

Intelligent Skull Protector

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Abstract— A smarter helmet is an amazing gear which makes motorcycle driving safer in this era. This uses GSM and GPS technology. The working of this smart helmet is very simple; accelerometer is placed in helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense the directional change and gives to the micro-controller board, then controller extract GPS coordinates using the GPS module that is interfaced to it. When a rider meets with a microcontroller gets GPS location coordinates and send to the predefined numbers and hospitals.

Key words: GSM, GPS, Microcontroller, Accelerometer, Helmet

I. INTRODUCTION

In the era of globalization, we are privileged with technology to surmount the mishaps faced by the people all around the globe. It was surveyed in India, in 2014 1,39,671 people had severe injuries due to road accidents and lost their lives. There emerged a necessity to servile people on two wheeled vehicles by using helmets. Smart helmets with head-up display and rear facing camera were fangled by Marcus Weller termed as skully-AR1.

Being a part of the society it's a need to put up an idea, implement and create a prototype module easily Configurable to any helmet which is cost effective and can save many lives.

From this perspective we are working on this project to implement and Intelligent Skull Protector which is a helmet based on smart features consisting of GPS, GSM, ACCERLEROMETER and PEILTER MODULE. The basic prospect is, accelerometer will tell the Microcontroller that rider has met with an accident hence the Microcontroller will give a signal to GPS which will trace the location of the rider and GSM will send a message of riders location who met with an accident to 3 people i.e. 2 Family member and 1 to nearby ambulance for help. In the meanwhile, if a major harm is caused to the rider's brain the Peltier module will maintain the blood temperature of his/her brain so that no sudden death occurs as over flow of blood from brain due to unstable temperature is one of the major reason for sudden death.

II. PROBLEM DEFINITION

To design an prototype for helmets which will save lives of rider's when meet with an accident s with the help of GPS,GSM such that it will track the location & send an message to a family member & nearby hospital.

III. PROPOSED SOLUTION

In this system LPC 2148 microcontroller is used, when rider will wear the helmet a switch will make circuit active for the message sending. An accelerometer is used to sense the directions. When rider will fall after accident the values of

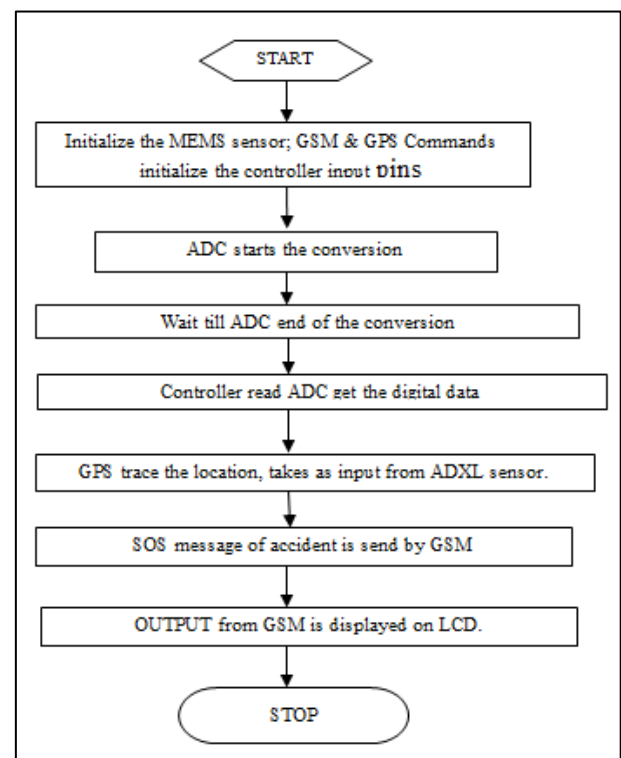
the accelerometer will change automatically which will be sensed by microcontroller. After sensing the above or below threshold values microcontroller immediately gets Location Coordinates of the latest updated location from the GPS. That location where the rider met with an accident and This information will be sent to a mobile number through a message. This message will be received using GSM modem present in the circuit. The message will give the information of longitude and latitude values. Using these values the position of the vehicle can be estimated.

To run the GPS and GSM module, microcontroller is a very user friendly device which can be easily interfaced with any sensors or modules.

Now some of the thoughts in our mind, how will send the SMS using the GSM module by keeping the GPS location in the SMS which is obtained from the GPS module. But when should all this is done? When accident occurs, how will the microcontroller detect the accident? This can be done by using accelerometer which is placed in the helmet.

The Accelerometer is placed in the helmet such that it detects Direction of orientation of the helmet. When the rider crashes, the helmet hits the ground and the direction of the rider's head changes and detect the accident occurrence and it will send an SMS containing information about the accident and location of accident using GSM and GPS modules. A active helmet switch is used which will make circuit active only when helmet is worn.

IV. FLOWCHART OF SYSTEM



V. SOFTWARE DESIGN

Software design is an integral part of this paper. Once the rider meets with an accident the ADXL will detect it and send a signal to GPS the GPS will detect the location and will send it to GPS the GSM will then send a message to a family member and nearby hospital. Following algorithm describes the software design of the system in brief.

ALGORITHM

VI. HARDWARE DESIGN

The general block diagram is shown in figure 1

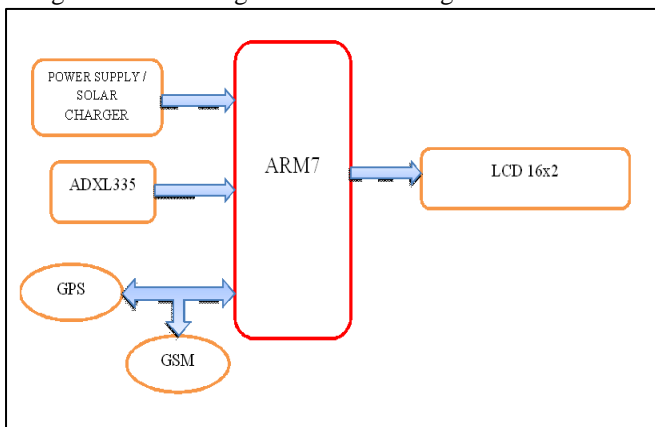


Fig. 1: Block Diagram of System

A. Microcontroller

Increasingly, embedded systems developers and system-on-chip designers select specific microprocessor cores and a family of tools, libraries, and off-the-shelf components to quickly develop new microprocessor-based products and applications. ARM is one of the major options available for embedded system developer. Over the last few years, the ARM architecture has become the most pervasive 32-bit architecture in the world, with wide range of ICs available from various IC manufacturers. ARM processors are embedded in products ranging from cell/mobile phones to automotive braking systems

B. GSM

This is an ultra-compact and reliable wireless module. The SIM800A is a complete Dual-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications allowing you to benefit from small dimensions and cost-effective solutions. Featuring an industry-standard interface, the SIM800A delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. With a tiny configuration of (24mm x 24mm x 3 mm), SIM800A can fit in almost all the space requirements in your applications, especially for slim and compact demand of design.

C. ADXL335

An Accelerometer is a kind of sensor which gives an analog data while moving in X,Y,Z direction or may be X,Y direction only depends on the type of the sensor. Here is a small image of an Accelerometer shown. We can see in the image that there are some arrows showing if we tilt these sensors in that direction then the data at that corresponding pin will change in the analog form.

D. GPS

The hardware interface of the SIMCOM module SIM28ML which can be used as a standalone or A-GPS (Assisted Global Positioning System) receiver. As a wide range of applications can be integrated in SIM28ML, all functional components of SIM28ML are described in great detail.

VII. CONCLUSION

Most of the rider prefers wearing helmet while riding. People who have Riding as a hobby follow all the protocols and rules. According to statistical report most of the deaths are caused due to the late medication of the person met with an accident. So to overcome this problem we designed a system which sends a quick alert about an accident. The alert message also contains GPS coordinates of the rider's current place, which helps to track exact location and makes it easy to provide the emergency help.

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REFERENCES

- [1] "Smart Helmet Using GSM & GPS Technology for Accident Detection and Reporting System" by Manjesh N, Prof. Sudarshan Raj International Journal of Electrical and Electronics Research ISSN 2348-6988 (online) Vol. 2, Issue 4, pp: (122-127), Month: October - December 2014, Available at: www.researchpublish.com
- [2] "Safety using Road Automated Wireless Communicating Smart Helmet Application (SURACSHA)" by Chinmoy Kulkarni & Rohit Somwanshi International Journal of Engineering Research & Technology (IJERT), IJERT ISSN: 2278-0181, IJERTV3IS091021 (This work is licensed under a Creative Commons Attribution 4.0 International License.) Vol. 3 Issue 9, September- 2014 www.ijert.org
- [3] "Smart Helmet" by Kajal Thakre, Pranali Waskar Pooja Sawant, Suchita Naik, Sumita Chandak ISSN: 2277 128X International Journal of Advanced Research in Computer Science and Software Engineering Volume 5, Issue 2, February 2015 www.ijarcse.com
- [4] "Smart-tec Helmet" by R. Prudhvi Raj, Ch. Sri Krishna Kanth, A. Bhargav Aditya and K. Bharath Advance in Electronic and Electric Engineering. ISSN 2231-1297,

Volume 4, Number 5 (2014), pp. 493-498 © Research
India Publications
<http://www.ripublication.com/aeee.htm>

- [5] "A Solar Powered Smart Helmet With Multifeatures"
by Mr.P.Dileep Kumar, International Journal of
Engineering Inventions e-ISSN: 2278-7461, p-ISSN:
2319-6491 Volume 4, Issue 10 [June 2015] PP: 06-11

