ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

ACCIDENT ALERTING SYSTEM TO SAVE BIKERS USING SMART HELMETS

R S Saravanakkumar[1] Mr.Muniraj[2]

Dr.M.Willjuice Iruthayarajan[3]

UG Scholar[1], Asst.prof.[2],PROF/HOD[3]

National Engineering College

INTRODUCTION

India witnessed one road accident every 3.7 minutes in 2011 which claimed one every 3.7 minutes, one of the highest in the world. In another disturbing trend, in the total number of road accidents, 53.5% were reported from rural areas, reflecting a rising tide of motorisation in rural India. To make a resolution to this issue, Madras High Court passed an order that all the two wheeler riders in Tamil Nadu must wear helmets form July 1, 2015. It shows that a number of precious lives are lost due to non-wearing of protective head gear. Smart helmets are the next advancement in the safety systems to eradicate the life loss in accidents.

Helmets are used to protect the head from accidental injuries and are widely used by motor cyclists, auto racers, bike riders etc. This invention is about safe guarding the biker's life in case of accidents by sending an immediate alert message to a person who is most concerned with the biker along with the current location of the biker. A high energy impact or several low energy impacts may render the helmet incapable of adequately protecting the user. Making use of the Shock and vibration data logger, the high energy impact made to helmet during accidents is detected. Once the shock waveform is detected, the warning about the occurrence of accident is sent to the concerned persons and emergency system along with the details of the location of the injured person. Within a short period of time the person could be taken for treatment. Thus this alerting system provides improved solutions to reduce the death rate caused due to road accidents

Even though helmet is a protective gear, it may not withstand adverse conditions. Hence proper alerting system will safeguard the victim's life.

OBJECTIVES:

- To reduce the death rate in road accidents
- To increase the probability of the injured biker to get medical assistance within a short period after the occurrence of accidents.
- To reduce the death rate due to road accidents.
- Enhance the conventional helmets with use of technology.

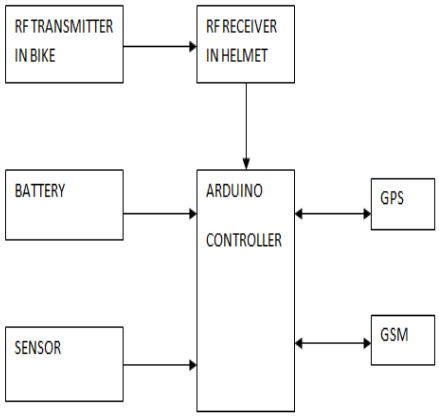
ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

- By analysing the high energy impact or repeated low energy with respect to the longitude of fall, the withstanding capability of helmets can be surveyed and improvements could be made in design.

METHODOLOGY:

The helmet will be switched on when the bike starts. The helmet and the bike are connected through Bluetooth. The current location of the biker is monitored continuously by the GPS fitted in the helmet. If an accident happen to the biker then it will be sensed by the sensor and this signal will be sent to the micro controller. From the micro controller a command signal will be sent to the GSM and the GSM will send an alert message along with the current location of the biker to a mobile number which is stored in the controller. GPS positioning is done in the form of latitude and longitude along with exact position of the place by Google maps.

BLOCK DIAGRAM



DESCRIPTION OF COMPONENTS USED:

GLOBAL SYSTEM FOR MOBILES (GSM):

Global system for mobiles technology is used to establish cellular connection. It is a digital cellular communication system. GSM is used for transmitting mobile voice and data service.. GSM is a cellular network, which means that cell phones connect to it by searching for cells in the immediate vicinity. There are five different cell sizes in a GSM network—macro, micro, pico, femto, and umbrella cells. The coverage area of each cell varies according to the implementation environment. GSM networks operate in a number of different carrier frequency ranges (separated into GSM frequency ranges for 2G and UMTS frequency bands for 3G), with most 2G GSM networks operating in the 900 MHz or 1800 MHz bands. Where these bands were already allocated, the 850 MHz and 1900 MHz bands were used

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

instead (for example in Canada and the United States). In rare cases the 400 and 450 MHz frequency bands are assigned in some countries because they were previously used for first-generation systems. GSM uses several cryptographic algorithms for security. The A5/1, A5/2, and A5/3 stream ciphers are used for ensuring over-the-air voice privacy. A5/1 was developed first and is a stronger algorithm used within Europe and the United States; A5/2 is weaker and used in other countries.

GLOBAL POSITIONING SYSTEM (GPS):

The vital role of GPS is to trace the position of the required object. GPS receiver gets the location information from satellites. One of the key features of GSM is the Subscriber Identity Module, commonly known as a **SIM card**. The SIM is a detachable smart card containing the user's subscription information and phone book. This allows the user to retain his or her information after switching handsets. Alternatively, the user can also change operators while retaining the handset simply by changing the SIM. Some operators will block this by allowing the phone to use only a single SIM, or only a SIM issued by them; this practice is known as SIM locking.

SHOCK AND VIBRATION SENSOR:

The Vibration Sensor Detector is designed for the security practice When Vibration Sensor Alarm recognizes movement or vibration, it sends a signal to either control panel Developed a new type of omni-directional high sensitivity Security Vibration Detector with omni-directional detection

- Sensitivity: Height adjustable
- Consistency and Interchangeability: Good
- Reliability and Interference: Accurate triggering strong anti-interference
- Automatic Reset: Automatic reset is strong
- Signal Post-processing: Simple
- Output Signal: Switch signal
- No External Vibration Analysis of Plates: Product design vibration analysis of the internal amplifier circuit
- Detection Direction: Omni-directional
- Signal Output: Switch signals
- Output Pulse Width: The vibration signal amplitude is proportional to
- Operating Voltage: 12VDC (red V + shield V-)
- Sensitivity: Greater than or equal 0.2g
- Frequency Range: 0.5HZ ~ 20HZ

RF TRANSMITTER AND RECEIVER:

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio frequency (RF) communication. For many applications the medium of choice is RF since it does not

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

require line of sight. RF communications incorporate a transmitter and/or receiver.

TRANSMITTER MODULES

An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data. Transmitter modules are usually implemented alongside a micro controller which will provide data to the module which can be transmitted. RF transmitters are usually subject to regulatory requirements which dictate the maximum allowable transmitter power output, harmonics, and band edge requirements

.

RECEIVER MODULES

An RF receiver module receives the modulated RF signal, and demodulates it. There are two types of RF receiver modules: super heterodyne and super-regenerative receivers. Super-regenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage. Super heterodyne receivers have a performance advantage over super-regenerative; they offer increased accuracy and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in turn leads to a comparatively more expensive product.

ARDUINO MINI

OVERVIEW

The Arduino Mini is a small microcontroller board originally based on the ATmega168, but now supplied with the 328.(datasheet), intended for use on breadboards and when space is at a premium. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 8 analog inputs, and a 16 MHz crystal oscillator. It can be programmed with the USB Serial adapter or other USB or RS232 to TTL serial adapter.

The new Mini (revision 05) has a new package for the ATmega328, which enables all components to be on the top of the board. It also has an onboard reset button. The new version has the same pin configuration as revision 04.

Warning: Don't power the Arduino mini with more than 9 volts, or plug the power in backwards: you'll probably kill it.

SUMMARY

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage	7-9 V
Digital I/O Pins	14 (of which 6 provide PWM output)

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

Analog Input Pins	8 (of which 4 are broken out onto pins)
DC Current per I/O Pin	40 mA
Flash Memory	32 KB (of which 2 KB used by bootloader)
SRAM	2 KB
EEPROM	1 KB
Clock Speed	16 MHz
Length	30 mm
Width	18 mm

PROGRAMMING

The Arduino Mini can be programmed with the Arduino software (download

To program the Arduino Mini, you will need a USB Serial adapter or other USB or RS232 to TTL serial adapter.

The ATmega328 on the Arduino Mini comes preburned with a bootloader that allows you to upload new code to it without the use of an in-system-programmer. The bootloader communicates using the original STK500 protocol (reference, C header files).

You can also bypass the bootloader and program the ATmega328 with ICSP (In-Circuit Serial Programming); see the page on bootloading the Mini for information on wiring up an ICSP header to the Mini and the programmer for instructions on using a programmer to upload a sketch.

INPUT AND OUTPUT

Each of the 14 digital pins on the Mini can be used as an input or output. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kOhms. Pins 3, 5, 6, 9, 10, and 11 can provide PWM output. If anything besides the Mini USB (or other) adapter is connected to pins 0 and 1, it will interfere with the USB communication, preventing new code from being uploaded or other communication with the computer.

The Mini has 8 analog inputs, each of which provide 10 bits of resolution (i.e. 1024 different values). Inputs 0 to 3 are broken out onto pins; input 4 to 7 require soldering into the provided holes. By default the analog inputs measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and some low-level code.

See also the mapping between Arduino pins and ATmega168/328 ports.

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 3, April 2016

AUTHORS:

First Author	R S Saravanakkumar BE (Electrical and Electronics Engineering) Email:saravanasoundar@gmail.com
Second Author	Mr.Muniraj.ME (Assistant Professor) Email: munirajeee@nec.edu.in
Third Author	Dr.M.WilljuiceIruthayarajan.ME.Ph.D (Professor and Head).Email: hodeee@nec.edu.in
Institute	National Engineering College

REFERENCE

International Journal of Electrical and Electronics Research ISSN 2348-6988 (online) Vol. 2, Issue 4, pp: (122-127), Month: October - December 2014