

Accident preventing smart helmets using Atmel controller.

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ABSTRACT

The smart helmet which makes motorcycle driving safer than before. The aim of this concept is to give information about the accident to ambulance N family members. This is implemented using Microcontroller. This smart helmet was implemented by placing various sensors in different places of the helmet where the hitting is more which are connecting to arguing board. Two push buttons are provided to ensure whether the user wear helmet or not. In this method we have use accelerometer measures the static acceleration of gravity. Free-fall sensing notices if the bike is falling. Moreover, Bike unit decides that accidents occur or not. The Alcohol sensor used to detect the alcohol content from the breath of the rider. When the date exceeds minimum stress limit, then the GSM module sends a message to family members automatically

Keywords- Smart helmet, Accelerometer sensor, MQ6 sensor, GSM, Microcontroller, ambulance.

INTRODUCTION

There is an alarming increase the morbidity and mortal it due to two-wheeler road traffic accidents. There has been the matter of vast knowledge about globally. In India, it is evaluated that single accident happened place every 2 minutes. This data collected from the National Crime Records Bureau its indicate that deaths and injuries related to the road traffic accident have increased two and four fold respective during the duration 1991–2005. Reportedly 98,254 persons were killed in 2005 on Indian roads [1]. The occupants and riders of two-wheeler vehicles are among the majority to be affected in road traffic mishap. Two-wheeler mishap has also been shown maximum case fatality in the mishap.

Despite the safety rules made by the government, many riders fail to abide by them. The riders in India often bypass the primer rule of wearing the helmet while riding. This leads to fatal problems

for the rider in case of the mishap. Apart from manual checking, there need to be functions that can enforce this order upon the two-wheeler riders and hence protect them from bypassing it. One of the prime reasons that lead to accidents is "drunk and drive". Due to drinking and driving, two-wheeler riders often get into mishaps. Almost 70% of the mishaps in our country can be protected if the riders stop consuming alcohol before riding. The people involved in the mishaps need to be taken care of and immediately taken to the emergency room. However, there is a lag in handling the aftermath of road accidents in the country. The nearby police station needs to be notified immediately about the accidents so that they can be taken to the hospitals immediately.

Literature survey

Safety Helmet for Motorcyclist is a venture attempted to build the rate of road security among motorcyclists. There are numerous nations authorising directions to wear a head protector while riding. India is

an illustration. The thought is gotten after realising that the expanding number of deadly road mishaps throughout the years is cause for worry among motorcyclists. This undertaking is intended to present programmed self-governing fog light innovation for the well being of the motorcyclist. Here, we centre around wise headlamps that respond as per the rider's facial development. It makes utilisation of accelerometer and different sensors to coordinate little electric motors incorporated with the front lamp packaging to turn the headlights as needs are.[1]

This concept is the execution of safety helmet for coal excavators. This helmet is outfitted with methane and carbon monoxide gas sensor. This sensor senses the gas and the information is transmitted to the control room remotely, through a remote module called X-Bee associated with the helmet. 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 keeps the plant and the labourers safe by keeping an up and coming mishap.[2]

It is realised that head gesture and brain action can mirror some human practices identified with a danger of accident when utilising machine-devices. The exploration exhibited in this paper goes for lessening the danger of damage and consequently increment labourer safety. Rather than utilising the camera, Smart Safety Protective cap (SSH) with a specific end goal to track the head gesture and the brain movement of the labourer to perceive exemplary conduct. Data removed from SSH is utilised for processing danger of an accident (a safety level) for averting and diminishing wounds or accidents. The SSH framework is a modest, non-meddlesome, non-invasive, what's more, non-vision-based framework, which comprises of an Inertial Measurement Unit (IMU) and dry EEG cathodes. A haptic gadget, for example,

vibrotactile engine, is incorporated to the head protector with a specific end goal to alarm the administrator when processed hazard level (weariness, high pressure or blunder) achieves an edge. Once the hazard level of accident breaks the limit, a flag will be sent remotely to stop the applicable machine process.[3]

Safety head protector wearing identification is exceptionally basic in control substation. This paper proposed a creative and down to earth wellbeing head protector wearing identification strategy given picture handling also, machine learning. At to start with, the ViBe foundation demonstrating calculation is misused to recognise movement protest under a view of fix surveillant camera in control substation. In the wake of getting the movement area of intrigue, the Histogram of Oriented Gradient (Hoard) feature is separated to depict inward human. Moreover, after that, given the consequence of HOG feature extraction, the Support Vector Machine (SVM) is prepared to characterise walkers. At long last, the security protective cap location will be executed by colour feature recognition. The convincing test comes about exhibited the accuracy and adequacy of our proposed strategy.[4]

Unsafe conditions in the working environment are a critical supporter of wounds because of mischances and also chronic infections. There are numerous occupational health and safety (OHS) frameworks, yet they are exorbitant or not adaptable. This method presents a minimal effort OHS. It comprises of different sensors that can be used to screen whether a safety helmet is being worn, the labourer is versatile, and safety boots are being worn. The framework interfaces with a wireless sensor network and is appropriate for activity in conditions, for example, underground mines and sawmills.[5]

Smart Helmet for the wellbeing of bicycle riders which incorporates a liquor

sensor to guarantee the person who is driving the bicycle is calm, and a rider verification was utilising face acknowledgement to control burglary. The modified microcontroller 8051 demonstrates whether the rider is wearing the cap with the assistance of two IR sensors, the liquor sensor MQ-3 which is utilised to check the liquor utilisation level and the ARM 7 board, which is incorporated with the PC utilising COM port1. A face detection calculation called Viola-Jones combined with SVM (support vector machines) for arrangement is used to find faces for extra wellbeing and security for the bicycle rider. If every one of the parameters is all right, at that point the biker is all set to utilise the vehicle. (6)

Thinking about the vast and expanding number of development extends that are being directed in the U.S., there is a developing need of creating imaginative techniques to screen the wellbeing of the specialists at development destinations naturally. Since the head is the most basic region of a human body also, is the most helpless against an effect that could cause actual damage or passing, the utilisation of a defensive head protector in development work is required, we mean to naturally identify the employment of development head protectors by investigating the development observation pictures. Given the gathered pictures, we initially recognise the protest of intrigue and further dissect whether the specialist wears the head protector or not, by utilising PC vision and machine learning strategies. In the first step, we consolidate recurrence area data of the picture with a prevalent human detection calculation Histogram of Oriented Inclination (HOG) for development specialist detection; in the second step, the blend of shading based and Circle Hough Transform (CHT) include extraction procedures is connected to recognize protective cap utilizes for the development of laborer.[7]

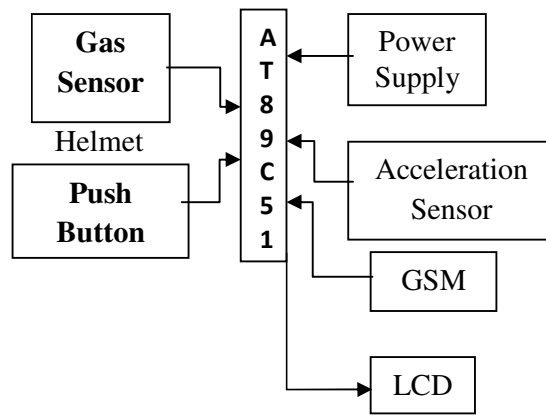
The underground mines everywhere the world are influenced by various risks including vaporous explosions, landslides, fire dangers. A superior communication innovation must be utilised for an intelligent sensing and warning framework. For this, RF innovation is picked for the communication inside the mines. These wireless sensor network constructing of different sensors detects mine environment parameters like temperature, weight, humidity, gases like methane, and carbon monoxide, and so on. The predetermined parameters are handled and are utilised for a new intelligence warning framework with the assistance of modified alert sounds if there is any serious deviation from the typical parameter esteem go. The RF innovation is additionally utilised as locating framework, which helps in locating the mine-specialists. This RF-based wireless sensor network is reliable with simple installation and quick sensing and locating framework. The helmet module goes about as an intelligent, low power node in the wireless sensor network. The sensors are utilised to quantify the variations in the temperature, humidity, weight, fire and take decisions for required actions given the deliberate information to guarantee the security of the underground mine specialists. The RF innovation likewise guarantees the localisation of the mine specialists for their security in a dangerous working stage. [8]

Accidents are expanding step by step, so endeavours are made to keep away from them to limit their outcomes. We live in an existence where the principles of the road have no significance for individuals, and they are consistently disregarded. Likewise, its human nature to oppose what is forced on them. In this manner, utilising an alternate point of view, we give wellbeing rich and astute highlights utilising a shrewd protective cap. Two modules one on the cap and bicycle each will work in synchronisation, to guarantee

that the biker is wearing the head protector. A radio recurrence module is in charge of the foreign correspondence between the head protector and the bicycle circuit. The ALCO-LOCK work is utilized to anticipate drink and drive situations Accelerometer identifies, and this is reached out by utilizing GSM module in our circuit, which is intended to consequently send one message to one individual contact and one concerned expert that the individual has been into a mischance and a haze sensor for expanding permeability if there should arise an occurrence of haze or brown haze are additionally utilized.[9]

Even though cruiser safety protective caps are known for averting head wounds, in numerous nations, the utilisation of cruiser head protectors is low because of the absence of police capacity in implementing protective cap laws. This paper displays a framework which consequently recognises cruiser riders and discovers that they are wearing protective safety caps or not. The framework removes moving objects and characterises them as a cruiser or other moving objects given highlights removed from their area properties utilising K-Nearest Neighbor (KNN) classifier. The leaders of the riders on the perceived bike are then checked and sectioned in light of projection profiling. The framework characterises the head as wearing a cap or not utilising KNN in light of highlights got from 4 segments of portioned head locale. The analysis comes about to demonstrate a normal right detection rate for the closed path, far path, and the two paths as 84%, 68%, and 74%, separately.[10]

Methodology



Vehicle

AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 families. ATMEL89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be deleted and programmed to a maximum of 1000 times.

In 40 pin AT89C51, there are four ports designated as P₁, P₂, P₃ and P₀. All these ports are 8-bit bi-directional ports, i.e., they can be used as both input and output ports. Except for P₀ which needs external pull-ups, rest of the ports have internal pull-ups. When 1s are written to these port pins, they are pulled high by the internal pull-ups and can be used as inputs. These ports are also bit addressable, and so their bits can also be accessed individually.

Port P₀ and P₂ are also used to provide low byte and high byte addresses, respectively, when connected to external memory. Port 3 has multiplexed pins for the exceptional purpose like serial communication, and hardware interrupts, timer inputs, read/write functions from external memory. AT89C51 has an integral UART for serial communication. It can be programmed to operate at various

baud rates. Including two timers & hardware interrupts, it has a total of six interrupts.

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4 Kbytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is constructed by using Atmel's high-density nonvolatile memory technology and is compatible with the industry standard MCS-51 instruction set and pinout.

The reason for this is to interface the sensors and module into the appropriate section. This is very important where the components placed then only it will sense (or) works as expectedly.

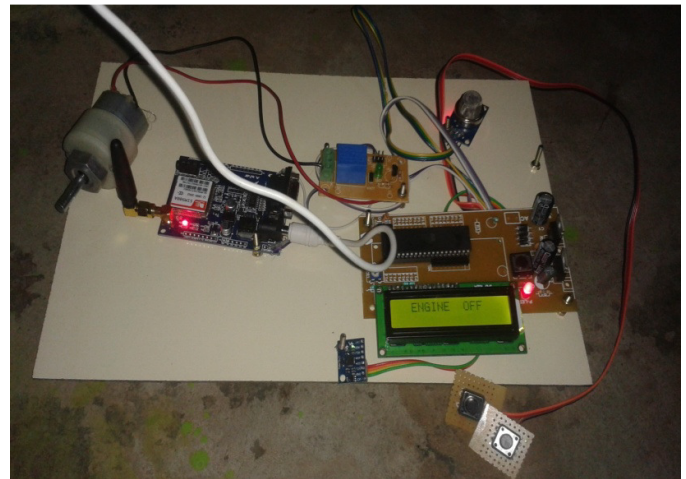
AT89c51 is a bit pic microcontroller, and gas sensor, push button is connected to the pic microcontroller, these both are the helmet functions. Bike functions are a power supply, acceleration sensor, GSM, LCD

GSM/GPRS Modem-RS232 is built with Dual-Band GSM/GPRS engine-SIM900A works on frequencies 900/ 1800 MHz. The Modem is with RS232 interact, which allows you to connect PC as well as along with the microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem has internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface. The onboard Regulated Power supply authorises to connect extensive range unregulated power supply. Utilize this modem; we can produce audio calls, SMS, Read SMS, attend the incoming calls and internet through simple AT commands

Results and discussion

We have discussed the savvy head protector which we created. It has two segments, i.e., a protective cap segment

and a bicycle segment. The head protector area incorporates liquor identification and can distinguish whether the rider is wearing the protective cap. The second segment of the undertaking manages the face acknowledgement of the approved proprietor. Incorporating highlights of all the equipment parts used to have produced. Nearby of each module has been regard out and put painstakingly hence adding to the best working of the unit. Furthermore, using exceedingly propelled IC's and with the assistance of developing innovation both the model and continuous working model has been expertly executed.



It represents the final output of the project. It consists of Alcohol & accelerometer sensors, GSM, Microcontroller, LCD and DC Motor. The accelerometer is fixed in the helmet this will detect alcohol consumed by a driver, the accelerometer is fixed in bike portion, if bike fell while running, it will send a message by GSM. In this project, we used a DC Motor to consider a bike. The experimental test was finished. In real life experimentation no need pressing. For future GSM module, and GPS module we have used in emergency situation.

CONCLUSION

Smart Helmet ensures the safety of the rider, by making it necessary to wear the helmet, and ensures that the rider has not consumed any alcohol. If any of these prime safety rules are violated, the system will prevent the biker from starting the bike. The system also helps in efficient handling of the aftermath of accidents by sending an SMS location of the biker to the police station. This product that the victims get proper and prompt medical attention if met with an accident. From this project, the fundamental principle of the Alcohol & Accelerometer sensors and GSM can understand. The programs from the C language can be learned, and the soldering process is understood. The connection we understand about the fundamental principle of the Alcohol & Accelerometer sensors and GSM can understand. The programs from the C language can be learned, and the soldering process is understood. The connections like where should Vcc connected and where is ground should be connected, lopping procedure, Microcontroller ports, the pins of the LCD and how can the contrast of the LCD is adjusted, and how the Relays can be used for the switching process and act as a driver between the Motor and the microcontroller are learned.

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