Ingenious Armor For A well Being Society

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Abstract: The main aim of this paper is to design a wireless communication between helmet and the bike, so that the bike rider would mandatorily use his helmet, indeed to have a safe drive.In this paper, helmet plays a vital roleand so we named this device as INGENIOUS ARMOR, which is cleverly and originally devised to be well-suited for its purpose i.e.,for protection from death and head injuries.This paper is designed around a Microcontroller which forms the control unit of the project. According to this paper, the bike doesn't ignite until and unless the bike rider wears the helmet. This is done by communication between helmet (transmitter) and the bike (receiver).In the same way, i.e., if the bike rider is in drunken state then also bike doesn't get ignite. And if the person unfortunately meets with an accident then a message would be sent to his beloved family

members, police, and ambulance in order to save a life to a possible extent. And the bike rider is indicated with a buzzer at wide curving's or any accident prone areas and of school zones. The above two cases are carried with use GPS &GSM modules.

Index Terms: Accelerometer, Tilt sensor, Alcohol sensor(MQ3), RF module,

I.   INTRODUCTION:

An accident is a sudden action of carelessness or rashness in driving. So accident is unexpected and not done wishing to hit someone. Many people are losing lives in accidents. In a survey its been recorded that for every three there is an Indian losing life. This is really a depressing thing.Accidents involve many types of vehicles and surprisingly two wheelers constitute a major share of the accidents. In the present day scenario the world has become so competitive and rapidly developing. In this technologically developing world, a two wheeler can be afforded by an ordinary person and this is the reason two wheelers constitute a major role in the death toll of accidents. Most of the people who met with accidents are losing their lives in major threat of head injuries. The main reason for the head injuries is not taking proper measures like wearing helmet.In this regard we like to make it mandate for every bike rider to wear the helmet which may result in the decrease of death toll and saves lives of people. So, to implement this idea, a communication interface is been developed between bike and the helmet which works on the programme that is been dumped in to it. The program dumped in to it is written in embedded C and keil software is used in dumping the programme in to hardware.

The next important thing to note here is many people are driving while drunk which is harmful and its also violating laws. So as to prevent drunk and drive cases, with the help of the communication interface that's been developed in the system helps in detecting the alcohol content in the breathe of the bike rider. This helps in unabling the bike rider to ride the bike by not igniting the bike.

If at all the person who is driving met with an accident, without any external source the system itself sends messages to the ambulance, police and respective family members that the status of their ward is sent along with the location. This helps in fast response in the needed time, can save a life.Bike rider may not drive in the same places all the time. In the advent of new places the system gives a buzzer as an indication in the places like danger prone areas and all where to go in slow in order to prevent

accidents. The system used is made up of the simple components which are easily available in the market. Microprocessor, ADC, Alcohol sensor, Tilt sensor, GPS and GSM modules are used.Programming is done in keil written in embedded C language which is dumped in to the hardware. Proteus is used for circuit designing.

III BLOCK DIAGRAM

This paper mainly deals with reduction in death toll and also rate of accidents happening due to two wheelers. Finally the bike will not ignite in cases of not wearing a helmet and in drunken state and will alert the bike rider not to drive so rash where it is dangerous and helps in communicating with the external world when met with an accident.The project consists of two main blocks that are Receiver section and the Transmitter section. Receiver section is embedded within the bike and transmitter section is built in the helmet.
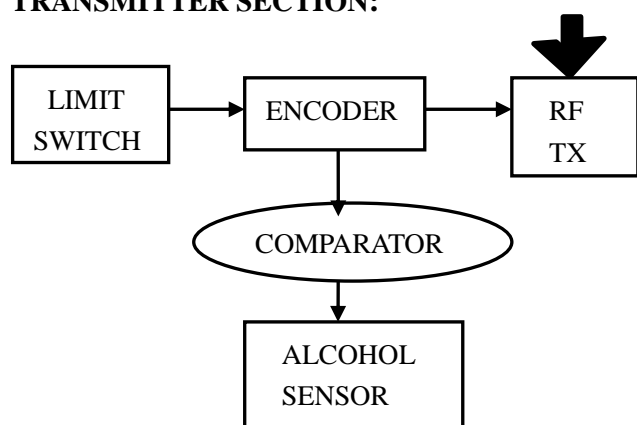
TRANSMITTER SECTION:

Figure 1: Transmitter unit in helmet

The transmitter section consists of a limit switch, an encoder, RF transmitter, comparator and an alcohol sensor. Limit switch sends an signal to the RF transmitter through encoder which is decoded in the receiver section.

Alcohol sensor contains a comparator which compares the values that are saved and to the current values and sends a signal to RF transmitter through encoder. The whole transmitter section is embedded within the helmet. Limit switch is placed in the top most part of the helmet which recognizes the status of the helmet.

RECEIVER SECTION:

The receiver section consists of a tilt sensor, ADC, decoder, RF receiver, driver, relay, max232, GSM and GPS modules and Microprocessor.Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits' etc. While these circuits require around 10milli amps to be operated, the microcontroller's pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.
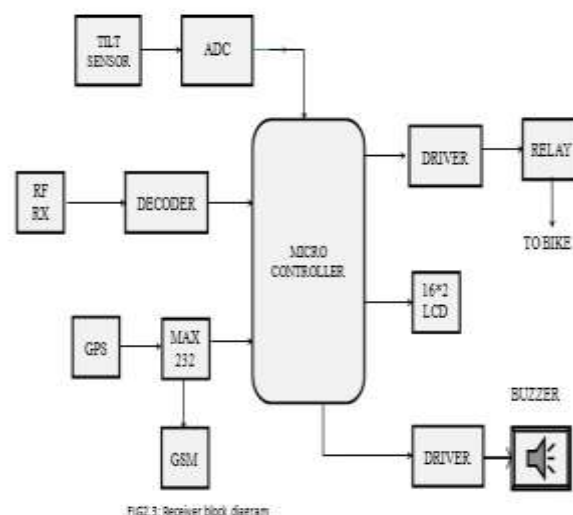

FIG2.3: Receiver block diagram

Figure 2: Receiver unit on bike

III CIRCUIT DIAGRAM:

Controlling is done wirelessly through RF transmitter and receiver modules embedded with helmet and bike. RF transmitter in helmet sends signals to RF receiver and so the information is given to micro-controller and then function is processed. The system then responds accordingly and display output is shown on 16*2 LCD used. Compatible with MCS-51™ Products 4K Bytes of In-System Reprogrammable Flash Memory Endurance: 1,000 Write/Erase Cycles Fully Static Operation: 0 Hz to 24 MHz. Three-level Program Memory LocK.
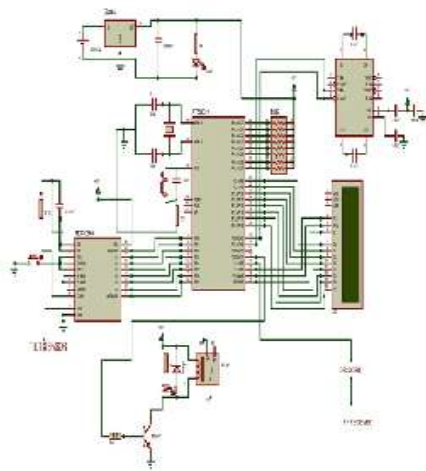
Figure 3: Circuit Diagram

IV WORKING:

The project involves with the transmitting and receiving of information between the helmet and the bike. The whole transmitter system is within the bike and the receiver system RF Module is embedded with the bike. By enabling a limit switch in the top position of the helmet when the person wears the helmet then the limit switch comes in to ON position and then transmits it to the RF module and after that relay comes in series with the key ignition and then bike will be started. When a person is drunken state then the alcoholic sensor (MQ3) that is been adjusted at the mouth area of the helmet senses the alcohol breathe and will not let the bike to start. Here we are using a microcontroller (AT89S52) that is used for maintaining a data base which helps in sending messages to the contacts that are already saved in it and also for maintaining a data base furnished with the information like Accident Prone areas, school zones and other slow driving zones all over India which consumes only kilobytes of data. When the person met with an accident then the accelerometer Sensor which is also called as accident sensor (ADXL335) gets activated and then sends the message to the respective contacts based in the list saved with the help of GSM SIM 300 along with tracking the location of the accident with the help of GPS tracking system.

Bike ignites when helmet is worn .When helmet is worn the limit switch is ON a signal from the RF transmitter and is send to the RF receiver , the signal will be feed to the relay . The relay is connect to the bike ignition point and an output will be shown in LCD as H1 and bike will ignites. If the helmet is not worn then H0 will be displayed in LCD , the bike will not ignites. Even if helmet is worn and a person is in drunken state , the bike should not ignite.
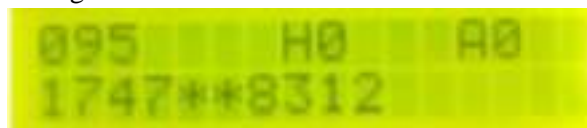
By using the Alcohol sensor(MQ3) if the person has consumed the alcohol. By the breath of the person, the sensor will senses it and sends a signal to the micro controller and it will no allow the bike to ignite and a message will send to the family as (D alert). The output in the LCD will be shown as A1 and if alcohol is not consumed as A0 and the will ignites.
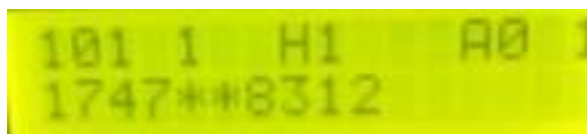
If bike rider meets with an accident , the tilt sensor has a range it exceeds the it indicates the person had meet with accident and signal is send to the micro controller .A message send to the family through GSM as(A alert) and with the help of GPS we can know the location in the form of latitude and longitude.
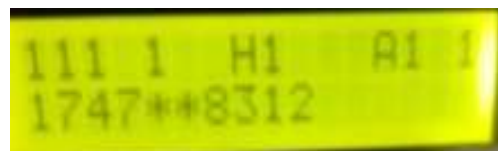
V ADVANTAGES:

If the person is in drunken condition, the person should not drive the bike but most of the persons are driving their bikes in drunken condition. So, we introduced an alcohol sensor which will senses the alcohol and bike will not start.

If person meet with accident by using tilt sensor , GPS , GSM a message will be sent to the ambulance and family for the quick rescue of the person.

By using the modules we can easily track the person who is wearing the ingenious armor helmet during the accident and prevent the person not to lose their life.

If we are in new place we don't know where the

turning , accident prone areas and school and hospital areas by using GPS , It will store all the area information and to make the person causation a buzzer is given , and helps the person to be careful and make them causation life from dangerous condition .

VI SOFTWARE DESCRIPTION

The µVision Simulator allows you to debug programs using only your PC using simulation drivers provided by Keil and various third-party developers. A good simulation environment, like µVision, does much more than simply simulate the instruction set of a microcontroller — it simulates your entire target system including interrupts, startup code, on-chip peripherals, external signals, and I/O.

This software is used for execution of microcontroller programs. Keil development tools for the MC architecture support every level of software developer from the professional applications engineer to the student just learning about embedded software development. The industry-standard keil C compilers, macro assemblers, debuggers, real, time Kernels, Single-board computers and emulators support all microcontroller derivatives and help you to get more projects completed on schedule.

You have made when you create your project target. You may select and display the on-chip peripheral components using the Debug menu. You can also change the aspects of each peripheral using the controls in the dialog boxes.

A unique features of the KeilµVision3IDEis the Device Database, which contains information about more than 400 supported microcontrollers. When you create a new µVision3project and select the target chip from the database, µVision3sets all assembler, compiler, linker, and debugger options for you. The only option you must configures the memory map.

VI CONCLUSION

The INGENIOUS ARMOR is mainly for the protection of the bike riders during the driving, it will not allow the bike to ignite if the person is not in good condition to drive the bike. And also there is a great support of communication interface between helmet and the bike (transmitter & receiver).

This project can be done in various other softwares which decreases the circuitry and is so comfortable to wear the helmet.
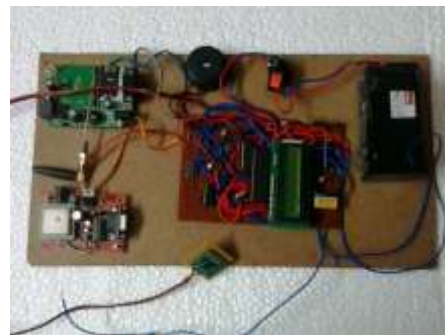
RESULT

Figure 4: Receiver unit

Figure 5: Transmitter unit

VII FUTURE SCOPE

In future we can develop the design with zigbee module for more security reasons which works for certain distance of communication only. If exceeds the range between transmitter and receiver there will be no communication and bike would not respond as per designed.

This project can be done in various other softwares which decreases the circuitry and is so; easy to install.

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