

# Iot Based Accident Prevention System at Hairpin Bend

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Submitted: 05-06-2022

Revised: 17-06-2022

Accepted: 20-06-2022

**ABSTRACT:**Accidents are the most important challenge faced in today's World, particularly withinside the hilly vicinity in which there may be a loss of caution machine inflicting foremost casualties. Million Death Study states 1.2 million human beings demised withinside the presumed risky roads within the hilly regions. It is growing at an alarming rate, in account of this, inhibitory measures are prepared to shape a twist of fate prevention machine to lessen the quantity of injuries which are taking vicinity close to the hair pin bends. After taking the survey from truck drivers and travelers, the foremost troubles they may be dealing with are identified. They find it difficult to view the sort of automobiles that are drawing close on the alternative facet. If the car functions in excessive velocity, it receives toughness to govern the car and it will increase the probabilities of falling off the cliff. The foremost goal of this paper is to save injuries withinside the hair pin bends on the hill stations. In the accident prevention Hill station model, image capturing and IOT has been used to record the motion of automobiles coming from each aspects and shows it withinside the shape of picture along with some information using Blynk app. The notifications can be received by collecting the data stored in cloud using Blynk IOT software.

**KEYWORDS:** RPI, Image processing, Tensor flow, Accelerometer.

## I. INTRODUCTION

An exponential boom in transportation and automobiles has caused several injuries. According to a survey, car crashes on hairpin bends have 10% of entire visitors crashes. It is tough to drive in Such hilly regions having risky roads and curved segments. Hence, the advanced module shows a version with the aid where drivers can

nicely take turns in those sort of roads with none twist of fate taking vicinity. Hence, an IOT based system is developed to twist the fate by signifying the motion of automobiles withinside the blind spot in which there may be no clean visibility of automobiles coming from the other facet to save from injuries. In traditional methods, Convex mirrors are positioned at each turnings of the U-pin bend. It suggests whether or not the car is arriving from the other side. After viewing the replicate, the drivers decreases their velocity making way for the alternative car to move with out crashing. The drawbacks of setting convex mirrors might be inefficient because of the inclement climate withinside the hilly regions. It is difficult to predict the climate change and are often blanketed with fog and mist hiding the visibility of the replicate within the blink of an eye. Another approach is the use of car horns. When drawing close the hairpin bend, drivers commonly use the horn to signify their presence. They decide the space with the aid of using its depth of honking sound. It creates extra noise withinside the surrounding region inflicting confusion amongst drivers.

## II. ACCIDENT PREVENTION HILL STATION MODEL

IOT is a blooming Technology which offers wireless network and computing. To access certain information using IOT, Raspberry pi is used for better connectivity. Sensors such as Vibration sensor, IR sensors, Accelerometer is built as an accident prevention system shown in fig-1.



**Fig-1: Component setup**

### RASPBERRY PI three B MODULE

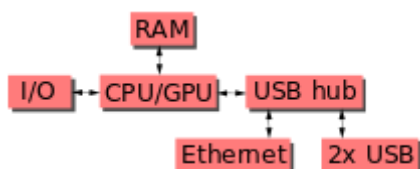
Raspberry Pi is a chain of small single-board computers (SBCs) advanced within the United Kingdom with the aid of using the Raspberry Pi Foundation in affiliation with Broadcom. The Raspberry Pi assignment initially leaned in the direction of the promoting of coaching primary pc technology in faculties and in growing countries. The unique version have become extra famous than anticipated, promoting outdoor. It's goal marketplace includes robotics. It is extensively used in lots of regions, which include for climate monitoring, due to its low cost, modularity, and open design. It is commonly utilized by pc and digital hobbyists, because of its adoption of HDMI and USB devices.

Raspberry Pi three Model B changed into launched in February 2016 with a 1.2 GHz 64-bit quad-middle ARM Cortex-A53 processor, onboard 802.11n Wi-Fi, Bluetooth, and USB boot capabilities.

The Raspberry Pi three Model B is the 0.33 era Raspberry Pi. This effective credit-card-sized single-board pc may be used for lots programs and supersedes the unique Raspberry Pi Model B+ and Raspberry Pi 2 Model B. Whilst preserving the famous board layout the Raspberry Pi three Model B brings you a extra effective processor, 10x quicker than the primary era Raspberry Pi.

### III. HARDWARE & PROCESSOR

The Raspberry Pi hardware has advanced via numerous variations that characteristic versions within the sort of the crucial processing unit, quantity of reminiscence capacity, networking support, and peripheral-tool support.



**Fig-2: Processor**

This block diagram(Fig-2) describes fashions B, B+, A and A+. The Pi Zero fashions are similar, however lack the Ethernet and USB hub additives. The Ethernet adapter is internally related to a further USB port. In Model A, A+, and the Pi Zero, the USB port is hooked up without delay to the machine on chip (SoC). On the Pi 1 Model B+ and later fashions the USB/Ethernet chip incorporates a five-port USB hub, of which 4 ports are available, at the same time as the Pi 1 Model B simplest affords two. On the Pi Zero, the USB port is likewise related without delay to the SoC, however it makes use of a micro-USB (OTG) port. Unlike all different Pi fashions, the forty pin GPIOconnector is neglected at the Pi Zero, with solderable via-holes simplest within the pin locations. The Pi Zero WH treatments this. Processor velocity degrees from seven hundred MHz to 1.four GHz for the Pi three Model B+ or 1.five GHz for the Pi four; on-board reminiscence degrees from 256 MB to eight GB random get admission to reminiscence (RAM), with simplest the Raspberry Pi four having extra than 1 GB from the fig-3. Secure Digital (SD) playing cards in MicroSD shape factor (SDHC on early fashions) are used to save the working machine and software reminiscence.



**Fig-3: Raspberry pi 3**

### PI CAMERA MODULE

The 8MP Raspberry Pi Camera Module v2 can be used to take high-definition video, as well as stills photographs. It uses high quality 8-megapixel Sony IMX219 image sensor custom designed add-on board for Raspberry Pi, featuring a fixed focus lens. It is capable of 3280 x 2464-pixel static images, and also supports 1080p30, 720p60 and 640x480p60/90 video.

### ACCELEROMETER

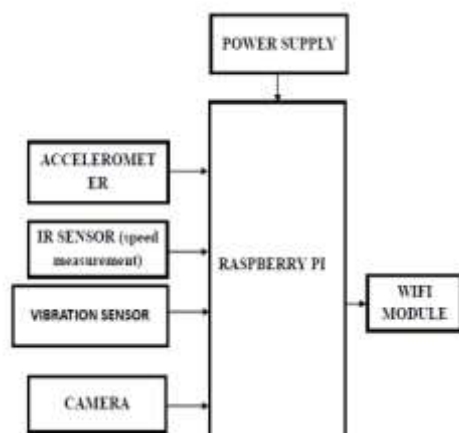


**Fig-4: Accelerometer**

Ever wondered how smartphone knows up and down! It's one of the coolest features of today's smartphones. They all got a tiny device called Accelerometer built into the circuitry which can sense when tilted it from side to side. That's how smartphone automatically figures out when to switch the screen layout from portrait to landscape. Accelerometer is shown in the fig-4.

For the PI to paintings it's far obligatory to put in OPERATING SYSTEM.

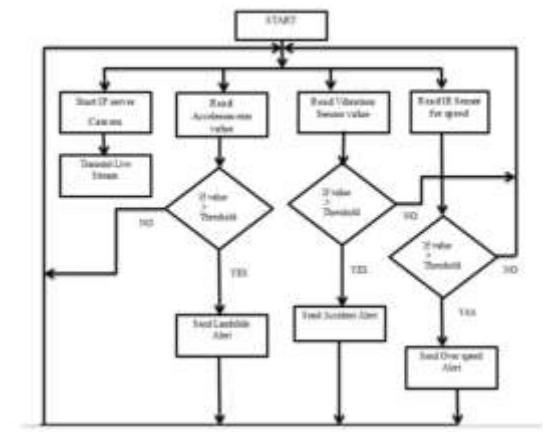
- The OS software program is downloaded in a SD reminiscence card.
- SD card is inserted in PI board.
- Connected it to the monitor, keyboard and mouse
- The board may be powered with the aid of using micro-USB connector
- The PI begins offevolved to run with the aid of using the OS gift withinside the reminiscence card.



**Fig-5: Block diagram**

At first, the digital digicam detects the vehicle while it passes the street in which the digital digicam is positioned on the perimeters of the street shown in fig-5. The digital digicam captures the upward and downward shifting vehicle's picture and detects it's sort. In the

raspberry pi three version B the code is uploaded. After the vehicle is captured, it's far despatched to raspberry pi in which the entry is studied with the aid of using pc imaginative and prescient. The output is given as the picture of the vehicle along side its type and it's far displayed at the LCD display screen positioned on the hairpin bend given in the fig-6. The assignment is primarily based totally on smart city, IOT and digital reality.



**Fig-6: Flow chart**

#### IV. RESULT & DISCUSSIONS

When a vehicle is detected by photo processing, it sends the facts and accesses the picture from the database. If it suits with the database, it presents the picture at the LCD screen. This challenge is to save injuries inside the hair pin bends at the hill stations. Image capturing approach has been used to track the motion of vehicles coming from both facets and showing it. presently the following methods are being used, Convex mirrors were placed at point of the bend in the street in order that the motive force ought to see whether some other automobile is coming from the opposite side or not which might not be clear in certain climate conditions. other manner is the use of vehicle horns. The drivers on both facets decide the space of one another by honking their horns and the intensities of sound from their respective horns. It creates more confusion and noise in the surrounding. The traditional approaches may be changed by IOT based accident prevention system and can be accessed using Blynk which is an IOT platform used to control Raspberry pi via the internet. This application creates a graphical interface by compiling and providing the address. Data is stored in cloud and can be accessed by Blynk.

## V.CONCLUSION

By the use of Image processing and caution machine, it's far feasible to discover exactly the sort of vehicle withinside the photograph with the assist of pc imaginative and prescient use of IOT. This assignment additionally affords experimental consequences for using extra efficaciously withinside the hilly regions to make certain protection and focuses mostly on the driver's safety. Accidents may be prevented by staying alert and attentive throughout the tough situations. Landslides, accidents and over speeding of vehicles is immediately sent to the nearby authorities and certain actions can be taken by them.

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