

Accident Prevention and Road Safety in Hilly Region using IOT Module

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Abstract - The sloping areas are more inclined to mishaps because of the sharp turns, unintentional bends and the vulnerability or newness of the street. Avalanches, floods, connect break, and so on aggravates the things. Travelers likewise, alongside the inhabitants deal with issues and endure because of the previously mentioned reasons. GPS/GSM frameworks additionally don't work as expected in these districts. The destination of the work is to reduce the mishaps in hairpin bends and to facilitate smooth and effective developments of vehicles, to prevent the noise pollution caused due to horn, to reduce the confusion of drivers at conflict points and to help people in emergency and provide the landslide alert. This paper examines a module which means to screen and improve the security in sloping regions by utilizing Wireless Sensor Network and Internet of Things. Remote sensing (WSN) utilizes self-controlled detecting gadgets at the areas delicate to previously mentioned reasons and afterward these sensors send data to the worker about the chance of a setback and accordingly giving an admonition sign to all so that ideal assistance can be given and the moves can be made to forestall the disaster or possibly decrease its outcomes.

Key Words: *Internet of Things; Road Safety; Wireless Sensor Network.*

I. INTRODUCTION

Street car crashes and passing's brought about by them are most basic issues now a days. It is additionally affecting the nation's economy. This show incorporates, significant issues like street mishap and their effects, reasons for this mishap, impact of mishap, avoidance and control that we can advance the present circumstance.[4] Additionally, it's anything but safe now a days to cross the ghat while having any long excursion. Level of mishap in ghat region is expanding step by step. Seriousness of this mishaps are non-reparable. [7] Road Traffic Accidents (RTA) are liable for million passing's worldwide every year. Along these lines, it is first imperative to control this situation and have some wellbeing measures in ghat region.[3] Dr. R. Adams Cowley in 1961, perceives that consultants will have a more unfortunate possibility of endurance on the off chance that they are not conveyed to decide the consideration inside one hour from season of mishap.[2] Generally, in the sloping spaces of Northern India (Uttarakhand) mishaps because of helpless advancement of public interstates and peril zones. In India the pace of mishaps in ghat area is expanding step by step. In India 1 out of 6 genuine casualty's kicks the bucket, yet in the U.S.A. the figure is 1:200.It will end up being the third biggest supporter

of the Global weight of the sickness. It is assessed that 60,000 are killed on the streets consistently.[5]

- Engineering measures.
- Enforcement of guideline.
- Educators of public in transit regulations.

Street plan, street lighting, atonement of the damaged vehicles taken to diminish the pace of mishaps. Speed control, traffic light, preparing and management, segment recognition of law and guideline and clinical examination of guideline. It is important to give instruction identified with transit regulations to teach the street client in regards to the essential security insurance taken while utilizing the street.[6]

The previous few decades, there's been huge blast in number of mishaps, wounds and passing per million populace of whole world. This is an aftereffect of ascent of engine vehicle populace, heterogeneous nature of traffic, absence of traffic division.[1] These days, number of vehicles is expanding on street unfathomably. Accordingly, street mishap and gridlock are a developing issue. Motivation behind our work is to research on improving street wellbeing application is a subject of enormous fixation. By imparting through remote organizations, security application can be utilized to stay away from mishaps.

II. LITERATURE SURVEY

Recognition of mishap utilizing piezoelectric sensor. The result was Emergency administrations with legitimate mishap data and help are given on schedule. [8] Keeping away from mishaps in clasp bends and hazy regions utilizing Critical hint framework .The Outcomes was Information trade between vehicles with respect to speed and distance is caught by the framework and the choice dependent on calculation is given to the vehicle by visual presentation. [3] Mishap prevention using Sensor framework the result was LED is set off in this manner focusing on the vehicles development. [4]Mishap aversion in sloping track utilizing Real time system. The result was System to distinguish exhaustion indications in drivers

and control the speed of vehicle to keep away from mishaps. [1] Help with slope side for street safety using piezoelectric sensors. The result was Altering the driver about the vehicle coming from inverse side. In the event that vehicle comes from one finish of the bend sensor faculties and LED light shines at the contrary side. By taking a gander at the LED light on/off standards driver can wake up and can hinder the speed of the vehicle. [2] Mishap anticipation utilizing Sensors, The result was driver will be alarmed about vehicles coming from inverse side. [7] Mishap counteraction in mountain roads utilizing Ultrasonic sensors. The result was number of mishap occurring in the bends of slopes have diminished as well as there is signal giving data that vehicles are coming from the contrary sides, thus adjusting.[6]

Mishap avoidance framework in bending utilizing Ultrasonic sensors. The result was Decrease the quantity of mishaps in bend streets by modifying the driver through LED light which sparkles when vehicle comes from the opposite side. [9] Mishap avoidance system using Vibration Sensor, LED, Ignition key, DC Motor, The result was Vehicle robbery anticipation utilizing the message, voice alarm, area and photograph choice.[15] In existing structure drivers can't judge which and when vehicles appear at twists. In this way, we have encouraged a model using which drivers can organize the curve and judge the presence of the vehicles from the far edge even more positively. Similarly as speed trap structure will help the authority with taking actions against the vehicle owner who upsets the rules.

Table 2.1: Accidents in Karnataka from the year 2014-2018

Year	Accidents Reported	Number of People Killed
2014	43,713	10,452
2015	44,011	10,856
2016	44,403	11,133
2017	42,542	10,609
2018	41,707	10,990

The table 2.1 shows number of accidents from the year 2014 to 2018. The quantity of fatalities expanded notwithstanding the plunge in the quantity of street mishaps. In 2018, a sum of 41,707 mishaps were accounted for in the State, contrasted with the 42,542 of every 2017. Karnataka has additionally dropped down in its positioning of mishaps from three out of 2017 to four out of 2018, enrolling a decrease in mishaps by 835 — about 2% over the earlier year. The State stayed at the fourth spot as far as mishap related passings and showed an increment in people killed by 381 — about 3.6%," states the report. Over the most recent five years, more than 54, 000 individuals were killed in street mishaps in the state.

III. PROPOSED SYSTEM

In our project we have proposed a calculation to stay away from mishap and to forestall clog in sloping regions and hair clip twists. In our proposed approach, implication will communicate quicker; thus it will be useful for vehicles to stay away from crash and furthermore for controlling gridlock. Likewise, we will actually want to help individuals struck in crisis and furthermore distinguish avalanches.

IV. SYSTEM DESIGN

The hardware requirements of our project are ATMEGA328P, IR Sensors, RFID, IOT Module and software requirements are Windows 10, Arduino IDE, Blynk app. ATMEGA 328P is a 8-bit microcontroller having 28 pins. It has a modified Harvard architecture 8-bit RISC processor core. An infrared (IR) sensor is an electronic gadget that actions and identifies infrared radiation in its general climate. Radio-frequency identification (RFID) utilizes electromagnetic fields to naturally recognize and follow labels joined to objects. A RFID framework comprises of a little radio transponder, a radio recipient and transmitter. The methodology of the proposed work to execution of a Collision Avoidance System in hair clip twists on a sloping track, Ghats, or no ability to see turns utilizing vicinity sensors.

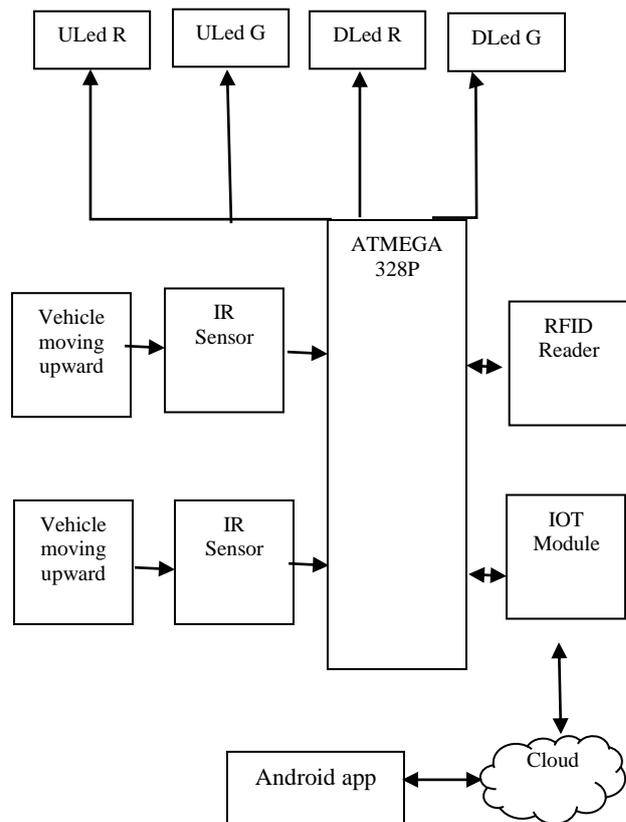


Fig: 5.1 Block diagram

It utilizes two IR sensors, which is put on the side of the fastener twist. One sensor is introduced by the side of the difficult segment of the street, correspondingly another sensor is introduced by the side of the declining part of the street. In view of the yield of sensors, position of vehicles on one or the other side of the twist is distinguished which is given as a contribution to the microcontroller. The microcontroller which chips away at force supply of 9V runs a Priority calculation which triggers the admonition LEDs to gleam and consequently wisely controlling the development of vehicles at the curve. Cautioning LEDs alongside an arched mirror are put at the focal point of the external bend of a barrette twist. Another LED is put in request to tell a framework breakdown. Too as we can carry out a ringer which will alarm the client. For speed trap we can calculate speed by the input from sensor and RFID to distinguish the vehicle. At whatever point a vehicle passes by the speed of the vehicle will be enlisted by the calculation this speed will be put away in information base over cloud and can be shipped off the approved individual for additional activities. An android application will be created for this reason and approved individual can have continuous updates over his telephone.

Fig.5.2 shows the flow of algorithm used to prioritize the movement of the vehicle while negotiating a hairpin bend. Sensors are initialized to start monitoring the vehicle movement. ULEDs are LEDs in uplink and DLEDs are LEDs in downlink having both red and green LED in uplink and downlink. Initially red LEDs will be in on state. Priority is given to vehicles climbing the curve in order to maintain their momentum. If uplink vehicle is detected then strobe lights for downlink will be red in on condition, green in off condition. If vehicle is detected in downlink then strobe lights green will be changed to on condition. If emergency button is pressed then notification will be sent. Rfid reader helps differentiating authorized and unauthorized vehicles.

V. RESULT AND DISCUSSION

The following figures show the results of our project.

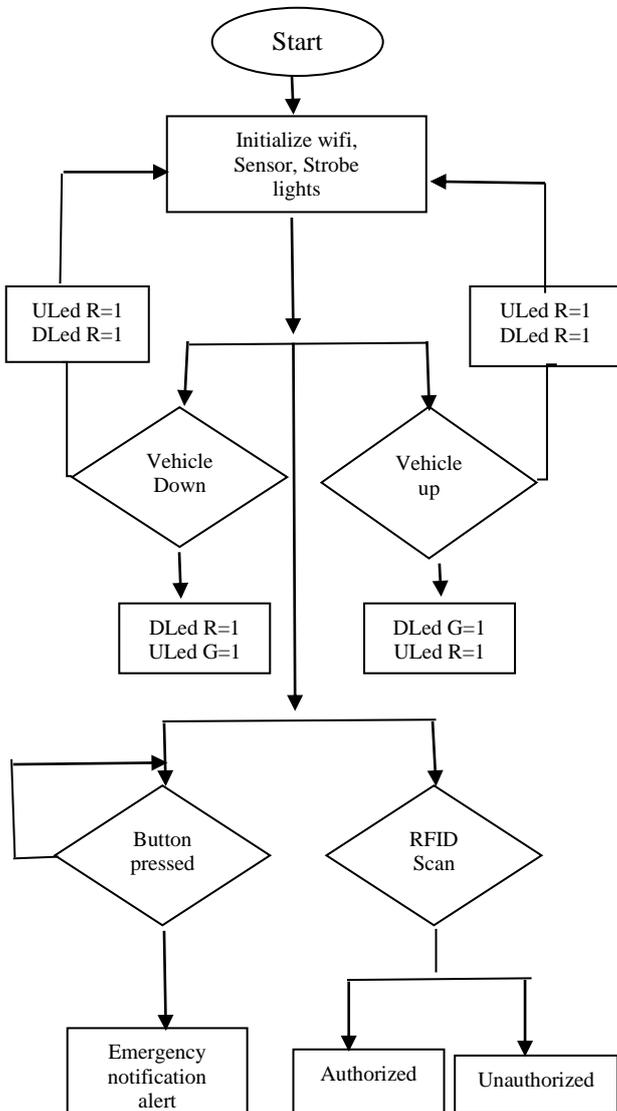


Fig: 5.2 Flowchart

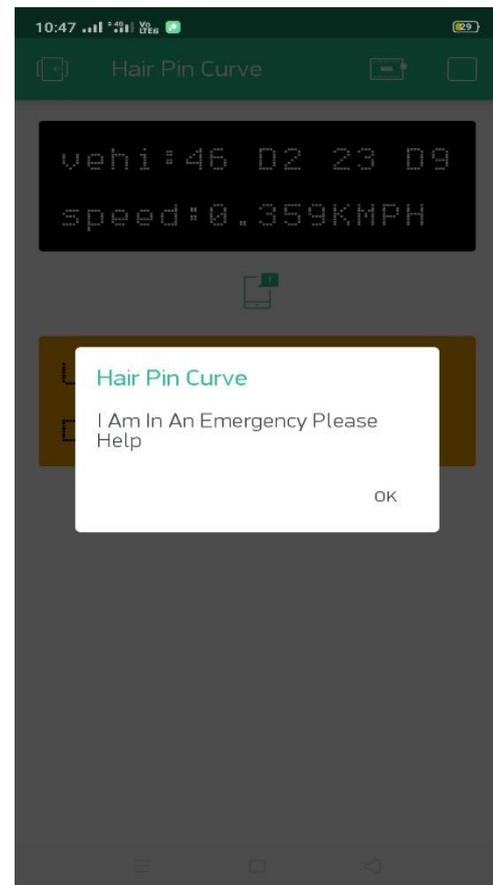


Fig: 6.1 Emergency notification

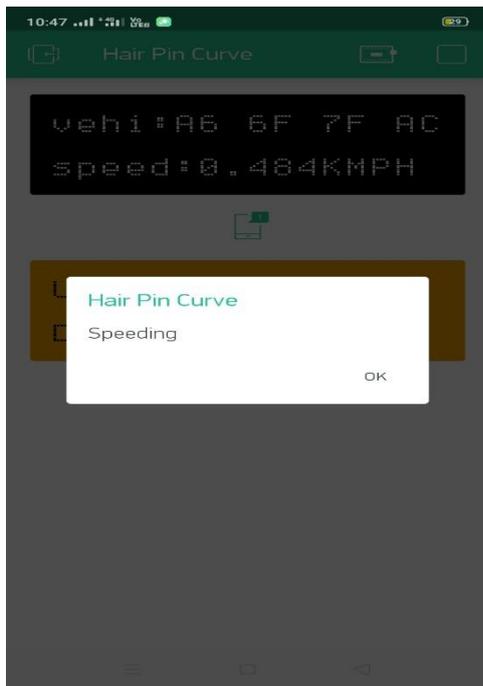


Fig: 6.2 Speed notification on display

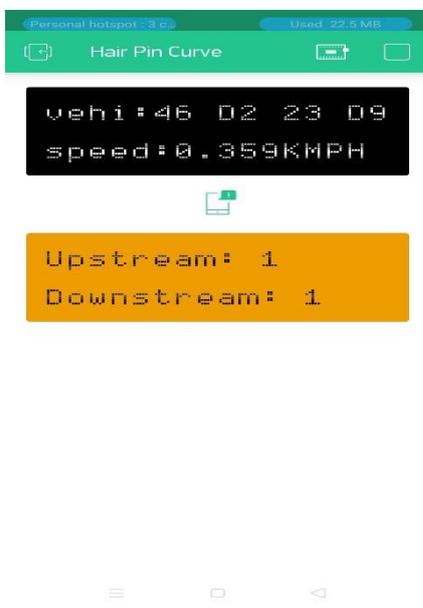


Fig: 6.3 Count of vehicle numbers.

VI. CONCLUSION

A fast development in transportation and vehicles have brought about an increment of mishaps consistently. Mishaps chiefly happen because of inconsiderateness, disrupting traffic guidelines and awful states of the street. As a significant part of street mathematical plan, bended street portion, because of their arrangement attributes are generally inclined to car accidents among all street mathematical components. As per

an overview, crashes on bended fragments represented 10% of absolute number of car accidents. Correspondingly, the quantity of passing's represented 13% of complete number of passing's. In Narrow streets, Hilly regions, Ghats segments, arranging clasp twists and bends is certainly not a simple assignment. Driver must be alarmed constantly while driving in such circumstances. Mishaps fundamentally happen due to over speeding of vehicle while passing through an abrupt bend. In Ghats and clip twists, first inclination ought to be given to vehicles moving uphill. However, rules are not stringently followed and subsequently bringing about streets squares and mishaps. In existing framework drivers can't judge which and when vehicles show up at bends. Subsequently, we have fostered a model utilizing which drivers can arrange the bend and judge the appearance of the vehicles from the opposite end all the more certainly. Just as speed trap framework will assist the authority with making moves against the vehicle proprietor who disrupts the guidelines.

This project can be upgraded later on by combination of AI for the tactile information part. Open CV can be utilized to make this idea work even in hazy or stormy conditions. By utilizing this, precision can be expanded up to 95%. Preparing rate will be little more slow contrasted with installed based framework however the Machine learning arrangement can handle huge datasets. Extra enhancements should likewise be possible like number plate identification, cost assortment and so forth.

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