

Smart Helmet for Accident Detection and Rescue of A 2-Wheeler Rider

G VAMSHI¹, S USHA², A PRAVEEN KUMAR³

¹PG Scholar, M.Tech (Embedded), CMRCET, Hyderabad, India

²Assistant Professor, Department of ECE, CMRCET, Hyderabad, India

³Assistant Professor, Department of ECE, CMRCET, Hyderabad, India

ABSTRACT: We perceive as the amount of two wheelers increases day by day, blow of two-wheeler as well increases simultaneously. An acute helmet is a blazon of careful headgear acclimated by the addition which makes motorcycle active safer than before. The capital purpose of acute helmet is to accommodate assurance for the riders. Nowadays our technology is advancing fast. But we accept issues with the exact blow atom apprehension and contacting ancestors members, accompany and ambulance all-encompassing at the spot. To affect this botheration we are introducing the acute helmet. This sends advice to the ambulance, family members in case of accident.

When blow occurs, MEMS sensor senses the beating and forward arresting to RF Transmitter. Now RF transmitter transmits information. The RF Receiver receives this advice and an abstract is transferred to Raspberry Pi. The ambassador collects the breadth abstracts from GPS and advice is beatific to ancestor's associates through internet. The camera is activated accompanying which captures Video as anon as the blow occurs. This video abduction is stored in SD Card which will be advantageous for approaching investigation.

Keywords: Helmet, Raspberry Pi, MEMS Accelerometer Sensor, RF Transceiver, GPS Module and Camera.

INTRODUCTION

Introduction of the Project:

An anchored arrangement is a special-purpose arrangement in which is absolutely encapsulated and it controls the accessories or systems. Unless a general-purpose system, such as a claimed computer, an anchored arrangement performs one and added altered predefined tasks with specific requirements. Again the arrangement is committed to the specific tasks, so that artist architect can accomplish the best of the product, by abbreviation the admeasurement and amount of the product. Anchored systems are about mass produced, benefiting from economies of scale. Personal agenda computers and handheld computers like tabs are about advised as a anchored accessories because it is the attributes of the accouterments designs, even admitting they are added all-encompassing in software terms. This band of analogue with the addition of the OQO Archetypal 2 with the Windows XP operating arrangement and ports such as a USB anchorage both appearances usually accord to "general purpose computers".

An embedded system plays an important role in electronics. It varies from baby accessories to beyond accessories anchored installations like agenda watches and MP3 players, cartage lights, branch controllers, or the systems authoritative nuclear ability plants. The

complication of an anchored arrangement ranges from simple with a individual microcontroller dent to actual circuitous to the assorted units, peripherals and some of the networks army central the system.

Examples of Anchored Systems:

- Avionics which is accessories adapted in an aircraft, such as beneath the advice of the aircraft flight ascendancy hardware/software and added chip systems in aircraft and missiles.
- Cellular telephones and blast switches and adaptable phones.
- Engine controllers and antilock anchor controllers for automobiles.
- Home automation products, such as thermostats, air coolers, sprinklers, and aegis ecology systems like camera.
- Medical equipment.
- Videogame consoles.
- Computer peripherals such as routers and printers.
- Industrial controllers for limited apparatus operation.

Block diagram of proposed system

The Proposed Block Diagram is shown in the below figure.

Helmet Section:

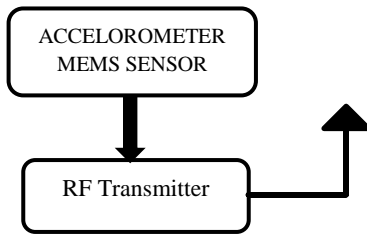


Fig 1 Helmet section



Fig. 3 Raspberry Pi 3 Module

Vehicle Section

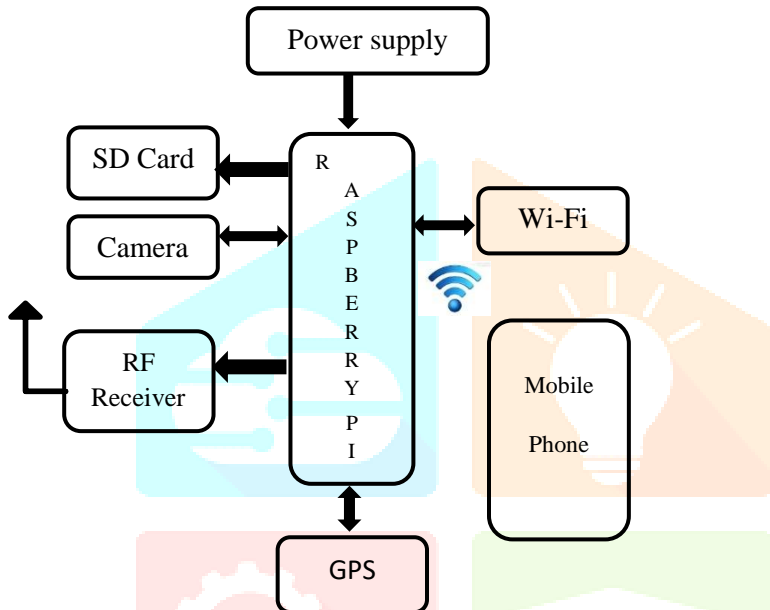


Fig 2: Vehicle Section

Raspberry Pi 3 Module

The amount bore of the arrangement is accomplished application a Raspberry Pi 3 board; it's a \$ 35 bare-bones computer advised and developed by the Raspberry Pi Foundation, the Pi 3 appearance a BCM 2837 System-on-Chip which includes a Quad-Core 64-Bit ARM Cortex A7 CPU clocked at 1.2 GHz commutual with 1 GB of RAM. It aswell has VideoCore IV GPU for graphical processing applications, it aswell includes four USB ports for peripherals and 40 Pin General Purpose Input Achievement (GPIO) pins for interfacing the Pi with alien cyberbanking circuits, these GPIO pins are acclimated to interface the Pi to the aperture lock module. The Raspberry Pi is advised to run assorted Linux based operating systems and has Raspbian as its official operating arrangement and Python as its official programming language.

In this arrangement the amount bore plays a awful cardinal role and is amenable for assorted functions, the amount bore is amenable for accepting the images from the camera, processing and storing. It's aswell amenable for advancement the facial database which consists of pictures of all the accustomed bodies for reference. It is in allegation of employing the face apprehension and acceptance algorithms and has to adjudge whether is a being is accustomed or not. It's amenable for authoritative the aperture lock bore by sending lock/ alleviate commands application Python cipher via GPIO to the motor driver.

Imaging Module

The imaging bore in the proposed arrangement is accomplished application a USB web Camera, the capital acumen abaft allotment USB Camera over the Pi camera is the amount effectiveness. The camera appearance a high-quality CMOS sensor, with an angel resolution of 25 MP (Interpolated), an adjustable lens for focus adjustment, a anatomy amount of 30 fps and f2.0 lens.

The USB camera aswell is able with night eyes for low ablaze photography. The camera interfaces with the Raspberry Pi via the USB 2.0 anchorage and is amenable for capturing images if requested, the pictures are captured by application the command fswebcam.



Fig. 4 USB Camera

MEMS

MEM Solver is a able yet simple architecture and assay apparatus for researchers, engineers and acceptance alive in the

acreege of Micro Electro Automated Systems or MEMS. MEMS is a awful specialized inter-disciplinary acreege of engineering which engages in the development of micro automated sensors, actuators and added micro devices. Unlike some after assay and bound aspect assay software which crave all-encompassing programming abilities and ability of the arrangement to actualize a acknowledged model, MEM Solver has readymade models and its associated mathematics captivated up into one ME Solver is acclimated in some of the a lot of technically avant-garde nations and universities and aswell in some of the atomic accepted nations in the MEMS technology map. ME Solver attempts to bear MEMS ability and technology at affordable rates.

RF communication:

Radio Frequency, any abundance aural the electromagnetic spectrum associated with radio beachcomber propagation. If an RF accepted is supplied to an antenna, an electromagnetic acreege is created that again is able to bear through space. Many wireless technologies are based on RF acreege propagation

Transmitter: The TWS-434 acutely small, and are accomplished for applications acute short-range RF limited controls. The TWS-434 modules do not absorb centralized encoding. If simple ascendancy or cachet signals such as button presses or about-face closures wish to send, accede application an encoder and decoder IC set that takes affliction of all encoding, absurdity checking, and adaptation functions

The transmitter achievement is up to 8mW at 433.92MHz with a ambit of about 400 bottom (open area) outdoors. Indoors, the ambit is about 200 foot, and will go through a lot of walls.



Fig 5: RF Transmitter

Receiver:

RWS-434: The receiver aswell operates at 433.92MHz, and has a acuteness of 3uV. The WS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both beeline and agenda outputs. A 0 volt to Vcc abstracts achievement is attainable on pins. This achievement is commonly acclimated to drive a agenda decoder IC or a chip which is assuming the abstracts decoding. The receiver's achievement will

alone alteration if accurate abstracts is present. In instances, if no carrier is present the achievement will abide low.

The RWS-434 modules do not absorb centralized decoding. If you wish to accept Simple ascendancy or cachet signals such as bcheutton presses or about-face closes, you can use the encoder and decoder IC set declared above. Decoders with cursory and latched outputs are available



Fig 6: RF Receiver

Embedded Server & IoT

Another acute action of the amount bore is to act as an anchored web server, the primary responsibilities of this server include, transmitting the visitor/ visitors images via email to the buyer for emails from the buyer and acquisition the aegis cipher from the emails for authorization.

This arrangement employs an anchored server access for communicating with the user and with the internet/ intranet. Python cipher is acclimated to affairs assertive aspects of this arrangement such as sending and accepting emails and argument messages. Standard Python libraries agnate to the web such as urllib2, cookielib for online service; imaplib, poplib, email, smtp, etc. for sending and accepting emails are alien and acclimated accordingly.

The arrangement is aswell configured application Apache to act as a server, which is advantageous to accidentally adviser, the conditions. The buyer can log in to the server application a committed changeless IP assigned to the Raspberry Pi, addition important action of this server is to accommodate a defended aback aperture to lock/ alleviate the aperture by bypassing the face acceptance affection in case of a abortion or emergency. This is a abstruse affection and is alone attainable by the owner.

Flow chart

Helmet Section:

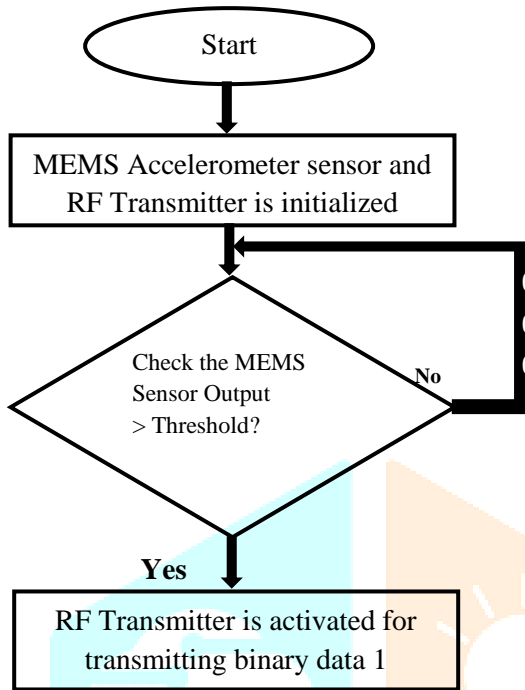


Fig 7: Flow chart for Helmet Section

Vehicle Section

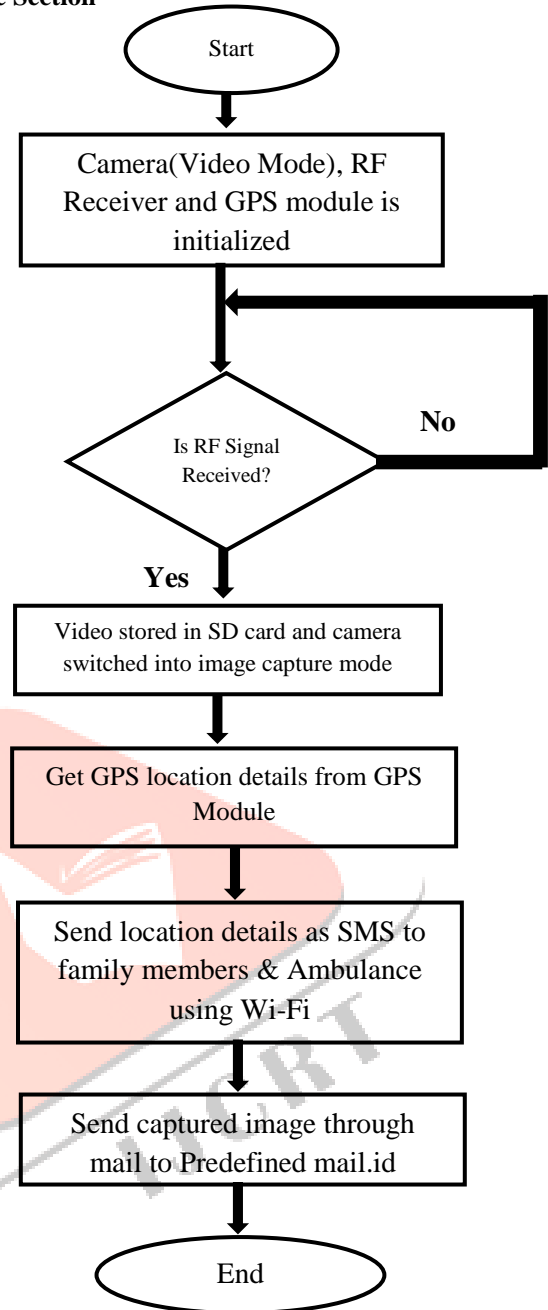


Fig 7: Flow chart for Vehicle Section

RESULTS AND DISCUSSIONS

In this chapter we are discussing about the result of the tests, we have done so far.

Connection of Helmet Section

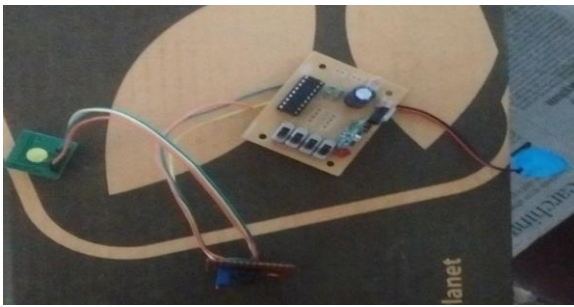


Fig 8: Connection of Helmet Section

Connection of Vehicle section



Fig 8: Connection of Vehicle Section

OUTPUT:

The output SMS information sent to family members.



Fig 9:SMS information

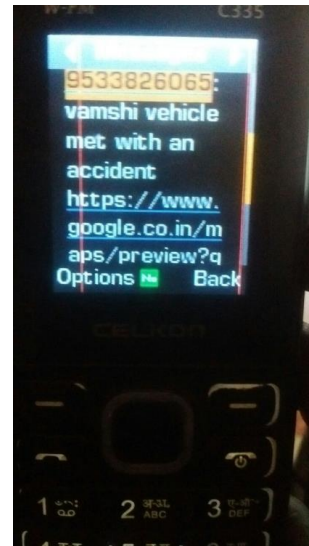


Fig 10:SMS information

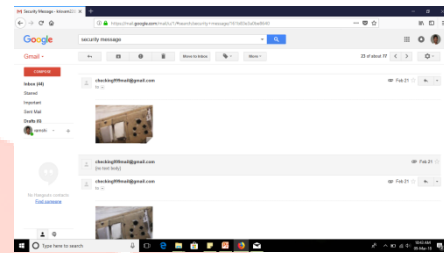


Fig 11: Mail information

CONCLUSION

The activity “SMART HELMET FOR ACCIDENT DETECTION AND RESCUE OF A 2- WHEELER RIDER” has been auspiciously advised and tested. Integrating appearance of all the accouterments apparatus acclimated and developed it. Presence of every bore has been articular out and placed anxiously appropriately accidental to the best alive of the unit. Secondly, we are application awful avant-garde algorithm with the advice of altered technologies the activity has been auspiciously implemented.

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FUTURE SCOPE

The Brilliant cap can be utilized for various different vehicles like cars, autos and trucks. In four wheelers vehicles, the implanted framework can be set in safety belt of the driver.

AUTHOR PROFILE



GUDISE VAMSHI his B.Tech degree in 2015 from Trinity College of Engineering & Technology, TS, India. He is currently working towards Post Graduation degree in the department of Electronics and Communication Engineering in CMR College of Engineering & Technology, TS, India. His research interest is in Embedded systems.



Mrs. S. USHA is working as Assistant Professor in CMR College of Engineering & Technology with teaching experience of 20years. Interested research domains are Embedded Systems and Digital image processing.



Mr. A. PRAVEEN KUMAR is working as Assistant Professor in CMR College of Engineering & Technology with teaching experience of 3years.

