environmental factors, such as temperature, humidity, noise, and the presence of dangerous chemicals.

In order to spot any signs of exhaustion or stress, it may also monitor the wearer's physiological data, such as heart rate and body temperature.

Additionally, the helmet has the ability to alert managers and employees to potential dangers like falling objects or hazardous weather conditions. Additionally, it can give workers immediate feedback on their posture, motions, and general performance, assisting in the reduction of accidents and injuries . Ultimately, the smart helmet is a ground-breaking and essential instrument that has the potential to significantly improve the productivity, efficiency, and safety of employees in the construction sector.

The use of cutting-edge technologies makes it an invaluable tool in the contemporary workplace, guaranteeing that employees can carry out their duties in a secure setting. One sort of safety gear that incorporates cutting-edge technology to enhance worker safety on construction sites is the smart helmet for construction work. It is intended to provide in-the-moment monitoring and analysis of numerous physiological and environmental parameters, which can aid in accident prevention and enhance all-around worker safety . The smart helmet is fitted with a number of sensors that may identify a variety of dangers, including high noise levels, gas leaks, and excessive heat. Additionally, it can track a worker's vital statistics like heart rate and body temperature and provide notifications if there are any signs of stress or fatigue.

The smart helmet has emerged as a possible solution to the construction industry's growing demand for efficiency and safety. It provides evidence of how technology can improve worker productivity and safety in risky working conditions. The smart helmet is likely to become a crucial piece of construction businesses' safety equipment as they prioritise employee safety.

II METHODOLOGY

During this experiment, a regular helmet is used to taken into account, and updated it with the most recent developments to satisfy the various criteria at the controlling the time, ensuring workers safety, monitoring workers activity, and other aspects of a construction site. There is a lot of work to be done about the concurrent activities, such as the detection of various gases etc.

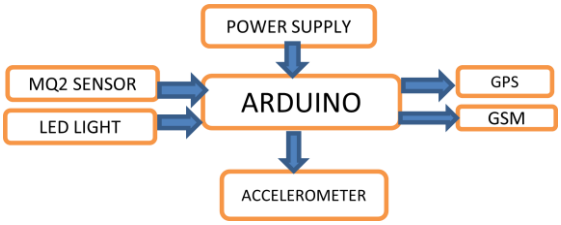


FIG 1:BLOCK DIAGRAM

Educational institutes, public transport, regular shops, etc. Ultrasonic sensors detect the presence of a hand and activate a pump to pour the sanitizer on anyone who comes into contact. This detects detect the human and senses the temperature whenever a person comes in contact. To disperse the sanitizer, a 12V DC pump is activated by an ultrasonic sensor. Movement is detected by the motion sensor in which triggers the high-

pressured mini submersible pump. The nozzles dispense the body sanitizer. The Arduino user interface was programmed using C++.

There are a few system requirements that must be completed in order to install the Arduino IDE for the Smart Helmet for Construction. These conditions are

Operating system: Windows, Mac OS X, and Linux all support the installation of the Arduino IDE.

Processor: A 1.6 GHz or better processor is required in the computer .

RAM: At least 1 GB of RAM is required on the machine .

Hard Disc Space: The computer has to have 500 MB or more of free disc space .

USB Port: A USB 2.0 or 3.0 port must be present on the PC .

Following these steps will allow you to install the Arduino IDE when these system prerequisites have been satisfied:

MATERIALS AND METHODS

1.AURDINO UNO-The many sensors and gadgets connected to the Arduino Uno's input ports provide input signals that the Arduino Uno uses to operate. These signals are subsequently processed by the microcontroller, which employs pre-programmed code to decipher the signals and provide suitable output signals to manage other devices linked to its output pins.

FIG 2:ARDUINO

2.ACCELEROMETER-A sensor called an accelerometer monitors an object's acceleration along one or more axes. It can be used to find shifts in vibration, orientation, and speed. Consumer electronics, medical technology, aerospace, and automotive industries all often use accelerometers.

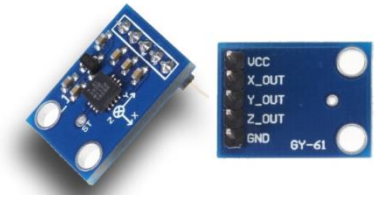


FIG 3:ACCELEROMETER

3.GPS-A satellite-based navigation system called the Global Positioning System (GPS) enables users to pinpoint their precise location and follow their movements at any time and from any place in the world. A system of at least 24 Earth-orbiting satellites, ground-based control stations, and user receivers make up the GPS system.

FIG 4:GPS

4 MQ2 GAS SENSOR-A typical gas sensor that can identify a variety of gases, including smoke, propane, methane, and alcohol, is the MQ2. The sensor operates on the chemiresistance principle, which states that when it comes into touch with various gases, the resistance of the sensor varies.

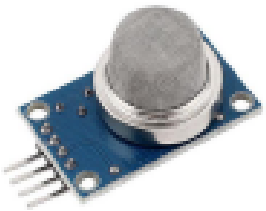


FIG 5:MQ2 SENSOR

5 GSM-Mobile phones and other portable devices employ the GSM, or Global System for Mobile communications, standard for digital cellular networks. With a network of base stations, GSM technology enables mobile phones to interact with one another and with other devices.

FIG 6:GSM

6 LED-An LED, or Light Emitting Diode, is a semiconductor device that emits light when an electrical current is passed through it. LEDs are commonly used in a wide range of electronic devices such as indicator lights, displays, and backlighting

FIG 7:LED

7 LDR-A type of electronic component called an LDR, often referred to as a photoresistor, alters its resistance in response to the amount of light that strikes its surface. The photoconductivity of specific semiconductor materials, such as cadmium sulphide or cadmium selenide, serves as the foundation for the operation of an LDR.

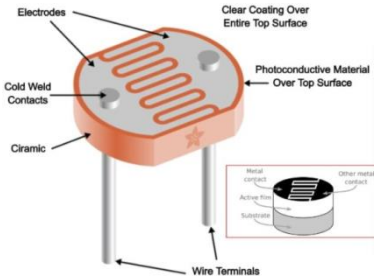


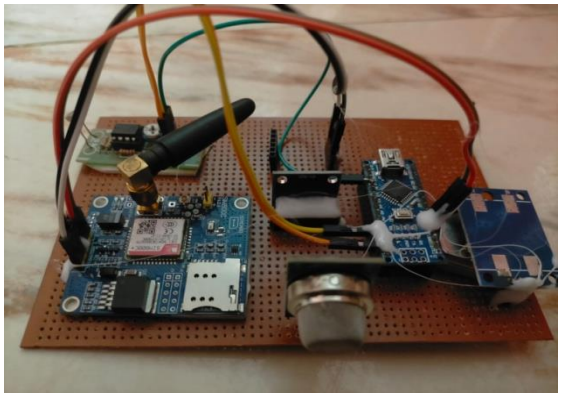
FIG 8:LDR

8 CONSTRUCTION HELMET-The are made to completely protect employe Safety elemets, from serious head injuries, electric shocks, and puncture wounds that might result from the falling of large objects.

FIG 9:CONSTRUCTION HELMET

RESULT AND DISSISION

In terms of strengthening worker safety and boosting general productivity on construction sites, the smart helmet has demonstrated encouraging results.



OUTERSIDE INNERSIDE

FUTURE SCOPE:

Improved safety features: Sensors can be added to smart helmets to identify possible risks and warn employees before accidents happen. For instance, they are able to identify poisonous gases, falls, and impacts and inform both employees and managers.Better communication: Real-time communication between employees and managers can be achieved via smart helmets. This can guarantee that staff members receive instructions, are aware of changes to the workplace, and have the opportunity to ask questions as needed

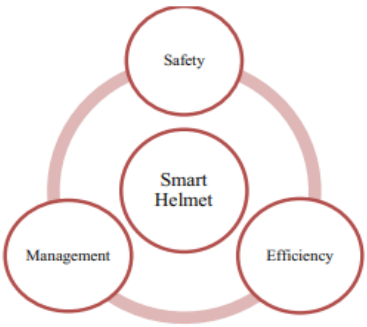


FIG g) CONCEPT SKETCH FOR IOT FUTURE

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